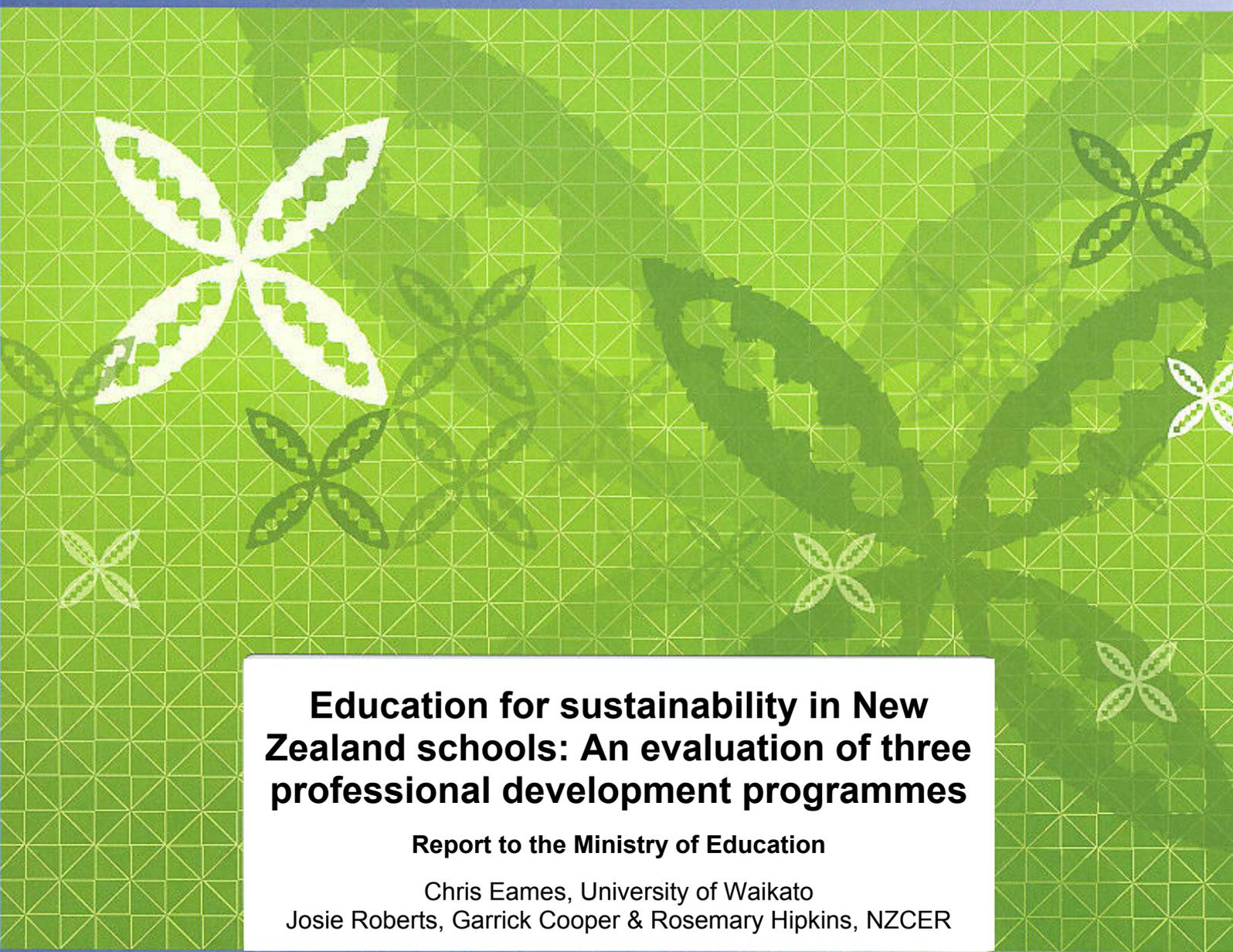




MINISTRY OF EDUCATION NEW ZEALAND

Te Tāhuhu o te Mātauranga Aotearoa



Education for sustainability in New Zealand schools: An evaluation of three professional development programmes

Report to the Ministry of Education

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Part One:

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Preliminary Note

Part One of this report provides an overview of the main findings for each initiative and examines what each contributes to EfS in New Zealand. The evaluation findings for each initiative appear in Parts Two, Three and Four.

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Executive Summary

This evaluation of three Education for Sustainability (EfS) professional development programmes—Enviroschools Programme, the National EfS Team and Mātauranga Taiao—was conducted between 2007 and 2009. The Enviroschools Programme is a community initiative funded jointly by local and central government focusing on community partnerships, sustainable school practices and student leadership/engagement. The National EfS Team is a School Support Services advisory group focusing on teacher pedagogy, curriculum development and student achievement/engagement. Mātauranga Taiao is a Māori-medium education professional development programme for kaiako and Resource Teachers in Māori, which focuses on co-constructing mātauranga taiao. The evaluation examined the intentions, processes and outcomes of each initiative against an analytic framework that drew on international and national conceptions of EfS.

Findings show that the initiatives are achieving: greater inclusion of sustainability content and more integrative teaching across the curriculum; the development of facilitative teaching styles that are empowering students to become strongly engaged in their learning and to think critically about issues; and the development of sustainable practices in schools and their communities. Challenges remain for: fostering EfS in large primary and secondary schools; building a strong local knowledge base in EfS; and developing a coherent education strategy for New Zealand EfS to help students learn for a sustainable future.

1. Introduction

This report provides an evaluation of three Education for Sustainability (EfS) professional development programmes funded by the Ministry of Education: the Enviroschools Programme, the National EfS Team and Mātauranga Taiao. The report summarises our evaluation findings and provides our conclusions and recommendations.

1.1 The programmes

The Enviroschools Programme began in Hamilton in the late 1990s as a local government initiative and now involves approximately 20 percent of all New Zealand schools. The Programme delivers EfS professional development support in schools through a local and regional structure funded by local government and supported by a national office. The national office is currently funded by the Ministry of Education.

The National EfS Team grew out of a professional development programme delivered around the introduction of the *Guidelines for Environmental Education for New Zealand Schools* in 1999 (Ministry of Education, 1999). The team constitutes a group of advisers and two co-coordinators who are located in School Support Services within six New Zealand universities.

Mātauranga Taiao began in 2007, and developed from a recognised need for targeted professional development in EfS in Māori-medium education. A national coordinator and two regional coordinators provide professional development for kaiako and Resource Teachers in Māori to enable them to foster EfS in Māori immersion programmes in kura and schools.

1.2 Background

“Education for Sustainability” (EfS) can be considered an enriched extension of what has previously been referred to in the New Zealand school sector as “Environmental Education” (EE). The recent shift in language from EE to EfS is significant, as it reflects a broadening of concern away from an educational approach that largely focuses on environmental and conservation issues, to one which integrates concerns for social, political and economic development, and addresses education for long-term ecological and social sustainability (Tilbury, 1995; Parliamentary Commissioner for the Environment, 2004). We now consider the international and national context of EfS as a background to evaluating the three initiatives.

1.2.1 International context

International literature regarding EfS in schools emphasises five central themes:

- Systems thinking recognises the need to take a holistic approach to examining problems and processes that seeks to understand the connections between various influences. It supports a focus on local and regional approaches to sustainability (Sterling, 2001).
- Transformational learning advocates the need for change towards more sustainable behaviour and promotes critical thinking to understand the underlying reasons or causes for our current relationship with the environment and encourages thinking and action towards a sustainable future (Jickling and Wals 2007; Sterling 2001).
- Whole-school approaches emphasise the need to engage the whole community in EfS and to participate democratically in education that empowers learners.

- Participatory action taking suggests that education must lead to an ability to act with knowledge and intention, to develop what is known as action competence, with reference to the environment and a sustainable future (Blanchet-Cohen, 2006; Jensen, 2002).
- Cultural inclusiveness promotes the incorporation of indigenous ways of knowing and doing in EfS, and recognises the interconnectedness of the world's peoples (Malone & Tranter, 2003; Tilbury & Wortman, 2005). Cultural inclusiveness indicates a uniquely New Zealand approach to EfS that supports inclusion of Māori perspectives as *tangata whenua*, and recognises the perspectives of all cultures in New Zealand.

International movements that also guided this evaluation include:

- *Agenda 21* (UNCED, 1992) that called for education for sustainable development in schools and to which New Zealand was a signatory.
- The *Decade of Education for Sustainable Development 2005–2014* (UNESCO, 2007), for which New Zealand is a signatory, which promotes interdisciplinary and values-based learning, critical thinking, participatory decision making and locally relevant actions.

1.2.2 National context

The following *Key Messages* for the Government's purpose in EfS were espoused in the Request for Proposals for this evaluation:

- Education is a key part of the Government's strategy to protect and enhance the environment.
- Education for Sustainability will have social, cultural, economic and environmental benefits for all New Zealanders.
- Education for Sustainability links to New Zealand's developing image of a socially and culturally inclusive society committed to protecting and enhancing our environment.
- Education for Sustainability requires effective partnerships between a range of government and non-government organisations.

These key messages are affirmed by the Ministry of Education's Statement of Intent 2007–2012 (Ministry of Education, 2007a) that recognises that education is "critically important" for New Zealand's long-term sustainable development, and that the Ministry of Education can support sustainable practices through influencing curriculum development (p. 17).

Other New Zealand documents which informed this evaluation include:

- Transition from *The New Zealand Curriculum Framework* (Ministry of Education, 1993) to *The New Zealand Curriculum* (Ministry of Education, 2007b).
- The *New Zealand Curriculum* includes sustainability as a future-focus theme, includes principles and values for sustainability and encourages schools to engage in their own curriculum design. These emphases provide a stronger message, and greater potential, for inclusion of EfS in schools than in the previous curriculum.
- The *Guidelines for Environmental Education in New Zealand Schools*, produced in 1999 (Ministry of Education, 1999), is the only current Ministry document supporting EE/EfS in schools. However, the *Guidelines* need updating to reflect changing international conceptions of EfS, the Ministry's change of emphasis from environmental education to education for sustainability and alignment to *The New Zealand Curriculum*.
- The Ministry for the Environment's *Learning to Care for Our Environment: Me Ako ki te Tiaki Taiao* (Ministry for the Environment, 1998) promotes development of sustainable behaviour through environmental education that fosters community participation and inclusiveness.

- The Parliamentary Commissioner for the Environment's (2004) *See Change: Learning and Education for Sustainability* calls for whole systems redesign that encompasses critical thinking and reflective learning, a future focus, participation and transformation.

1.3 Evaluation methodology

This evaluation took place between May 2007 and May 2009. The evaluation team focused on the individual and joint contributions of the three initiatives to EfS in New Zealand schools and kura. The questions that guided this evaluation were:

1. What are the key messages, goals and intended outcomes of school-based EfS and how does each initiative align with these?
 - What key motivations and developments have informed and supported the initiation and growth of these initiatives?
 - How have the goals and intended outcomes of each initiative aligned with or extended the “aims for Environmental Education” outlined in the *Guidelines for Environmental Education in New Zealand Schools* and other government guiding documents in school-based environmental education?
 - How do the goals and intended outcomes of each initiative align with or extend internationally-promoted and New Zealand governmental *Key Messages* for EfS in schools, and specifically New Zealand/Māori conceptions of sustainability?
2. How effective are the three initiatives in “operationalising” EfS key messages and achieving EfS goals in schools?
 - What and how do contexts, processes and practices support the achievement of EfS outcomes within each initiative?
 - To what extent have the initiatives achieved the goals and outcomes set out in their service agreements with the Ministry of Education?
 - To what extent do the EfS initiatives impact on: students’ learning opportunities, understanding and assessment of student learning outcomes in EfS; teaching practices, including pedagogical change; school-wide structures and curriculum development; and community partnerships and sustainability?
 - To what extent do the initiatives individually contribute to the achievement of EfS goals?
 - How do the three initiatives work together and complement each other to achieve EfS goals?
 - To what extent do the initiatives achieve outcomes suggested by wider literature and conceptions of Education for Sustainability (in comparison with Environmental Education)?
3. What are the future directions for school-based Education for Sustainability in relation to current and potential goals?
 - What are the key areas that require further development within each of the initiatives?
 - What could the Ministry of Education do to support the ongoing development of Education for Sustainability in the New Zealand context?

In this evaluation we brought together an outcomes-based evaluation methodology that aligns with a linear, programme logic approach examining inputs and outputs, with an ecological systems approach that highlights the importance of visions, values, principles and processes, as well as the interconnectedness of whole systems beyond discrete steps or

parts. In practice this means that we evaluated the extent to which the data indicated that key EfS principles were evident in school and teacher change, and student outcomes. Our ability to examine student outcomes was somewhat limited by the scope of the project.

The evaluation was conducted in two phases. In Phase One, in 2007, we examined the alignment of each initiative with national and international conceptions of each EfS, the mode of operation of each initiative and the perceptions of staff within the initiatives of the effectiveness of their work. This involved document analysis, interviews with staff and key stakeholders and, for Enviroschools and the National EfS Team, a survey of the facilitators/advisers. During Phase Two, in 2008, the effectiveness of each initiative was examined through interviews (for Mātauranga Taiao), school case studies and lead teacher surveys (for the Enviroschools Programme and National EfS Team).

Findings were analysed using a framework based on four central ideas derived from national and international conceptions of EfS and the objectives of the initiatives:

- Transformational learning—as described above.
- Systems thinking—as described above.
- Cultural interface—emphasising the interrelationships between cultures in New Zealand, especially between Western culture and Māori culture, and dynamic spaces between different cultural ways of knowing/being/doing.
- Professional development—emphasising the focus of the three initiatives on a professional development process to develop EfS professional learning communities.

1.4 Report outline

The remainder of this report provides an overview of the main findings for each initiative (in Chapters 2–4) and examines what each contributes to EfS in New Zealand (full reports on the evaluation of each initiative are in the appendices). Chapter 5 outlines what the three initiatives jointly achieve and Chapter 6 examines challenges and future implications for EfS in New Zealand schools. Appendices 1-3 present full report with data on each initiative. A Brief Summary Report also accompanies this Overview Report.

2. The Enviroschools Programme

The Enviroschools Programme has grown from early beginnings in the 1990s to be a significant factor in EfS delivery in New Zealand schools. The programme is governed by the Enviroschools Foundation and hosts a national office in Hamilton. This office houses the national director, operations director, development and administration staff. These staff provide direction and co-ordination, obtain funding and provide resources and professional development. The national office receives Ministry of Education funding through the project to run the programme.

The Enviroschools Programme operates on a regional basis with the regions defined by the boundaries of the regional councils of New Zealand. From 2008, the programme has been offered in all regions of New Zealand. In 75 percent (9/12) of regions, a regional coordinator runs the Programme from a base within their regional council (in the other regions, the coordinator is based in other organisations) as at March 2009. The regional dimension connects with the local level through employment of facilitators. The regional coordinator raises funding for employment of facilitators through lobbying of their own organisation and contributing city and district councils. The Enviroschools facilitators are primarily responsible for delivering the Programme into schools. In March 2009, there were 65 facilitators working in the Enviroschools Programme¹. The facilitators can be seen as conduits for the flow of education for sustainability resources between the national office and schools in the one direction, and between local government and their communities in another direction. These conduits are important for the connectedness that the concept of sustainability embodies.

The Enviroschools Programme promotes learning and action for sustainability through provision of resources and facilitation support in schools. It aims to create sustainable schools and communities through student engagement and developing competencies that foster achievement of educational and environmental goals. The programme promotes a change in culture both in sustainable living and educational processes.

2.1 Enviroschools Programme alignment with key messages, goals and intended outcomes of EfS

This study finds that in theory the goals and intended outcomes of the Enviroschools Programme align very well with government guiding documents in school-based EfS, with international conceptions of EfS and with specific New Zealand/Māori conceptions of sustainability. Firstly, this alignment is seen in its model of distributed leadership which places the focus of its work at the level of the local community. This encourages schools to be recognised as integral to their communities, and the whole to be seen as a learning partnership for sustainability. Secondly, the alignment is seen in the focus on empowerment of students to become engaged in critical thinking and action for a sustainable future. Thirdly, the alignment is emphasised in notions of a whole-school approach and an inclusive society that recognise that change in systems requires everyone to be involved (Part 2, pages 21–28).

In practice, Enviroschools staff appear well aware of the programme's structure and also aware of aspects that need further work to improve the programme. Staff in schools receiving the Enviroschools Programme seem reasonably clear about the purposes of the programme but may lack some of the systems thinking that would allow them to see the complete picture of EfS. Participants sought further clarity from Government regarding its goals for EfS (Part 2, page 28).

¹ Some enviroschools receive Enviroschools' facilitation from National EfS (NEfS) advisers according to specific regional arrangements.

2.2 The effectiveness of the processes and practices of the Enviroschools Programme

The contexts, processes and practices of the Enviroschools Programme were examined for their effectiveness from the perspectives of the Enviroschools staff and a sample of enviroschools. The following key points emerged:

- The Enviroschools Programme has a distributed leadership structure involving a national office, regional coordination and local facilitation in schools. This structure appears to allow a generally nationally-consistent approach with local interpretation (Part 2, pages 30–34).
- The facilitators who deliver the programme in schools are a highly committed group of mainly part-time women who are knowledgeable about sustainability. These individuals appear capable of delivering sound advice to schools about changes for sustainability (Part 2, pages 31–34).
- School staff were highly complimentary about the knowledge and skills of the Enviroschools facilitators (Part 2, pages 33–34).
- Schools appear to join the Enviroschools Programme for a variety of reasons ranging from a staff-, student- or community-initiated concern for sustainability to a consideration of gaining a marketing edge on competing schools (Part 2, pages 34–35).
- The number of schools who have joined the Enviroschools Programme has risen rapidly since 2002 and at the end of 2008 stood at 639 (Part 2, pages 18–19, 42).
- The facilitation programme provides professional development for school staff and focuses on encouraging a whole-school approach to sustainability wherever possible. Facilitators reported that their main tasks were to provide teachers with resources, environmental/sustainability knowledge and teaching ideas, and encourage student participation in decision making (Part 2, pages 34–38).
- An Awards Framework has now been assimilated into the Enviroschools Programme and provides a dimension that allows schools to chart and celebrate their progress. Whilst providing an incentive for change, there was a call to ensure the awards were fostering genuine and ongoing sustainability progress in schools, and not just providing another feature for schools to tick off as achieved. The new process developed in 2008 may well assist this but it is too early to comment more fully (Part 2, pages 38–39).

2.3 The achievement of their service agreement by the Enviroschools Programme

The Service Agreement objectives of the Enviroschools Programme fall under three headings: national coordination, regional support and programme development. Achievement of the objectives was examined from the perspectives of the Enviroschools staff and a sample of enviroschools. The following key points emerged from the data:

- Strategic direction and growth are being achieved well, as evidenced by the steady increase in schools joining the programme, and development of new initiatives such as Youth Jam.
- Relationship maintenance and growth are being achieved well, as evidenced by continued strong relationships with the Department of Conservation and community councils, and developing relationships with the Ministries of Education and Environment.
- There appears to be good support for regional coordinators, although little data were gathered on this. Raising the profile of environmental education for sustainability was not evaluated.
- The provision of professional development was reported as generally being achieved well with some potential for further development. Facilitator professional development is developing, and new and more advanced training opportunities, particularly in Māori perspectives, were seen to be important for progress. The annual hui, Youth Jam

and regional workshops were seen by most respondents as useful professional development. Facilitators called for more professional development in facilitation/mentoring (Part 2, pages 43–45).

- The development and provision of resources is ongoing, with key resources such as the Enviroschools Kit and the Handbook being recently updated. The Kit, Handbook and Scrapbooks were all valued as useful in their work by both facilitators and teachers. A most important resource was people, either facilitators or community experts. These particular resources were reported as highly valued by the enviroschools respondents (Part 2, pages 45–48).
- Progress towards ensuring student access to EfS pathways and development in kura was reported as evolving steadily, with the latter constrained by availability of trained kaitakawaenga (kura Māori teachers in EfS) (Part 2, page 48).
- Progress towards developing sustainable school operations and buildings was regarded as slow but was seen to be constrained by what schools were allowed to do by controlling authorities (Part 2, page 49).
- Progress in data collection and reporting systems is still developing in the Enviroschools Programme. The development of robust methods for collecting data on outcomes, both environmental and educational, that enhance innovation and commitment to learning whilst recognising the exact purpose of the data collection, would seem to be a priority. New initiatives at both national and regional level that are working towards improving this situation were reported. Improvements could be looked for in training facilitators in collecting data through appropriate research methods, and in ensuring a balance between collection of data on environmental improvement, and on educational outcomes. It is recognised that this latter is not easily achievable at present as the EfS community itself endeavours to understand more about educational achievement in EfS, but it would be important for Enviroschools facilitators to remain knowledgeable about the latest research in this area (Part 2, pages 49–50).

2.4 Impact of the Enviroschools Programme

The impact of the work of the Enviroschools Programme was examined on three levels: organisational change, teacher practice and student outcomes. Key findings were:

Organisational change

- A range of year levels is being engaged in EfS in schools but it is more challenging to engage secondary students (Part 2, pages 52–54).
- Enviroschools teachers reported that the Enviroschools facilitators were having the most impact on school operational practices, curriculum and physical surroundings. Less impact was reported on organisational management (Part 2, pages 54–56).
- Changes to school sustainable practices such as recycling wastes were widely reported by enviroschools teachers (Part 2, page 56).
- Leadership support was seen as vital to the success of EfS in schools and the development of an enviroschool. Most enviroschools teachers reported strong leadership support (Part 2, pages 56–58).
- Enviroschools teachers reported that through EfS there was greater student input into decision making but that this was only successful when it was transparent and genuine. Enviroschools teachers reported that development of enhanced community interactions depended on the nature of their community (Part 2, page 58).
- Enviroschools teachers reported that the main constraint to their development as an enviroschool was time to implement EfS (Part 2, pages 58–60).

Teacher practice

- Enviroschools teachers were strongly supportive of the professional development they received from the Enviroschools Programme. In-school professional development was the most highly rated professional development (Part 2, page 60).
- Enviroschools professional development was most highly rated by enviroschools teachers as practical, enjoyable and helping teachers to incorporate environmental/sustainability content into their teaching (Part 2, page 60–61).
- Enviroschools teachers reported that Enviroschools professional development had helped them gain better understanding of all aspects of sustainability, and how to apply these ideas personally and in their schools.
- Enviroschools teachers also reported that Enviroschools professional development had helped them learn how to support student-planned actions, and teaching and learning approaches in EfS (Part 2, page 64).
- Enviroschools teachers reported that Enviroschools PD had been of less help in understanding how to assess student achievement in EfS (Part 2, page 64).
- Improvements to Enviroschools professional development requested included more facilitator time (Part 2, page 79).
- In terms of teacher change, both Enviroschools facilitators and enviroschools teachers stated that the biggest changes were in inclusion of more environmental/sustainability content in teaching and development of teaching styles that fostered more active student participation in their own learning (Part 2, page 66).
- Enviroschools teachers reported that they were likely to be either delivering EfS as an integrated theme or as an extra/co-curricular activity (Part 2, page 67–68).

Student outcomes

- Enviroschools teachers reported that their EfS work with students was mainly around the themes of water, waste, energy and gardening (Part 2, page 70).
- Enviroschools teachers reported that they were seeing strong student outcomes in critical thinking, knowledge development, action taking and increased engagement in learning (Part 2, pages 70–73).
- Most enviroschools teachers reported evidence of transfer of EfS learning from school to home (Part 2, pages 73–74).
- Some enviroschools teachers reported that their EfS teaching was helping students to develop a better understanding of Māori perspectives of the environment, and encouraging improved Māori student achievement (Part 2, pages 74–75).

2.5 Summary

In this section we summarise our findings on the Enviroschools Programme through the lens of our analytical framework. Table 1 presents this summary as a matrix that addresses what we see as the key aims, achievements and challenges for the programme. The aims are based on intentions of the Enviroschools Programme according to Enviroschools documentation and Enviroschools staff (Part 2, pages 18–23). The achievements and challenges are developed from the impact statements above and the corresponding detailed evidence in Part 2.

Table 1: Summary of findings on the evaluation of the Enviroschools Programme

	Aim	Achievements	Challenges
Transformational learning	Change towards sustainable practices.	Achieving school change and some transfer to students' homes.	Constraints to change from regulatory authorities.
	Empowering teachers and learners.	Evidence of development of facilitative teaching styles.	Lack of initial teacher education in EfS pedagogy.
	Development of student critical thinking and reflection.	Teachers report student development in these areas.	Need to enhance teacher PCK ² in EfS to further develop this.
Systems thinking	Promote whole-school approach to EfS.	Evidence of whole-school approaches in small schools, and those in the programme longer.	Harder in large/secondary schools, and dependent on school leadership support.
	Promote school–community links.	Highly developed in some schools, but not others.	Links dependent somewhat on the nature of the school's community.
	Connect people to their environment.	Good sustainability knowledge base increasing environmental/sustainability content in teaching. Students engaged in environmental actions.	Further develop facilitator and teacher knowledge in economic and political aspects, and Māori perspectives, of sustainability.
	Foster integration of EfS across the curriculum.	Evidence that this is developing and that EfS is providing a vehicle for cross-curricular delivery.	Exemplars needed to scaffold teachers lacking EfS or sustainability knowledge background.
	Develop systems thinking.	Evidence of some connections within and between schools, planning that flows through systems and inclusion of different knowledge systems.	Bringing about genuine school culture change.
Cultural interface	Recognise Māori perspectives and the Treaty of Waitangi.	Partnership with Te Mauri Tau providing excellent resources and facilitator training. Some evidence of outcomes for Māori students.	Demand for resources and training currently outstripping supply.
	Value multiple perspectives.	Resources support multiple perspectives.	Lack of ethnic diversity amongst facilitators.
Professional Development	Distributed leadership that focuses effort at local level.	Evidence of some development of sustainable practices and networking through and between communities.	Maintaining a consistent approach through the distributed leadership. Time required to support this.
	Support for changing practice.	Evidence that ground-up development is leading to good environmental outcomes in schools and communities, which may in time lead to systemic educational change.	Evidence of long-term educational change requires long-term study.
	Reflective conversations.	Data gathering and assessment of EfS under-developed.	Evidence that facilitators and teachers are not confident in recognising achievement in EfS of their school, themselves and their students.

² PCK—Pedagogical content knowledge

3. The NEfS Programme

The NEfS initiative is a professional learning support programme for schools, with national- and regional-level presence. The NEfS strategy is driven by research knowledge about the challenges of educational transformation. It focuses primarily on teacher professional development and teacher learning communities, and foregrounds the importance of teacher pedagogy, curriculum development and student outcomes and achievement.

The NEfS Programme is delivered by the National EfS Team (NEfS), which is led by two NEfS co-coordinators (one of whom is also a regional EfS adviser). They are responsible for building the capacity of EfS nationally, including professional development for the EfS regional advisers. The regional advisers are employed by six School Support Services teams, each associated with a university education faculty. As at late 2008 there were 22 EfS advisers in total, approximately half being part-time in their EfS role (Part 3, page 5).

The NEfS Team grew out of an initial contract to pilot professional development to assist schools with the implementation of the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999). A key goal of the *Guidelines* is to encourage environmentally-responsible behaviour and informed participation in decision making, and its vision is for a clean, healthy and unique environment that sustains nature and people's needs and aspirations. The formal scope and sphere of influence of the EfS advisory service in achieving this goal and vision is somewhat limited, considering that they are attempting to bring about whole systems transformation in schools and education, and in students and society, albeit in combination with the other two initiatives discussed in this report (Part 3, pages 5, 31).

The advisers work with schools at the schools' request and aim to establish professional learning communities within and between schools that would help them work towards the goals described above. Their work is governed by a Regional Output Schedule for EfS within the Ministry of Education Teaching Support Services contract. The regional advisers are expected to: increase teachers' subject knowledge and pedagogical content knowledge (PCK) for successfully teaching EfS programmes; promote changes in teachers' beliefs and practices in relation to helping all students become successful learners, using achievement data to help them make good decisions about how to do so; and help schools to build their cultures as learning organisations with plans to ensure their EfS developments can be sustained over time (Part 3, pages 19–23).

3.1 NEfS Programme alignment with key messages, goals and intended outcomes of EfS

As for the EnviroSchools Programme, this study finds that in theory the goals and intended outcomes of the NEfS Programme align very well with government guiding documents in school-based EfS, with international conceptions of EfS, and with specific New Zealand/Māori conceptions of sustainability. This alignment is seen in the intent to focus on whole-school (systems) change, and on helping schools and individual teachers to align EfS learning with the potentially transformative features of *The New Zealand Curriculum* (Ministry of Education, 2007b), which is currently being implemented in schools. The pedagogies employed by the advisors for their own collective learning and for facilitating teacher learning are congruent with those emphasised in the literature as being needed to achieve transformative change (Sterling, 2001) and to shift teacher thinking (Timperley, Wilson, Barrar, & Fung, 2007) (Part 3, pages 23–26).

In practice, NEfS advisers sometimes struggle to gain the support needed to achieve whole-school change, particularly in secondary schools, and in larger schools. When this is not possible, they work pragmatically to create learning

communities that bring individuals from different schools together, and they work alongside teachers, whatever the realities of their school context, in ways that support them where they are, and help to move their thinking and practice forward. Notwithstanding the intent to include Māori cultural perspectives wherever possible, they lack resources in this area, where they feel they are still learning themselves. The emphasis on the use of assessment data to raise achievement, which is a standard feature of all School Support Services advisers' work, does not sit easily with the more participatory goals of EfS, which are often achieved collectively and include a strong value/dispositional component that cannot be appropriately quantified to make the sorts of data comparisons that are expected and well established in core curriculum areas. We acknowledge that EfS advisers were perhaps attuned to “what we don't yet know” because discussion about cultural responsiveness and student outcomes in transformational learning environments had been a focus of their ongoing professional learning conversations (Part 3, pages 24, 26–31, 37–41, 77–80).

3.2 The effectiveness of the processes and practices of the NEfS Programme

The contexts, processes and practices of the NEfS Programme were examined for their effectiveness from the perspectives of the advisers, a range of school leaders and teachers, and in two case study schools, some students and parents. The following key points emerged:

- Similar to Enviroschools, NEfS has a distributed (though smaller) leadership structure involving national EfS coordinators and regional teams of EfS advisers. This structure provides support to the locally-based advisers, a process for the development of shared resources and hence a degree of alignment between the beliefs and practices of the individuals involved (Part 3, pages 35–40).
- The advisers who deliver EfS in schools are a highly committed group, many working more than their part-time hours. They are seen by teachers to be knowledgeable about EfS and they are responsive to local contexts and challenges so that they can provide flexible professional learning programmes, regardless of the constraints dedicated teachers may face in their schools (Part 3, pages 39–40, 45–48).
- Notwithstanding some tensions between specific EfS goals and the more general goals of School Support Services, the NEfS advisory programme has succeeded in making workable alignments between School Support Service contractual requirements, broader EfS intentions and the ecological approaches to school transformation that are such a strong signal in international EfS theory and suggested best practice (Part 3, Chapter 3).
- In keeping with their systems focus, regional advisers value connectedness and coherence. They connect: individual teachers with whole-school, school-cluster or whole-community professional learning; teachers across year levels and learning areas; EfS with the national curriculum; teachers and schools with EfS resources in their local communities, including Enviroschools facilitators, providers of other complementary education programmes, Mātauranga Taiao facilitators, the New Zealand Association for Environmental Education, and EfS-promoting Non-government organisations such as World Wildlife Federation, and local businesses (Part 3, pages 37–40).

3.3 The achievement of regional EfS outputs

The achievement of the agreed School Support Services regional output schedule was examined from the perspectives of the advisers, teachers, school leaders and some School Support Services managers. The summary is organised by a paraphrased title for these outputs. More detail is provided in the impact summaries that follow:

- **Increase teacher content knowledge and PCK:** NEfS advisers have helped teachers to better understand what sustainability/EfS entails, including the broad intentions of EfS, and the holistic, interdependent and multifaceted nature of sustainability. They have also successfully helped teachers learn about the “how to” of teaching for EfS and how to work towards whole-school shifts towards more sustainable practices. The pedagogy that advisers used,

and teachers described, during this study appears to align extremely well with the seven aspects of effective pedagogy in *The New Zealand Curriculum* (Ministry of Education, 2007b, p. 34) (Part 3, page 85).

- **Change in teachers' beliefs and practices:** EfS encourages effective teaching but making changes is harder in practice. Just over half the participating teachers had actually made changes to their teaching approach. Both primary and secondary interviewees suggested that they had gained new insights for their own teaching by interacting with teachers from other year levels and learning areas through attending NEfS professional development and/or through developing EfS in their school, as supported by an NEfS adviser (Part 3, pages 85–86).
- **Building inclusive school cultures for all students:** Participatory decision making, collaborative learning and acknowledgement of cultural diversity are key EfS principles and most teachers reported that their understanding of these has been strengthened through their work with the NEfS advisers. The advisers model these ways of working and work alongside teachers in their classrooms where possible, thus contributing to the deprivatisation of practice. Some teachers and school leaders are successfully building more inclusive school cultures. EfS is understood to provide opportunities for building greater knowledge of different cultural perspectives, although this remains an area where more support is needed by both the advisers and teachers (Part 3, page 86).
- **Building effective learning communities:** The NEfS advisers aim to establish professional learning communities within schools but they are more likely to succeed in doing so in primary schools, where it is easier to embed the ideas and practices across the whole-school, both in terms of staff involvement and structural changes. They also establish professional learning communities that bring together like-minded teachers from different schools. The structure of the initiative allows the NEfS advisers to work as a professional learning community of their own, pushing boundaries at the leading edge of change (Part 3, page 87).
- **Raising achievement through evidence-informed inquiry:** Student learning outcomes are understood to include engagement and achievement (including across a range of learning areas), self-confidence and self-awareness (related to values clarification and life long learning qualities), sustainability knowledge and behavioural change, critical and systems thinking and action competence. Describing and then determining what counts as evidence of most of these is a developing and contested field, so it is not easy for advisers to document their success in achieving this output. Some teachers had developed ways to understand EfS achievement and/or achievement in learning areas in which they had integrated EfS. Advisers had developed a range of reflective data capture tools and documentation strategies and were encouraging teachers to use these. Both advisers and teachers feel they are building beyond current assessment knowledge and skills, and the NEfS team is asking—and responding to—pertinent questions about how to appropriately assess transformational learning, thus making a valuable contribution towards education fit for the 21st century. The new EfS standards have paved the way for standardised quantitative assessment of selected outcomes for students in the senior secondary school (Part 3, page 87).
- **Planning for sustainability over time:** Many teachers and schools are still in the early stages of developing ideas and practices related to embedding EfS across a whole-school. Progress often appears to be slow or inconsistent, but where it happens indicators include embedding EfS in high-level documentation, a shared commitment to EfS beyond the teachers directly involved in the EfS professional learning and establishing ongoing school-to-school and community collaborations. Again there are indications that this is easier to achieve in small schools and in primary schools, and changes in key staff may impede progress (Part 3, page 88).

3.4 Impact of the NEfS Programme

The impact of the work of the NEfS advisers was examined on three levels; school-wide change, teacher practice and student outcomes. Key findings were:

School-wide change

- EfS is seen as well aligned with *The New Zealand Curriculum* (Ministry of Education, 2007b) because it: encourages school-based curriculum development; identifies sustainability within the future-focused principle; provides rich authentic contexts that entail use/development of values and key competencies and that provide coherence across learning areas (another principle); and emphasises collaborative decision making and big picture thinking to stand students in good stead as lifelong learners prepared for an uncertain future (as articulated in the vision) (Part 3, pages 18, 30–31, 48, 61–62).
- Some schools described EfS as providing an umbrella for design of the whole-school curriculum, while others included EfS as an “integrating theme” across syndicates or learning areas. Both these types of school-wide change were more likely to happen in primary schools, but cross-faculty conversations and planning were also taking place in the case study secondary school (Part 3, pages 60–61).
- Secondary schools are more likely to develop EfS as a co-curricular activity, which is more manageable for a small number of enthusiastic teachers, with some EfS classes offered on the timetable. In practice, this means that only a proportion of the school’s students experience EfS learning opportunities (Part 3, pages 49–50, 60).
- Where EfS was integrated into the secondary curriculum, the learning was most often located in science and social studies (Part 3, page 60).
- EfS contributed to the adoption of participatory practices that involved students, and sometimes their families and communities, in learning decisions and actions. Participatory approaches to school decision making may be more easily achieved in primary schools and in small schools (Part 3, pages 56–57, 63).
- Implementation of changes such as more recycling of wastes and more sustainable purchasing practices is happening in some EfS schools, particularly those where advisers successfully engage the school leadership in embracing EfS at the whole-school level. NEfS advisers were seen to have a positive impact on both leadership support and sustainability practices in most of the primary schools and a third to half of the secondary schools that they worked in (Part 3, page 63).
- Some schools have successfully engaged parents and members of the wider community in participation in sustainability initiatives such as establishing school gardens (Part 3, pages 64–65, 75).

Teacher practice

- Teachers were strongly supportive of the professional development they received from the NEfS advisers. They see the advisers as knowledgeable and good role models for EfS (Part 3, pages 45–48).
- EfS professional learning has supported teachers to deepen their knowledge about the *interdependence* of environmental, social, cultural, political and economic aspects of sustainability. Their independent ratings of each aspect suggest that broadening the scope of sustainability education to connect in economic systems and knowledge from other cultures (and especially Māori knowledge) needs further support and development (Part 3, pages 55–56).
- Teachers see connections between the outcomes intended for EfS, the vision of *The New Zealand Curriculum*, the aims of the *Guidelines for Environmental Education in New Zealand Schools* and some of the outcomes messages in *Ka Hikitia*. There may be barriers to achieving these intentions to their fullest potential in practice (for example, perceptions of an assessment-driven curriculum-coverage imperative in the senior secondary school) (Part 3, pages 61–62, 77–79).

- Most teachers said NEfS professional development had led them to include more sustainability content in their teaching (Part 3, page 63).
- Just over half the teachers indicated that NEfS professional development had led them to adopt more facilitative teaching styles, enable students to share decision making and provide learning opportunities that were more authentic, action-oriented, inquiry-based or cross-cultural. Some of those who did not indicate a change noted that their teaching style already aligned with pedagogies valued by EfS (Part 3, pages 57–60).
- There appears to be some movement towards authentic learning opportunities driving assessment, rather than assessment driving learning opportunities. Advisers introduce teachers to a wide range of potential assessment strategies, which are sometimes taken up (Part 3, pages 80–81).

Student outcomes

- A majority of the teachers said that students had developed their critical thinking skills, reflected on their personal understandings of sustainability, developed their understanding about the biophysical environment, taken action for sustainability and imagined the future through EfS learning opportunities. Nearly as many teachers agreed that students had clarified their ethics and values and modified their lifestyle due to EfS learning opportunities (Part 3, page 72).
- These opportunities are more likely to be provided in primary schools—all were reported by at least 80 percent of the primary teachers, with secondary teachers' self-reports being around 20 percentage points lower (Part 3, page 72).
- Specific learning opportunities that could enable students to develop as “systems thinkers” were ranked lower than other opportunities mentioned in the teacher survey. For example, opportunities for students to question and research a specific environmental issue or strategy were more common than opportunities to question or learn about big picture sustainability themes or opportunities to use a variety of knowledge systems or disciplines to understand sustainability (Part 3, pages 74–75).
- Over half the teachers described ways students translated their learning about/in/for sustainability to their lives beyond school. In decreasing order, examples included: waste management; gardening including vegetable growing and composting; energy conservation; waste reduction; native re-vegetation, such as riparian planting; sustainable procurement; alternatives to car use; and protection of waterways. The overall tendency is to behaviours that “reduce” and “recycle”, more than those that “reuse” and “redesign” (Part 3, pages 75–77).
- EfS learning impacted positively on students' engagement, interest, and motivation in their learning. Some lower achievers experienced successes that noticeably motivated them to better engage with learning in core curriculum areas such as literacy and numeracy (Part 3, pages 73–74).
- EfS principles and some EfS learning opportunities appear to create space for Māori students to bring their cultural knowledge to their learning and for whānau to become more involved in schooling. However, NEfS advisers have had little impact in supporting schools to develop relationships with local iwi, hapū or marae (Part 3, pages 26, 55–56, 64–65).
- Some teachers saw EfS as a means to foreground Māori cultural knowledge, enable students to participate and contribute in ways that were important to their communities and/or provide opportunities to view other cultural forms of knowledge in relation to Western scientific knowledge (Part 3, pages 78–79).

3.5 Summary

In this section we summarise our findings on the NEfS initiative through the lens of our analytical framework, following a structure similar to the Enviroschools section of the overview report. The commonalities of the two programmes are evident when analysed with this holistic framing, as would be expected of initiatives that draw on similar conceptual foundations. Table 2 summarises the aims, achievement and challenges of the NEfS Programme found in this study. The aims are based on EfS intentions according to EfS advisers' interviews and NEfS documents, especially the NEfS strategy (Part 3, pages 19–23). The achievements and challenges are developed from the impact statements above and the corresponding detailed evidence in Part 3.

Table 2: Aims, achievements and challenges of the NEfS Programme

	Aim	Achievements	Challenges
Transformational learning	Transformational approach informed by ecological change principles, constructivist educational theory, the intentions of <i>The New Zealand Curriculum</i> .	Evidence more co-constructive facilitative teaching with authentic, action-oriented, inquiry-based learning opportunities.	Extending ecological participatory change principles throughout school system, including the secondary sector and policy arenas.
	Students develop action competence to become innovative thinkers who act sustainably.	High agreement that students: develop critical thinking, clarify values/ethics, take action, imagine the future, increase environmental knowledge.	Extending Efs opportunities to all students.
	Students experience educational success and achieve in core learning areas.	High agreement that students became more engaged and motivated in learning. Some evidence of increased achievement.	Further developing appropriate assessment strategies to usefully inform student and teacher inquiry.
	Schooling models and catalyses sustainable behaviour and design.	Evidence that sustainability initiatives developed as learning opportunities in schools and similar practices transferred to students' lives beyond school.	Embedding sustainable practices and extending to "redesign" principles with the support of school leadership.
Systems thinking	Shift environmental education to wider sustainability focus.	Teachers enhanced holistic sustainability knowledge (most confidence with "environmental" and "socio-cultural" elements).	Deepening teachers sustainability pedagogical content knowledge. Keeping abreast of new expertise/challenges/opportunities.
	Work with Ministry of Education frameworks and a range of EfS providers/communities to support whole-school shifts towards EfS.	Teachers supported to make cross-curricular connections and school–community links.	Furthering thinking and resources to "deeply" link EfS to the transformative potential of <i>The New Zealand Curriculum</i> .
	EfS as context and content for school-based curriculum development and integration.	Most teachers increased sustainability content in their plans. Some schools developed EfS as integrating theme for whole or part of school's curriculum.	Integrating learning areas to maximise complex systems thinking. Moving EfS beyond science, social studies and co-curricular spaces in secondary schools.
Cultural interfaces	Value Māori pedagogies and sustainability knowledge.	Some evidence that some teachers are including more Māori perspectives.	Maintaining the integrity of Māori knowledge and tikanga.
	Develop EfS bicultural vision that honours the Treaty of Waitangi.	EfS pedagogy and focus has created space for Māori students to participate as Māori.	Developing partnerships with iwi.

Table 2: Aims, achievements and challenges of the NEfS Programme — *continued*

	Aim	Achievements	Challenges
Professional development	Support teachers' action-based exploration of EfS pedagogy and content knowledge.	Teachers learnt "how to" provide EfS learning opportunities.	Working with teachers' (tacit) learning theories that contrast with EfS pedagogy.
	Foster EfS professional learning communities across schools, communities and regions.	Enhanced individual teacher learning, with professional learning communities established within and between some schools.	Building ongoing whole-school EfS learning communities, particularly in large primary and secondary schools.
	Model EfS professional learning community as EfS advisers.	Regional and national networks generate and distribute EfS learning and leadership.	Building collaboration with other School Support Services advisers.

4. Mātauranga Taiao

Mātauranga Taiao was born from a decade of intermittent hui that brought together Māori educators interested in environmental education, and development work in the area by members of the National EfS Programme. There was recognition that a stand-alone initiative was needed to develop mātauranga taiao (environmental knowledge) through a group that was distinct from the National EfS Team (Part 4, pages 5–6).

Mātauranga Taiao is a professional development service specifically dedicated to sustainability education in Māori-medium education. Its project director and national coordinator is based in Te Kura Māori at Victoria University of Wellington. The service has two regional coordinators, one for the North Island and one for the South. Together the coordinators have provided two years (2007–8) of professional support for 25 kaiako and Resource Teachers of Māori (RTMs). The intention was that these “students” would essentially become Mātauranga Taiao advisers/facilitators with their own kura initially and another in the second or third year (Part 4, page 1).

4.1 Mātauranga Taiao alignment with key messages, goals and intended outcomes of EfS

- There are some alignments between Education for Sustainability as expressed in international and national documentation and the kaupapa of Māori-medium education. At the same time Mātauranga Taiao represents a move away from Māori educators contributing a Māori perspective to add into mainstream environmental education programmes and associated teacher education (Part 4, pages 1 and 21).
- Mātauranga Taiao is embedded in, and draws explicitly from, Māori epistemologies and addresses many of the issues that EfS is concerned with. While mātauranga taiao literally means “knowledge about the environment” Māori epistemologies mean that the programme’s name encapsulates much more than cognitive knowledge about the physical environment (Part 4, page 7).
- A number of philosophical and conceptual understandings underpin Mātauranga Taiao. One is the interconnectedness and interdependability between the physical environment, people and ātua Māori, as expressed, for example, through whakapapa matrices and whakataukī. Another is the importance of puna (literally “wellsprings” or sources) of knowledge situated in local communities, and related to this the connections between narrative and environmental wellbeing. Historical stories, such as pēpeha, pakiwaitara and pūrākau, are part of “knowing” the environment and are integral to the wellbeing of the physical environment (Part 4, pages 7–9).
- These types of conceptual understandings were central in interviewees’ narratives and guided the aims and process for the professional development programme.

4.2 The effectiveness of the processes and practices of Mātauranga Taiao

- The backbone of the Mātauranga Taiao Programme was a series of five national noho held in different locations over a two-year period. Each noho included a range of workshops facilitated by the Mātauranga Taiao coordinators and various guest speakers and the learning was grounded in the specific context of the land. These supported kaiako/RTMs³ to, for example: experience learning in the specific environment, develop teaching resources for their kura; and make connections with the puna mātauranga in their local communities. Between the noho Mātauranga Taiao coordinators provided follow up support to kaiako/RTMs during site visits and via telephone and email contact (Part 4, pages 11–12).

³ Please note that we refer to the kaiako/RTMs in the Appendix 3, Mātauranga Taiao report.

- Mātauranga Taiao's pedagogical process of co-constructing mātauranga taiao with the kaiako/RTMs, and then in turn to supporting these kaiako/RTMs to co-construct knowledge with their kura students and local communities, strengthened over time. This was evident in the progression of the noho, where there was a move from bringing in environmental experts and sharing relevant literature towards more emphasis on whakaaro Māori and with kaumātua in each area to building kaiako/RTMs' lived knowledge about sustainability from within traditions and korero (Part 4, pages 14–15).
- Kaiako/RTMs enjoyed participating in the programme and considered it to be valuable learning. Their evaluation form responses demonstrated that kaiako/RTMs most appreciated: site visits; guest speakers; working collaboratively; and developing their critical thinking skills. They found the inquiry, experiential and cooperative learning activities the most useful, and this is consistent with the coordinators' comments that the professional development needed to be as focused on pedagogy as on mātauranga taiao (Part 4, page 12).
- The kaiako we interviewed were also positive about the programme, although they felt that they would have benefited from more onsite support during 2008. (Unfortunately the North Island regional coordinator retired during 2008 and was not replaced. While the national coordinator did make a number of site visits, the overall level of support was more limited than the kaiako/RTMs we interviewed had hoped for.) (Part 4, page 12).

4.3 The impacts and outcomes of the Mātauranga Taiao Programme

- The programme has contributed to the development of new understandings about environmental education in Māori-medium settings.
- Kaiako/RTMs reported that the Mātauranga Taiao Programme enabled them to feel part of a community of mātauranga taiao educators who shared practices beyond the noho. They also gained the confidence to approach others with the relevant expertise to offer new learning opportunities for their kura and further mātauranga taiao kaupapa in their community. Several networks also developed, including a cluster of kura from the central North Island and East Coast, that organised a wānanga with well respected and knowledgeable elders (Part 4, pages 14–16).
- Kaiako/RTMs made links between mātauranga taiao and the Marautanga o Aotearoa. The kaiako/RTMs were shown how to meet the outcomes of different learning areas, including hauora and pūtaiao, by focusing on the kaupapa of mātauranga taiao (Part 4, pages 16–18).
- Developing mātauranga taiao (environmental knowledge) enabled the kaiako/RTMs to more strongly centre mātauranga Māori in their kura curriculum. For example, Māori stories and traditions were the lens that kaiako/RTMs used to investigate and understand the taiao (Part 4, pages 16–18).
- Interviewees also commented that their involvement in the Mātauranga Taiao Programme had contributed to a change towards a taiao focus in their kura. Their end-of-year reflections suggested a growing commitment from kaiako and whānau to the kaupapa. Their comments with the national coordinators suggest that in the long term kura taiao might emerge alongside kura kaupapa Māori and kura-a-iwi, or mātauranga taiao principles might become more explicit within all kura (Part 4, page 18).
- The kaiako/RTMs developed a number of teaching programmes in their kura, including exploring the narratives of the people/land and making their kura more sustainable. By the last noho they were able to report on how they had planned and implemented these. The way these programmes were implemented varied. In one kura, for example, Te Taiao was the central organising framework for thematic studies that incorporated the other curriculum areas of: hauora; te reo; hangarau; nga toi; and putaiiao. Units of work reported by the Mātauranga Taiao students covered topics such as: recycling; gardening activities, including research into kumara as well as growing and harvesting; learning about the local vegetation and Māori medicinal uses; and investigations into energy use and water

quality/health. Some also described how they had evidenced student learning in mātauranga taiao. They also shared support material that they had developed over the two years, including various unit plans (Part 4, pages 18–20).

Overall, the programme contributed to the capacity of facilitators (the kaiako/RTMs) to implement Mātauranga Taiao into the educational programmes and physical environments of their kura. As this is such a new and important area, we suggest that more time and greater critical mass of coordinators/kaiako/RTMs is needed. Mātauranga taiao, although drawing from a large body of knowledge and practices from Māori epistemologies, is still a very young initiative and it has not yet had time to build the knowledge and best practices for widespread developments across Māori-medium education. The notion of a standalone initiative is important for consolidating Māori conceptions of, and approaches to, developing mātauranga taiao. In the longer term this has the potential to offer challenges to EfS professional development in English-medium schools, which will in turn have benefits for Māori students throughout New Zealand, and to become a significant influence on national conceptions of EfS (Part 4, pages 23–25).

5. The contributions of the three initiatives to EfS

This chapter brings together our findings from the evaluations of the separate initiatives to consider what they contribute as a group to the development of EfS in New Zealand schools. We also identify a number of gaps that suggest opportunities for the ongoing development of EfS.

5.1 The EfS system

The different genealogies and accountabilities of each of these three initiatives mean that different aspects of the EfS system could be said to be supported by each initiative. They bring governmental, community and indigenous approaches which address current priorities for the Ministry of Education (Ministry of Education, 2009):

- The EnviroSchools Programme focuses on learning communities that draw on—and develop—the leadership of students and community members, and it foregrounds: community partnerships; sustainable school practices; and student leadership/engagement. The EnviroSchools Programme draws on educational knowledge from the community sector, including Māori knowledge. The programme has resources to support kura kaupapa Māori and mainstream Māori education and is developing capacity in this area as supported by a partnership with Te Mauri Tau at the national level.
- NEfS focuses primarily on teacher professional development and teacher learning communities, and it foregrounds: teacher pedagogy; curriculum development; and student achievement. NEfS draws on educational knowledge from the academic and government sector. NEfS has limited capacity to support Māori-medium education, as it is vested in the third initiative, Mātauranga Taiao.
- Mātauranga Taiao focuses on teacher professional development and teacher learning communities in kura kaupapa Māori, and it foregrounds co-constructing mātauranga taiao. Mātauranga taiao draws on situated knowledge from local contexts. Mātauranga Taiao has developed specifically to support Māori-medium education, including kaupapa Māori, and is developing knowledge, resources and teacher capacity simultaneously.

National and regional sharing between the initiatives shows that they mutually support one another and work strategically for EfS. EnviroSchools facilitators and NEfS advisers in particular collaborate in ways that make best use of the skill sets of the individuals involved and the institutional knowledge of each initiative. The three EfS programmes each offer something unique for EfS and together they contribute to the Government's key EfS messages and help build New Zealand towards a more sustainable future. From both a 21st century knowledge generation perspective and a deep ecology perspective, it is important to have many components and interconnections within a change system to enable continuous learning and growth—and the potential for transformation.

5.2 Achievement of outcomes

The evaluation demonstrates that the three initiatives interact to generate change at a collective level across different contexts. Based on the evidence provided above and detailed in the appendices we find that together the initiatives have contributed to the following outcomes:

- **Policy**—the three initiatives have worked together to develop strategy for EfS and have provided leadership in assisting policy development at government levels. They have developed a unified view of their general approach to EfS, *Toitu te Ao*. A key gap appears to be the lack of a systems approach to cross-government strategy for development of EfS in order to better support the work of these initiatives and other non-governmental organisations.

- **Curriculum**—these initiatives are impacting on the inclusion of environmental and sustainability content in teaching and learning that connects with the “front end” of *The New Zealand Curriculum*. This appears to be occurring more readily at primary than at secondary level, and occurring through integration into the learning areas rather than as a stand-alone topic. Teachers are developing more confidence in their knowledge for teaching in this realm. The initiatives address curriculum development from their different perspectives bringing a multifaceted approach with potential to combine academic thinking, community needs and indigenous perspectives. A key gap appears to be in the availability of specific resources such as exemplars that show teachers how they could integrate EfS into their curriculum.
- **Pedagogy**—these initiatives are impacting on the development of more facilitative teaching styles as befitting a transformative learning approach. These approaches are seen to be more challenging by teachers, but also more rewarding for learners, as they allow students to share decision making, and provide learning opportunities that are more authentic, action-oriented, inquiry-based or cross-cultural. Some participants suggested that there may be a gap in the extent to which initial teacher education fosters these teaching approaches in new teachers.
- **Assessment**—these initiatives are beginning to develop ideas around assessment in EfS. This is an area for further development as the data and literature suggest that there are significant challenges in developing appropriate and useful measures of student outcomes in this field.
- **Professional development**—these initiatives provide valued professional development both within and outside the school, and at individual, collective and whole-school levels. They also foster interschool and school–community networks for sharing of knowledge and skills. It appears that demand is beginning to outstrip supply with calls for more professional development opportunities by schools and a frustration expressed by the professional developers about not being able to provide the service requested.
- **School operations**—these initiatives are impacting on school operational practices, in particular planting and gardening, waste management, water and energy conservation. Schools’ sustainability practices provide meaningful learning and leadership contexts for students. The practices are becoming embedded when supported by the whole-school and its community. The initiatives encourage schools to include all members of the school community, particularly students, in developing visions for a sustainable school. A key gap appears to be a lack of support or coherent planning by regulatory authorities to assist schools to become more sustainable.
- **Community interactions**—these initiatives are impacting on the development of stronger school–community interactions for EfS. These are being influenced by the nature of the school communities and require time and energy to sustain them. Recognition of the educative potential of the school–community interactions is showing benefits for the schools.
- **Evaluation**—these initiatives together are developing some strategies for evaluating change in collective educational and environmental outcomes in schools and communities. A challenge is to establish evaluation processes that will enable an exploration of the long-term outcomes of emerging sustainability innovations.

5.2.1 Student outcomes

This evaluation has reported a range of student outcomes being achieved by the three EfS initiatives. These can be described using the lens of action competence, a theoretical approach that expresses the potential of a learner to think, feel and act in a sustainable way. This evaluation, drawing primarily on teacher report, suggested development of action competence for sustainability through the work of the initiatives in the following ways:

- Most students developed critical thinking and personal reflection about sustainability. These were amongst the most frequently reported student outcomes in the Enviroschools and NEfS evaluations.

- Students considered their own and others' knowledge and perspectives in addressing sustainability issues. This included students contributing and exploring Māori knowledge in some schools.
- Students were strongly engaged in their learning and were actively involved in locally-relevant, authentic learning opportunities. Nearly all participants reported that EfS increased students' interest and motivation in their learning.
- Students planned and took action to promote sustainability in their schools and communities. While data suggested that most EfS learning opportunities involve students taking action, it also indicated that this opportunity was limited to some students or to contained projects and did not always reflect school-wide democratic decision making. There was some case study evidence that where action taking was an intentional choice, such as through joining an enviorgroup, then more successful and sustainable action resulted.
- Students showed evidence of transfer of learning to take actions at home on sustainability issues. There were multiple examples of this evidence, leading to a conclusion that initiative-supported EfS is having an impact on schools' immediate community members—its parents and caregivers.
- Taking the data as a whole we suggest that EfS, as envisaged and supported by the initiatives, appears to be developing students who are: active contributors to social, cultural, economic and environmental wellbeing; innovative designers; systems thinkers; community builders; protectors of diversity; and leaders of creative responses to sustainability challenges.

5.3 Summary

This chapter has examined the contributions of the three initiatives to the delivery of EfS in New Zealand, and has identified some gaps in the current delivery system. This suite of initiatives is quite unique in New Zealand school education, in that together they combine elements of academic, community and indigenous perspectives that support the kind of systems approach that is internationally advocated for EfS.

The evaluation demonstrates that the three initiatives contribute to meeting a broad array of EfS intentions. They bring about change in individual schools, teachers and students, as well as in wider education and community systems. The initiatives provide direction for transforming education to reconnect learners to their biophysical, social and cultural environments and develop sustainable citizens of the future. Their combined outcomes appear to align with EfS “big picture” visions—the goal of creating more sustainable schools and communities.

The initiatives are achieving significant outcomes in policy, curriculum, pedagogy, school operations and community interactions, and they are slowly developing approaches to assessment and evaluation. When a holistic view is taken of the work of the three initiatives, we can see that they are striving towards sustainable learning communities that continue to build relationships and innovate beyond input from the initiatives themselves.

However, there are gaps in EfS delivery in New Zealand schools that could be addressed through improved government-level policy development, planning and strategic thinking, enhanced teacher education and further research into EfS. These gaps are now elaborated in our considerations of the challenges and implications for the future of EfS.

6. Future directions

This evaluation concludes that, together, the three initiatives are contributing to bring about changes in the way that education operates in schools, in concert with developing students', teachers' and schools' approaches to sustainability. However, several challenges remain in order to realise goals espoused nationally and internationally for EfS.

6.1 What are the current challenges and what is needed?

The evaluation suggests at least three key challenges for EfS in New Zealand schools. Below, we summarise these challenges and identify possible “next steps” for addressing them.

Challenge: Although there are some good examples of EfS in secondary schools, it is an ongoing challenge to support EfS development and integration into secondary curriculum and teaching practices.

Possible next steps:

- Short term: Support the development of secondary-specific resources to build teachers' understandings of EfS across and within secondary subject/discipline areas. These might, for example, include “expert” sustainability knowledge relevant to particular disciplines, as well as indicating ways to align EfS with the intentions of *The New Zealand Curriculum* and the National Certificate Educational Achievement in various subject/disciplinary areas.
- Long term: Ensure that future developments across all the systems components of secondary education (policy, curriculum, pedagogy, assessment/qualification, school operations and community interactions) are aligned to support EfS. EfS has great potential to promote engagement of secondary students through authentic, flexible and empowering education.

Challenge: The three programmes (NEfS, EnviroSchools and Mātauranga Taiao) are developing and adding to the New Zealand knowledge base for EfS, at the same time as they are delivering professional learning in the area.

This can be viewed as both a challenge and a strength. As discussed, intersectoral and interdisciplinary networks have played an important role in developing national and international knowledge about sustainability and EfS. This process aligns well with contemporary views about the nature of knowledge building in the 21st century (Gilbert, 2005; Sawyer, 2008). However, as participants in the evaluation noted, both EfS knowledge development, and delivery of professional learning in EfS, are demanding tasks that require time, as well as particular combinations of skills and strengths.

Possible next steps:

- Recognise that developing the knowledge base while simultaneously delivering professional learning requires sufficient time and support, as well as the right combinations of people and knowledge.
- Provide strong linking opportunities between the professional developers and the growing knowledge base through regular and ongoing professional development opportunities for the facilitators and advisers.
- Foster and encourage the development of EfS in all initial teacher education programmes, so that beginning teachers are well prepared to deliver EfS in their classrooms.

Challenge: The national and global significance of “sustainability” is rapidly evolving and developing across all sectors (including financial, governmental, legislative and community and social sectors, etc.) and EfS needs to stay connected up with these emerging developments.

Possible next steps:

- Develop a coherent, systems-based government strategy which identifies sustainability, including EfS, as a driver for policy making across all sectors. This should incorporate inter-governmental planning and demonstrate clear articulation of policy from strategic level through to practice level.
- Develop stronger synergies between central and local government for development of EfS that encourage consistent policy making and effective programme development.
- Provide support for EfS initiatives to build and maintain networks with people and groups working in sustainability and EfS across different sectors.
- Foster and encourage research into long-term outcomes of EfS in schools to inform the development of enhanced EfS delivery.

6.2 Concluding statement

This evaluation concludes that the three EfS programmes are contributing to bring about educational change that is building collective knowledge and active participation for a sustainable future. Arising from three quite different foundations, the three programmes are fostering grass-roots commitment to sustainability within schools. The professional development support is encouraging more transformative learning opportunities, improved student engagement and stronger school–community interactions. However, while there is some evidence of very good progress in these areas, this is not pervasive within or across all schools, particularly secondary schools. We would encourage further attention be paid to development of a coherent government strategy that would further strengthen EfS delivery in all New Zealand schools.

References

- Gilbert, J. (2005). *Catching the knowledge wave? The knowledge society and the future of education*. Wellington: NZCER Press.
- Jickling, B., & Wals, A. E. J. (2007). Globalization and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies*, 40(1), 1–21.
- Ministry for the Environment. (1998). *Learning to care for our environment: A national strategy for environmental education*. Wellington: Author.
- Ministry of Education. (1993). *The New Zealand Curriculum Framework*. Wellington: Author.
- Ministry of Education. (1999). *Guidelines for environmental education in New Zealand schools*. Wellington: Learning Media.
- Ministry of Education. (2007a). *Statement of Intent 2007–2012*. Wellington: Author.
- Ministry of Education. (2007b). *The New Zealand Curriculum*. Wellington: Learning Media.
- Ministry of Education. (2009). *Statement of Intent 2008–2013*. Retrieved 25 April 2009, from http://www.minedu.govt.nz/theMinistry/PublicationsAndResources/StatementOfIntent/SOI2008/Strategic_direction.aspx#Ministry_of_Education_priority_outcomes
- Parliamentary Commissioner for the Environment. (2004). *See change: Learning and education for sustainability*. Wellington: Author.
- Sawyer, K. (2008). Optimising learning: Implications of learning sciences research. In Centre for Educational Research and Innovation (Ed.), *Innovating to learn, learning to innovate*. Paris: Organisation for Economic Development.
- Sterling, S. (2001). *Sustainable education. Re-visioning learning and change*. Foxhole, Dartington, Totnes, Green Books.
- Sterling, S. (2001). *Sustainable education: Re-visioning learning and change*. Bristol, Green Books.
- Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research*, 1(2), 195–212.
- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development: best evidence synthesis iteration (BES)*. Wellington: Ministry of Education.
- UNCED. (1992). *Agenda 21*. Retrieved 10 July 2007, from www.unesco.org/education/English/chapter/chapter.shtml
- UNESCO. (2007). *Education for Sustainable Development*. Retrieved 20 July 2007, from http://portal.unesco.org/education/en/ev.php-URL_ID=23280&URL_DO=DO_TOPIC&URL_SECTION=201.html

Part Two:

Report on the Enviroschools Programme

Chris Eames

Preliminary Note

Part Two of this report concentrates on the provision of an Education for Sustainability (EfS) initiative in schools by the Enviroschools Foundation. Part One provides an overview of the main findings for each initiative and examines what each contributes to EfS in New Zealand. The other evaluation findings for each initiative appear in Parts Three and Four.

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Finally, we acknowledge the Ministry of Education for providing us the opportunity to conduct this evaluation.

Overview

This report focuses on the provision of an Education for Sustainability (EfS) initiative in schools by the Enviroschools Foundation. This Enviroschools Programme was one of three initiatives being evaluated for the Ministry of Education, the other two being the National EfS Team and Mātauranga Taiao. This evaluation took place between May 2007 and May 2009. The evaluation team focussed on the individual contributions each initiative made to EfS in our schools as well as on their joint contribution.

The Enviroschools Programme began in Hamilton in the late 1990's as a local government initiative and now involves approximately 20 percent of all New Zealand schools. The programme delivers EfS professional development support in schools through a local and regional structure funded by local government and supported by a national office. The national office is funded currently by the Ministry of Education.

The evaluation of the Enviroschools Programme was conducted in two phases. In Phase One, in 2007, we examined the alignment of each initiative with national and international conceptions of each EfS, the mode of operation of each initiative, and the perceptions of staff within the initiatives of the effectiveness of their work. This involved document analysis, interviews with staff and key stakeholders and where appropriate, a survey of the school advisors. During Phase Two, in 2008, the effectiveness of each initiative was examined through a series of case studies in schools and a wider teacher survey. Findings were analysed using a framework based on four central ideas derived from national and international conceptions of EfS and the objectives of the initiatives. These were transformational learning, systems thinking, cultural interface, and professional development.

The findings showed that the goals and intentions of the Enviroschools Programme are aligned very well with government messages and espoused directions for school-based EfS, with international conceptions of EfS, and with specific New Zealand/Māori conceptions of sustainability. This provides good potential for effective EfS delivery. This potential is further enhanced through the use of a distributed leadership model, and a committed and knowledgeable group of facilitators delivering the programme in schools. National coordination is providing strong direction and growth, and effectively building partnerships. Regional support is being achieved through professional development provision that is meeting needs and production of valued resources. Programme development is ongoing with key issues identified for attention.

There was evidence in the findings for impacts of the programme on organisational change in schools in development of more sustainable practices, changes to the curriculum, and to the physical surroundings of the school. Leadership support in schools was seen to be crucial to enable these changes. Impacts on teacher practice reported included development of teacher knowledge and pedagogy, leading to inclusion of more environmental/sustainability content in teaching, and development of teaching styles that fostered more active student participation in their own learning. Teachers reported enhanced student outcomes such as knowledge development, action-taking, increased engagement in learning, as well as transfer of learning from school to the home environment.

Considerations for the future of the Enviroschools Programme include that the programme is underpinned by a kaupapa that is providing a strong foundation for development and a commitment to the endeavour from those involved. The development of the programme, and EfS in New Zealand schools generally, could be improved by a more clearly defined and integrated approach from central government.

1. Introduction

This report focuses on an evaluation of the work of the Enviroschools Programme. This work is part of an Evaluation of Education for Sustainability (EfS) initiatives project being funded by the Ministry of Education. The three initiatives being evaluated are the Enviroschools Programme, the National EfS Team, and Mātauranga Taiao.

The purpose of this report is to provide the background data and analysis to Chapter 2 in the Summary report [*Education for sustainability in New Zealand schools: An evaluation of three professional development programmes*], and to report our findings from the study, being a focus on the background and intended outcomes, and the reported outcomes of the work, of the Enviroschools Programme.

1.1 Education for sustainability

“Education for Sustainability” (EfS) can be considered an enriched extension of what has previously been referred to in the New Zealand school sector as “Environmental Education” (EE). The recent shift in language from EE to EfS is significant, as it reflects a broadening of concern away from an educational approach that largely focuses on environmental and conservation issues, to one which integrates concerns for social, political and economic development, and addresses education for long term ecological and social sustainability (Parliamentary Commissioner for the Environment (PCE), 2004; Daniella Tilbury, 1995).

Various international summits and declarations on the environment and sustainability—including *Agenda 21*—have put pressure on governments to demonstrate actions they are taking towards becoming more sustainable. The language of “sustainability” is gaining increasing currency and public recognition in New Zealand (Clark, 2007; Parliamentary Commissioner for the Environment (PCE), 2004; Statistics New Zealand, 2002). However, the language of “environmental education” has, until recently, tended to predominate in the school sector.

While its roots begin with the start of civilization, centralized formal school-based EfS and associated professional development grew in response to national and international attention to environmental issues in the 1960s and 1970s. A series of international meetings focused on the need for environmental education led to greater knowledge about these problems and hence actions to resolve them. A growing realisation of the inseparability of environmental problems from human endeavour culminated in a re-orientation of thinking towards sustainable development at the Rio Earth Summit in 1992 (UNCED, 1992). National interest in environmental sustainability and education culminated in two key government documents in the late 1990s: *Learning to Care for Our Environment: Me Ako ki te Tiaki Taiao* (Ministry for the Environment, 1998) and then *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999).

One community-based initiative that sprang from this development of concern was the Enviroschools Programme.

1.2 The Enviroschools Programme

The Enviroschools Programme has grown from early beginnings in the 1990’s to be a significant factor in EfS delivery in New Zealand schools. The programme is governed by the Enviroschools Foundation and hosts a national office in Hamilton. This office houses the National Director, Operations Director, development and administration staff. These staff provide direction and coordination, obtain funding, and provide resources and professional development. It is the national office that is receiving Ministry of Education funding through the project, and the service agreement stipulates three areas for service delivery, being national coordination, regional support and programme development. These are further discussed in Section 3.1.

The Enviroschools Programme operates on a regional basis with the regions defined by the boundaries of the regional councils of New Zealand. From 2008, the programme has been offered in all regions of New Zealand. In 75 percent (9/12) of regions, a regional coordinator runs the programme from a base within their regional council (in the other regions, the coordinator is based in other organisations). The regional coordinator then coordinates the delivery of the programme in their region through helping to recruit schools, supporting, coordinating and securing funding for the facilitation work, organising events to support their local enviroschools¹ and linking with the national office.

The regional dimension connects with the local level through employment of facilitators. The regional coordinator raises funding for employment of facilitators through lobbying of their own organisation and contributing city and district councils. Depending on the level of funding gained, the regional coordinator then appoints facilitators to deliver the programme in schools (although in some areas the facilitators may be directly employed by the contributing councils). The Enviroschools facilitators are primarily responsible for delivering the programme into schools. In March 2009, there were 65 facilitators working in the Enviroschools Programme.

The Enviroschools Programme can be viewed as a partnership programme that situates the facilitation in schools at its heart. The facilitators can be seen as conduits for the flow of education for sustainability resources between the national office and schools in the one direction, and between local government and their communities in another direction. These conduits are important for the connectedness that the concept of sustainability embodies.

The Enviroschools Programme promotes learning and action for sustainability through provision of resources and facilitation support in schools. It aims to create sustainable schools and communities through student engagement in developing competencies that foster achievement of educational and environmental goals. The programme promotes a change in culture both in sustainable living and educational processes.

This report presents the evaluation conducted on the Enviroschools Programme. The next chapter describes how the evaluation was conducted.

¹ The Enviroschools Foundation and Programme are referred to with a capital E, but the schools themselves are designated with a lower case e.

2. Methodology

In order to evaluate an initiative, it is common for evaluators to develop a logic model to represent the expected sequential relationships between a programme's intended inputs, outputs, and outcomes, from the immediate, to the medium-term, and long-term (Duignan, 2004; Monroe, Fleming, et al., 2005; Rogers, Huebner et al., 2000). One criticism of this approach is that it represents a linear and mechanistic view of the world, one that could be seen to contrast quite sharply with the ecological systems approach that underpins EfS (Sterling, 2001). It assumes that outcomes can be predicted and defined ahead of time, and that everyone within a programme or change-system should be heading towards the same destination. In fact this is often not the case in innovative developments nor in complex systems (Patton, 2009). Table 1 provides a very brief illustration of the key differences between these two approaches. Ecological models highlight the importance of visions, values, principles, and processes (rather looking to find replicable models and measurable final outcomes), as well as the interconnectedness of whole systems (rather than focusing on discrete steps or parts).

Table 1: The focus in two different models

Ecological/Holistic	Mechanistic/Logic
Visions for an uncertain future	Blueprints for change
Foreground principles and processes for change	Foreground expected outcomes of change
Change is continuous and emergent	Change occurs in steps and stages
Interconnected whole	Discrete parts
Complex systems	Simple/complicated systems
Assumes principles emerge from—and adapt in—local contexts	Assumes that models can be perfected and replicated across contexts

The Enviroschools Programme promotes an ecological, systems approach to education for sustainability in schools. This approach seeks a cultural shift in education from a focus on prescribed outcomes to a holistic, dynamic view of education that requires connectedness across the curriculum, schools and their communities. This disavows the notion of blueprints for change, and emphasises adaptability and resilience for an uncertain future.

With this in mind, in this evaluation we have attempted to balance our client's request for an outcomes-based evaluation with a more ecological approach. We are aware that different representations of change processes have implications for how evaluators might go about understanding whether an initiative is meeting specific objectives and big picture aims. For example, there are at least three ways to judge whether EfS "outcomes" are being achieved. We could ascertain whether and to what extent (and possibly how, for whom, and within which contexts):

- EfS principles are expressed in different ways throughout schools and the education system as the "modus operandi" of all participants.
- Predetermined steps of change have occurred as the flow on effects from EfS professional development (ie, there is attributable transference from the Enviroschools facilitators to teachers/schools to student outcomes).
- There is an improvement in the future state of the education system and the health of our planet and its communities in, for example, 20 years time.

We have used a combination of the first two in this evaluation ("principles" and "steps"), while keeping our eye on the third ("futures"). In practice this means that we evaluate the extent to which we believe key EfS principles are evident in school, teacher, and student outcomes.

In order to do this we developed an analysis framework (discussed in the analysis section below) according to the evaluation team's understanding of principles and visions for school-based EfS as informed by literature and our previous research on environmental/sustainability education and other education developments. A set of evaluation questions, negotiated between the evaluation team and the Ministry of Education (with minimal input from any EfS initiative), informed our evaluation design and the structure of this report.

2.1 Evaluation questions

The questions that guided this evaluation were:

1. What are the key messages, goals and intended outcomes of school-based EfS and how does each initiative align with these?
 - What key motivations and developments have informed and supported the initiation and growth of these initiatives?
 - How have the goals and intended outcomes of each initiative aligned with or extended the "Aims for Environmental Education" outlined in the *Guidelines for environmental education in New Zealand schools* and other government guiding documents in school-based environmental education?
 - How do the goals and intended outcomes of each initiative align with or extend internationally-promoted and New Zealand governmental "key messages" for EfS in schools, and specifically New Zealand/Māori conceptions of sustainability?
2. How effective are the three initiatives in "operationalising" EfS key messages and achieving EfS goals in schools?
 - What and how do contexts, processes, and practices support the achievement of EfS outcomes within each initiative?
 - To what extent have the initiatives achieved the goals and outcomes set out in their service agreements with the Ministry of Education?
 - To what extent do the EfS initiatives impact on: students' learning opportunities, understanding and assessment of student learning outcomes in EfS; teaching practices, including pedagogical change; school-wide structures and curriculum development; and community partnerships and sustainability?
 - To what extent do the initiatives individually contribute to the achievement of EfS goals?
 - How do the three initiatives work together and complement each other to achieve EfS goals?
 - To what extent do the initiatives achieve outcomes suggested by wider literature and conceptions of Education for Sustainability (in comparison with Environmental Education)?
3. What are the future directions for school-based Education for Sustainability in relation to current and potential goals?
 - What are the key areas that require further development within each of the initiatives?
 - What could the Ministry of Education do to support the ongoing development of Education for Sustainability in the New Zealand context?

2.2 Phase One of the Evaluation

The first phase of the evaluation focused on understanding the background and intended outcomes of the initiative, how the Enviroschools staff understand and carry out their work, and how they assess their impact and barriers and opportunities associated with achieving their outcomes. In the first year of the evaluation we gathered data through individual interviews, a questionnaire, and document analysis. These comprised:

- 2 individual and 1 focus group interview with national office staff
- 3 regional coordinator individual interviews
- 4 regional facilitator interviews
- 1 individual interview with a member of Te Mauri Tau
- 31 completed facilitator questionnaires.

Coordinators and facilitators were chosen for potential participation on the basis of the duration of their involvement in the programme, the size of their region in terms of numbers of Enviroschools involved, the nature of the regional coordinating organisation and the employment arrangements with their facilitators. Individual interviews were either conducted face to face or by telephone. Summary transcripts of these interviews were made and passed back to the participant for verification. Focus group interviews were conducted face to face, audio-taped and analysed.

The questionnaires were mailed to all Enviroschools facilitators at addresses supplied by their respective regional coordinators. A stamped, self-addressed envelope was provided for questionnaire returns. A response rate of 31/37 (84 percent) questionnaires was achieved. The questionnaire contained both open and closed questions (see Appendix 1A).

We also interviewed (individually or in a focus group) a number of other representatives of key organisations who have an interest in EfS. These included the Department of Conservation, the New Zealand Association for Environmental Education, the Royal Society, the Greater Wellington Regional Council, WWF New Zealand, and the Sustainable Business Network (the Ministry for the Environment declined to participate).

Our document analysis included the Enviroschools Service Agreement, and key Enviroschools documentation such as the Enviroschools Kit, Handbook and Scrapbooks, and Enviroschools milestone reports to the Ministry of Education.

Data analysis was conducted according to our evaluation questions and themes from an analytic framework as described in Section 2.4 (see below).

2.3 Phase Two of the Evaluation

The second year of the evaluation focused on understanding the impact that the Enviroschools Programme has had for schools, communities, and student learning outcomes, and the contexts that best enable or hinder such outcomes. In this second phase of the evaluation we gathered data from members of school communities through surveys, and case studies involving interviews, document analysis, and observations. This involved:

- A questionnaire for a national sample of enviroschools lead teachers
- Two case studies with multiple interviewees at a primary school and an area school
- Analysis of documents relevant to EfS as provided by interviewees
- Observations around the case study schools.

Lead teacher questionnaire

The questionnaire asked enviroschools lead teachers to respond to questions about their own, their school's, and their students' experiences and outcomes in relation to support from the Enviroschools Programme. The questionnaire (See Appendix 1B) was divided into six areas:

- Background on the teacher's role and the school's involvement in EfS.
- The nature and usefulness of the support they/the school received from the Enviroschools Programme.
- The impact of this support on teaching and the school.
- Student outcomes achieved through EfS.
- The match between EfS and education directions for New Zealand.
- Support and barriers to EfS development.

Our questionnaire design was informed by:

- Our evaluation questions and analysis framework.
- Enviroschools documents and their service agreement.
- Interview and survey material from Phase One of the evaluation.
- NZ literature and policy (including, the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999), EfS Key Messages (Ministry of Education, 2007b), *The New Zealand Curriculum* (Ministry of Education, 2007a), Ka Hikitia (Ministry of Education, 2008), the Environmental Education Evaluation of 2002–3 (Bolstad, Cowie, & Eames, 2004), See Change (Parliamentary Commissioner for the Environment(PCE), 2004).
- International EfS literature for example, Ferreira, Ryan and Tilbury (2006), and Gooch, Rigano, Hickey and Fien (2008).
- Professional development literature, including Guskey (2000, 2002) and Timperley, Wilson, Barrar, and Fung (2007).

Data was obtained from the Enviroschools national office in October 2008 showing that 419 schools were registered in the programme. Of these 180 schools were also on the national EfS database as schools that EfS advisors had worked with. As the total numbers of the national EfS database were smaller than on the Enviroschools database, these 'in common' schools were removed from the Enviroschools sample. From the remainder 194 schools were randomly selected for the survey, and a questionnaire was sent to these, addressed to the Enviroschools lead teacher. A response was received from 60 schools, which gave a response rate of 31 percent. This is a rather low return rate but does represent a normal rate from an unsolicited survey. The time of year of administration of the survey (in Term 4) was possibly a factor in the return rate. The responses represented the following:

- 52 (87 percent) were completed for a primary/intermediate school, 6 (10 percent) for a secondary school, and 2 (3 percent) for composite schools, which roughly matches the overall proportions in the Enviroschools Programme.
- Just over one tenth of the schools (12 percent) had been doing some form of sustainability or environmental education for less than two years, almost half (47 percent) for between two and five years, and 93 percent for no longer than ten years. This latter figure may reflect the growth of the programme since 2001.
- Over 80 percent of schools responding (84 percent, 49/58) reported that they had had support from the Enviroschools Programme for more than one year and 29 percent reported having support for more than 5 years.

- Respondents reported that at least one teacher at their school had had support from the Enviroschools Programme for less than a year (10 percent of respondents), between 1–4 years (50 percent) or more than 5 years (30 percent²).
- One half (50 percent) had received support from another EfS provider or programme, including the Department of Conservation, a regional or city council, and community environmental bodies.
- Over 90 percent (91 percent) of the surveys were completed by a designated EfS lead teacher, with the average time in the role being 3 years. Of the respondents 53 percent were classroom teachers, and 84 percent of these reported having no leadership role in their school. Almost a third (32 percent) reported being senior managers such as principals and deputy/associate principals.
- Respondents were experienced teachers with 55 percent (33/60) having at least 16 years experience, and only 7 percent (4/60) having less than 5 years experience. The respondents reported less time of personal involvement in environmental/sustainability education, with 87 percent (52/60) having been involved for no longer than 10 years.

Case studies

Two case studies were also selected from the Enviroschools database. They differed from one another in terms of primary/secondary/composite, city/small town, decile, ethnic mix, and involvement with Enviroschools (see Table 2 below). Obviously two schools cannot be considered representative, but they did provide an important insight into EfS developments within a given context and helped us to gain a deeper understanding of some of the quantitative survey patterns.

Table 2: Case study school details

	School details	Method
Case Study One: Primary School	<ul style="list-style-type: none"> • Large city • Decile 9 • Silver Enviroschool • Predominantly NZ European and Asian 	<ul style="list-style-type: none"> • Individual interviews with: • Principal • EfS lead teacher • 4 other teachers • Caretaker • Enviroschools facilitator • Focus groups with: • 2 students (Y5 and Y6) • 3 students (Y6)
Case Study Two: Composite school	<ul style="list-style-type: none"> • Small town • Decile 3 • Bronze Enviroschool • NZ European/Māori mix, including immersion unit 	<ul style="list-style-type: none"> • Individual interviews with: • Principal • EfS lead teacher/DP • 4 other teachers • BOT Chairperson • Enviroschools facilitator • Focus groups with: • 3 Envirogroup students (Yr 12) • 3 random students (Yr 10)

Up to two days were spent in each school gathering data. We designed several interview schedules tailored to different roles in the school (e.g. principal, student, EfS lead teacher, etc). Each covered the following areas:

- Background questions on the participant

² The remainder (10%) did not know or respond, except for 2 who did not think their school had received Enviroschools support. This suggests either they were not aware of another teacher attending professional development or that they had intended to work with the Programme this year but had not been able to for some reason. We kept them in the sample for completeness.

- School practice in sustainability and EfS
- General outcomes of the Enviroschools Programme in the school
- Specific outcomes of the Enviroschools Programme in the school
- Support and barriers for delivery of the Enviroschools Programme and EfS

Each interview or focus group lasted up to one hour, were audio recorded and transcribed. Transcripts of individual interviews were sent to the participants for verification where requested. The case study schools were offered two teacher release days to allow staff time to participate. In addition data was gathered through observations around each school and document analysis. Whilst each case represents a story in itself, our intention in this evaluation was to provide depth to our findings by looking across the cases. As such our analysis and data presentation focuses below mainly on cross case themes. We provide a short case story on each school to give a more holistic view of findings in each case.

2.4 Analysis

Data analysis was conducted through content analysis that addressed the evaluation questions and themes from an analytic framework described in the next section.

Whilst data was gathered separately for the evaluation of each initiative, the evaluation team met regularly to discuss data, and review the analytic framework which was guiding the analysis and interpretation of the data. This process strengthened our understanding of the framework and how it could be applied to each initiative and across all initiatives.

EfS is an area which is constantly shifting³, so it is important not to hold too tightly to exact/specified points of change to measure an initiative against, and instead look at the big picture and principles of change⁴. We therefore developed the following analysis framework to guide our data collection and overall synthesis of findings. The framework directs our focus towards national and international thinking about EfS, the nature of the initiatives as professional development programmes (as suggested by their contracts with the Ministry of Education), and the unique New Zealand context.

Current international thinking regarding EfS in schools emphasises transformational systems thinking (Jickling & Wals, 2007; Sterling, 2001), whole school approaches (Malone & Tranter, 2003; Tilbury & Wortman, 2005), cultural inclusiveness, and participatory action-taking (Blanchet-Cohen, 2006; Jensen, 2002). Transformational learning advocates the need for change towards more sustainable behaviour and promotes critical thinking to understand the underlying reasons or causes for our current relationship with the environment and encourages thinking towards a sustainable future. Systems thinking recognises the need to take a holistic approach to examining problems and processes that seeks to understand the connections between various influences. Whole school approaches emphasise the need to engage the whole community in EfS and to participate democratically in education that empowers learners. Cultural inclusiveness promotes the incorporation of indigenous ways of knowing and doing in EfS, and recognises the interconnectedness of the world's peoples. Finally, participatory action-taking suggests that education must lead to an ability to act with knowledge and intention, to develop what is known as action competence, with reference to the environment and a sustainable future. Both national and international conceptions emphasise cultural inclusiveness. A uniquely New Zealand approach to EfS is expected to support inclusion of Māori perspectives in respect to the tangata

³ Later in the report we explain that, in addition to changing understandings of sustainability itself, this evaluation was conducted at a time when key documents related to EfS were in transition (eg, the revised New Zealand Curriculum was released).

⁴ For example, different things can be important to different people developing EfS, even if there is some jointly held goal or definition of EfS.

whenua, to respect other cultures, and focus on local and regional approaches to sustainability. *The New Zealand Curriculum* (Ministry of Education, 2007) and the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999) both acknowledge the central importance of the Treaty of Waitangi in our school-based education. The Curriculum also emphasises the under-pinning roles of the principles of cultural diversity and inclusion.

In making overall evaluative comments, we paid particular attention to transformational learning, systems thinking, cultural interfaces, and professional learning, as well as considering the interconnections between them (within the Enviroschools Programme itself as discussed in this report, and across all three initiatives as a fuller EfS system as discussed in our overview report). Figure 1 below illustrates our thinking for this framework.

Figure 1: Analytic framework diagram

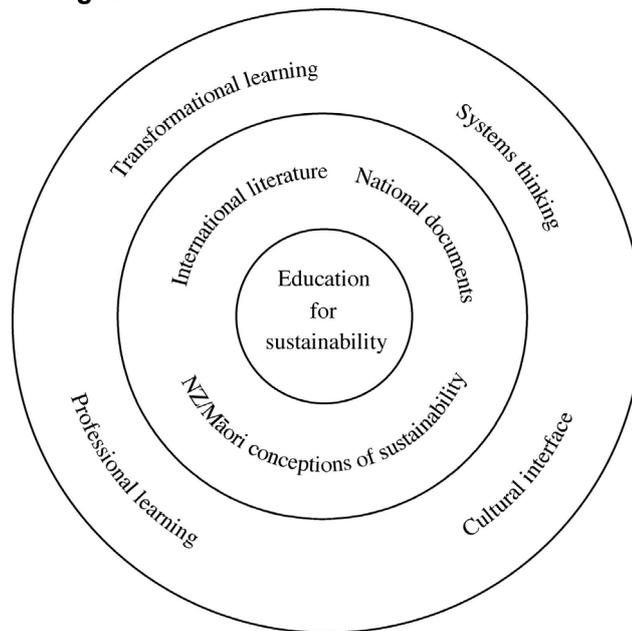


Table 3 below summarises this framework and its relation to what we see as some of the important intentions of school-based EfS, in relation to EfS generally and the Enviroschools Programme specifically.

Table 3: Analytic framework

Broad area	Elements (principles/outcomes)
Transformational learning—learning that leads to thinking, acting and being that fosters sustainability; emphasising that EfS is about change both in educational and sustainable practices tied to the needs and responsibilities of the 21st century.	<ul style="list-style-type: none"> • Facilitative teaching • Student-centred learning • Participatory action-taking • Critical thinking and reflection • Clarifying values, ethics, and assumptions • Change towards sustainable practice
Systems thinking—emphasising the holistic and interconnected nature of EfS and a deep reflection on the underlying causes of problems and development of solutions.	<ul style="list-style-type: none"> • Whole school/systems approach • Democratic decision making • Strong school-community links • Interconnectedness of people and the environment • Integrating curriculum (inc learning areas and key competencies)
Cultural interface—those complex, dynamic spaces between different cultural ways of knowing/being/doing, emphasising the interrelationships between cultures in New Zealand, especially between Western culture and Māori culture.	<ul style="list-style-type: none"> • Recognising multiple worldviews • Negotiating between worldviews • Creating shared language • Tracing genealogies of knowledges • Honouring the Treaty of Waitangi
Professional learning—emphasising the focus of the three initiatives on a professional development process to develop EfS professional learning communities.	<ul style="list-style-type: none"> • Shared visions • Reflective conversations • Deprivatisation of practice • Joint planning and curriculum development • Distributed leadership • Support for changing practice

Data analysis with this framework in mind was conducted in a number of ways. Qualitative data gathered through interviews, document analysis, observations and open responses to the questionnaires were content analysed according to themes suggested by the evaluation questions, the analytical framework and those that emerged from the data. Quantitative data gathered through closed questions in the questionnaires were data entered and statistically analysed by the Statistical Data Management Team at the New Zealand Council for Educational Research (NZCER) using SAS⁵. Graphs were generated using R⁶. Open responses in the questionnaires were data entered by the same team.

The evaluation findings are now presented under each of our three evaluation questions, which have been tailored to refer specifically to the Enviroschools Programme.

⁵ SAS Institute Inc (2007). Version 9.1.3 of the SAS System for Windows. Cary, NC, USA., SAS Institute Inc.

⁶ R Development Core Team (2008). R: A language and environment for statistical computing. Vienna, Austria, R Development Core Team.

3. Enviroschools Programme alignment with key messages, goals, and intended outcomes of EfS

In this chapter we address our first evaluation question:

- What are the key messages, goals and intended outcomes of school-based EfS and how does each initiative align with these?

We examine the key messages, goals and intended outcomes of school-based EfS national and international literature and look for the alignment with these in the Enviroschools Programme. Data sources for this evaluation focus were primarily Enviroschools documentation and interviews with Enviroschools staff. We have structured the analysis to answer three specific sub-questions:

- What key motivations and developments have informed and supported the initiation and growth of these initiatives?
- How do the goals and intended outcomes of each initiative align with or extend internationally-promoted and New Zealand governmental “Key Messages” for EfS in schools, and specifically New Zealand/Māori conceptions of sustainability?
- How have the goals and intended outcomes of each initiative aligned with or extended the “aims for Environmental Education” outlined in the *Guidelines for environmental education in New Zealand schools* and other government guiding documents in school-based education for sustainability?

In this evaluation we have done our best to keep in view outcomes in terms of Enviroschools Programme staff views, contractual obligations, and guiding documents. As argued earlier, we are acknowledging the relevance of a somewhat ecological approach to this evaluation and as such it is important to note that it was conducted in a time of transition. During 2007–8, when the data in this report were collected several changes were in process:

- The *New Zealand Curriculum* (2007) was released, replacing the previous *New Zealand Curriculum Framework* (2003) and associated curriculum documents.
- A consultation process began to revise the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999) to align them with the new curriculum.
- The Ministry of Education incorporated all of its major EfS contracts within the national EfS reference group, which was previously solely dedicated to the School Support Services NEfS team.
- National rhetoric at central government level raising the consciousness of the public towards sustainability.
- International imperatives such as unstable oil prices and a developing economic crisis, and the New Zealand’s commitments to *Agenda 21* and the Decade of Education for Sustainable Development.

3.1 Development of the Enviroschools Programme

Growth and development

EfS grew from early beginnings in the 1960’s and 70’s in response to growing awareness of environmental problems around the world. A series of international meetings focussed on the need for environmental education that would lead to more knowledge about these problems and hence actions to resolve them. A growing realisation of the inseparability of environmental problems from human endeavour culminated in a re-orientation of thinking towards sustainable

development at the Rio Earth Summit in 1992 (UNCED, 1992). Representatives of the Hamilton City Council attended the Rio Summit and committed the city to work towards a sustainable community.

The guiding document emerging from the Rio Summit, *Agenda 21*, placed a strong emphasis on education as a means to achieving sustainable development. Subsequently, representatives from the Hamilton City Council, Environment Waikato, the Department of Conservation and University of Waikato developed a pilot programme called Eco Schools in 1993. The programme soon changed its name to the Enviro-school Project to avoid a clash with another initiative and it was trialled in three Hamilton schools. A monitoring team provided a baseline survey (Keown, McGee, & Carstensen, 1995), and a follow up study at the end of almost three years of the project, and concluded that it was a qualified success (Keown & McGee, 1999). The researchers found that there was some development of school policy, some environmental improvements in the school grounds, and that whole school teaching was very effective in developing student environmental knowledge and awareness (p. 64). They were concerned by the lack of leadership and resources to sustain the project in schools. They recommended the establishment of an environmental education officer as a facilitator and support person for Enviro-schools, and a programme of professional development for all school staff.

In 1997, one of these recommendations became reality with the appointment of a coordinator at the Hamilton City Council, with a mandate to foster development of (now called) Enviroschools. The new coordinator found that “there wasn’t really much left ... of that pilot, so it was pretty much starting from scratch”. She teamed up with one of the teachers at one of the pilot schools to develop a framework for the programme.

Development of the programme was slow going to begin with as those involved grappled with the lack of understanding about sustainability amongst decision-makers. There was a perception that the city council seemed to be more interested in outputs and logos than establishing operating principles. As knowledge and connections grew, the programme grew organically through relationships with Te Mauri Tau and others. Te Mauri Tau is a whānau-based organisation that focuses on developing envirocommunities through te reo and tikanga and use drama, art and training processes.

The relationship with Te Mauri Tau helped develop connection with Māori perspectives, emphasising New Zealand’s indigenous views, as promoted in *Agenda 21* (UNCED, 1992). The development of a kaupapa to guide planning and operations was seen as a key step, as was a decision to use a regional support structure. At this point, a lack of funding meant much of the work was done on a voluntary basis, with the programme held together by the goodwill of those involved. Gradually funding became available through the Sustainable Management Fund (MfE) and the Tindall Foundation.

The Sustainable Management Fund grant was used to develop the Enviroschools Kit and trial it with three local councils, namely the Hamilton City Council, Environment Bay of Plenty and Matamata Piako District Council. Local government picked up the programme, as some key people in these organizations could see the connection between education and environmental improvements, which could help them achieve their environmental objectives. Schools were offered a three year facilitation programme to get them up and running based on the Enviroschools Kit. The kit provided a structure for professional development and delivery of environmental education in schools. Other councils were then approached with a view to their involvement in the programme. Environment Waikato became involved and hosted the facilitated programme in the Waikato, with financial contributions from some district and city councils allowing employment of facilitators on contract.

At around the same time, the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999) were produced, and a professional development (PD) programme enacted by the Ministry of Education to support them. There were informal linkages established between this programme and Enviroschools, which were mutually informing. The Guidelines PD programme and the Enviroschools Programme, however, evolved independently,

supported as they were by central government on the one hand, and local government and private enterprise on the other. This created some confusion in schools and in the environmental community about the different programmes, which was mitigated somewhat by a developing communication relationship between the leaders of the two programmes. Around this time, the Enviroschools Programme spread to Auckland through the Auckland Regional Council and the North Shore City Council, also due to relationships developed with Enviroschools office staff.

In 2003 the Enviroschools Foundation formed a Board of Trustees, providing a more formalized governance structure. As the programme grew (see Table 4 below), annual Hui were instigated to allow schools to share ideas and experiences.

Table 4: Growth in number of enviroschools between 2001 and 2008

	2001	2002	2003	2004	2005	2006	2007	2008
Number of schools	12	18	120	160	279	419	534	639

The growth in the programme was supported by the Tindall Foundation funding, and when that ended it was replaced by a new funding partnership with Vodafone in 2005. This funding allowed some stability as the national office staff could now work fulltime and be paid for the work they did. As a national office staff member noted “it was a huge boost to people in the programme to be finally recognized for what they do”. This stability helped see an even more rapid growth in the numbers of enviroschools over 2005 and 2006, supported by increased commitments by councils in regions from throughout New Zealand.

Then in 2006, the Government pledged funding for four years (2007–2010) for the Enviroschools Professional Development Programme as part of a funding package supporting a number of environmental education initiatives. This has allowed the national office to hire more staff and provide more service to support the development of the programme nationwide. The programme continues to grow, with 639 schools registered as enviroschools at the end of 2008.

Current Enviroschools Programme Principles and Intentions

Analysis of Enviroschools documentation provides a view of the principles and intentions that underpin the programme. The programme is guided by principles embodied in a kaupapa or ‘touchstone’. The kaupapa is described in the Enviroschools Handbook (Enviroschools Foundation, 2008), the Enviroschools Kit (Enviroschools Foundation, 2009) and on the Enviroschools website (Enviroschools, 2009) as reflecting that enviroschools:

- **have a sense of place** where “nature and people are nurtured and the whole school environment is a learning resource”.
- **are participatory** in recognising that all members of the school community “have roles in actively creating and caring for their school”.
- **have a sense of purpose**. “Students are inspired to be creative and become competent to make decisions and take action in their community” and teachers and other adults maximise the potential for environmentally friendly practices in their schools and communities.

Within this kaupapa, five main principles are emphasised that underpin the work in the programme. These are:

- **Sustainable communities** act in ways that nurture people and nature, now and in the future.
- **Learning for Sustainability** is an action-focused approach to learning that engages us in the physical, social, cultural and political aspects of our environment.

- **Genuine student participation** is from their own unique and creative perspective. Including young people in decision-making and action empowers them to be active environmental citizens for life and enriches the development of the whole school environment.
- **Māori perspectives** and knowledge of the environment offer unique insights built up over time in this country. Including Māori perspectives enriches learning and honours the status of indigenous people in this land.
- **Respect for the diversity of people and cultures** is integral to achieving a sustainable environment in New Zealand that is fair, peaceful, and cooperative and makes the most of our rich cultural traditions (Enviroschools, 2009).

The Enviroschools Programme recommends a whole school approach to sustainability in schools. This approach is seen to have four dimensions representing the key areas of school life. These are:

- **Physical surroundings**—that are environmentally friendly, healthy places that promote education for sustainability.
- **A living curriculum**—that enables students and teachers to critically reflect on their personal and community values and behaviours towards sustainability issues in their school.
- **Organisational management**—that emphasises a democratic decision-making process that respects equity and diversity and creates a sense of ownership and belonging.
- **Operational practices**—that promote sustainable use of resources which creates a healthy environment for learning (Enviroschools, 2009).

With these principles and intentions in mind, we now examine their alignment with New Zealand and international conceptions of EfS. This alignment is discussed firstly with government guiding documents in school-based EfS and the *Key Messages* from Government regarding EfS. Alignment with international conceptions of EfS and specific New Zealand/Māori conceptions of sustainability are discussed in the following sections.

3.2 Alignment of the Enviroschools Programme with the aims for EfS

This section examines the alignment of the goals and intended outcomes of the Enviroschools Programme with EfS ideas at several levels of government. Multiple government and national documents outline various specific formal goals and intended outcomes for school-based EfS: EfS Government Key Messages; the Ministry of Education Service Agreement for the Enviroschools Programme; the New Zealand Curriculum; the Guidelines for Environmental Education in New Zealand Schools; Ministry of Environment and Parliamentary Commissioner for the Environment documents; and international agreements that New Zealand has signed up to. We will briefly summarise each and look at how they align—in theory and in practice—with the broad principles and outcomes of school-based EfS as a whole.

EfS Key Messages

The following *Key Messages* for the Government's purpose in EfS were espoused in the Request for Proposals for this evaluation:

- Education is a key part of the government's strategy to protect and enhance the environment.
- Education for Sustainability will have social, cultural, economic and environmental benefits for all New Zealanders.
- Education for Sustainability links to New Zealand's developing image of a socially and culturally inclusive society committed to protecting and enhancing our environment.

- Education for Sustainability requires effective partnerships between a range of government and non-government organisations.

These key messages are affirmed by the Ministry of Education's Statement of Intent 2007–2012 (Ministry of Education, 2007c) that recognises that education is “critically important” for New Zealand's long-term sustainable development, and that the Ministry of Education can support sustainable practices through influencing curriculum development (p. 17).

Examination of Enviroschools documents shows strong alignment with these ideas through the kaupapa, principles and the approach to a sustainable school. In particular, the emphases on active participation in protecting and enhancing our environment, and the role of partnerships that promote inclusion on many levels are important connections to these documents. The Enviroschools Programme emphasises the centrality of the community, empowerment of students and an inclusive society.

A feature of the Enviroschools Programme from its early stages has been its emphasis on partnerships. These partnerships are evident in the strong links with Te Mauri Tau in the training of facilitators and the development of resources to incorporate Māori perspectives, both within the Enviroschools Kit and Handbook, and in the recent development of He Kete Taiao, a kit for kura kaupapa written in te reo. Partnerships also exist or have existed between the Enviroschools Foundation and central government through the Ministry of Education, the Ministry for the Environment and the Department of Conservation, local government through the regional coordination and facilitation, and a range of non-government organisations such as The Tindall Foundation, The Vodafone New Zealand Foundation, Holcim, Genesis Energy and Firestarter (an Australian NGO) who provide funding and resources. New partnerships were developed in 2007 with the Building Research Association of New Zealand, the National Energy Research Institute, and Connected Media and the Global Education Centre. Significant partnerships occur as well with the School Support Services EfS advisors and the Mātauranga Taiao initiative, which are discussed later in the report.

When asked about the kaupapa, the staff of the national office, the regional coordinators and facilitators, and other interested parties expressed strong identification with the kaupapa and a belief that it was central to the success of the programme. As one facilitator said, “I think the Enviroschools kaupapa is strong, it sits well with me”. They also demonstrated a cohesive understanding of the kaupapa, highlighting the empowerment of students to work towards a sustainable world with their school and its wider community, and the interconnectedness of people and their world as important features.

When asked about how the Government's Key Messages about EfS supported their work, almost half of the facilitators (45 percent, n=31) responded that they never referred to them, and just over half (51 percent, n=31) felt that they didn't know how useful they were to schools. Comments from interviews indicated a lack of clarity as to what the Government's Key Messages for EfS were. The survey of the EfS teachers asked respondents to comment on the support they felt they received in their EfS by government policy. Just over half of the respondents to this question (58 percent, n=41) rated the support as good, while 39 percent rated it as poor. This indicates a need for more clarity from the Government in how they are supporting the principles of EfS.

Ministry of Education Service Agreement for Enviroschools Programme

The Ministry of Education made a service agreement with The Enviroschools Foundation in August 2006. It specified a professional development programme that would be delivered from 1 January 2007 to 30 June 2010. The main project areas in the agreement and their paraphrased goals are:

Table 5: Goals of the Enviroschools Programme as described in the Ministry of Education Service Agreement

	Paraphrased outcomes
National Coordination	Strategic direction and growth, relationship maintenance and growth, support for regional coordinators, and raising the profile of environmental education for sustainability.
Regional Support	Professional development for Enviroschools facilitators and staff, and for teachers, and resources to assist schools on their sustainability journey.
Programme Development	Involvement of students at all levels and all school types in Enviroschools, providing continuous pathways for student in EfS, integration of EfS into school buildings and operations, and gather evaluation data that reflects progress of Enviroschools participants.

Data collected through this evaluation shows good alignment of the programme with these goals. Enviroschools documentation indicates an interest in developing partnerships, fostering regional coordination and promoting EfS. The Enviroschools Kit (Enviroschools foundation, 2008a) and the Enviroschools Scrapbooks (eg, Enviroschools Foundation, 2008b) are designed as resources for use by Enviroschools facilitators with school staff. Recent Milestone reports from the Enviroschools Foundation indicate a desire to engage more with kura kaupapa, to focus on initiatives that promote consideration of sustainability in school buildings and operations, and to enhance data gathering regarding the outcomes of the programme.

Data collected also shows support for these directions from the Enviroschools staff and enviroschools themselves. When asked in interviews and a survey about the purpose of their programme, Enviroschools staff highlighted:

- the empowerment of young people to bring about change towards a more sustainable world
- the integration of sustainability ideas throughout the curriculum, people and practices within a school
- the role of schools as part of a sustainable community
- the development of self-learning communities with a deep connection to each other and the environment
- the environmental, social, spiritual wellbeing of the world
- that of the Enviroschools facilitators, 93 percent (28/30) felt that they understood the purpose of the Enviroschools Programme at national level well or very well, and 100 percent (29/29) felt they understood the purpose at a regional level.

These conceptions align well with the espoused intended outcomes and the Ministry's agreement, and demonstrate a consideration of transformational learning and systems thinking. When the enviroschools themselves were asked what they thought the purpose of the Enviroschools Programme was, the school staff in the case studies highlighted:

- making children aware of their environment
- teaching children how to care for the planet
- creating a shift in thinking towards sustainability.

These responses focussed more at the student level, as you might expect from teachers, and there was less of an obvious emphasis on the systems thinking that was apparent in the Service Agreement and in the responses of the Enviroschools staff.

The New Zealand Curriculum

This study occurred at a time of transition from the *New Zealand Curriculum Framework* (Ministry of Education, 1993) to *The New Zealand Curriculum* (Ministry of Education, 2007a). The 1993 framework made no mention of EfS, and objectives focussing on the environment or sustainability were restricted to the science, technology, social studies and health learning areas. The 2007 curriculum represents a significant change in which EfS is included as a key theme that schools can choose to include in their curricula, and there is a direction to encourage the exploration of the value of ecological sustainability. Furthermore, schools are encouraged to accept more autonomy in their curriculum decisions, working with their communities to deliver education most relevant to them. There is also a stronger emphasis on lifelong learning and the development of key competencies, most of which are completely in alignment with concepts of student development within EfS. Finally, there remains some focus on environment and sustainability in the learning areas of science, technology, social sciences and health.

The Enviroschools Programme re-wrote its Enviroschools Kit in 2008 (Enviroschools Foundation, 2009), partly in response to the new curriculum. The new kit emphasises an action learning process, which focuses on school experiences, and facilitates student action-taking and reflection. This process also aligns well with *The New Zealand Curriculum*, in particular with the principles expressed in this document (p. 9), which support the notion of sustainable communities and respect for diversity.

The Enviroschools staff overall felt positively about the likely impact of *The New Zealand Curriculum* for development of EfS, believing that the Curriculum was likely to provide more opportunities for EfS. As this evaluation of their views was conducted shortly before the release of the Curriculum, many staff expressed the hope that it would create a stronger mandate for EfS than the previous Curriculum Framework.

The New Zealand Curriculum was released in November 2007 and the evaluation of enviroschools conducted after this point in 2008. Staff in the two case study schools were strongly supportive of the potential for enhanced delivery of EfS with the curriculum, believing that the goals of the Enviroschools fitted very well with the new document. As one case study principal said, “The new Curriculum will help us a huge amount I am sure, and I think that we will be, we are as a kura in a very powerful position to move forward on the new curriculum and I think in a very positive space in terms of where we are located in the community, and I think there is a great deal of goodwill in terms of enviro and sustainability so we are in a very useful place and the Enviroschools Programme helps to support that and to help us to articulate that role”. In the survey of enviroschools, 63 percent (38/59) respondents reported that *The New Zealand Curriculum* was useful or very useful in developing EfS in their school, and only 3 schools reported not using the curriculum in their EfS planning.

Environmental Education Guidelines

In 1999, the Ministry of Education published the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999). This document took its cue from mid 1990’s international conceptions of environmental education and New Zealand’s educational and cultural milieu. The Guidelines specify aims (see Table 6 below), dimensions and concepts to help teachers plan for environmental education in their schools. There is a significant emphasis on sustainability, action-taking, interconnectedness and Māori world views. At the time of writing this report, there are calls for the Guidelines to be reviewed to better align them with *The New Zealand Curriculum* and to reflect changing international conceptions of EfS (Chapman & Eames, 2007).

Table 6: The aims of environmental education are for students to develop:

Number	Aim
Aim one	Awareness and sensitivity to the environment and related issues
Aim two	Knowledge and understanding of the environment and the impact of people on it
Aim three	Attitudes and values that reflect feelings of concern for the environment
Aim four	Skills involved in identifying, investigating, and problem-solving associated with environmental issues
Aim five	A sense of responsibility through participation and action as individuals, or members of groups, whānau, or iwi, in addressing environmental issues

The Enviroschools documentation has aligned strongly with the Guidelines, with the Enviroschools principles of environmental education, student participation and Māori perspectives all featuring clearly in the Guidelines. However, there is now some movement away from the Guidelines in the latest Enviroschools documents, reflecting the fact that these Guidelines are somewhat out of date. For example, the revised Enviroschools Kit and website are consistent with the new Curriculum and the evolving conception of the field towards education for sustainability. This presents something of a conundrum, as even though the Guidelines are still actively being used in many schools, they are at odds with other documentation being promoted by the Ministry of Education.

Enviroschools staff supported the use of the Guidelines in their work. Eighty per cent (25/31) of the facilitators surveyed in 2007 felt they understood the Guidelines well or very well, most (29/31) used them at least occasionally, and most (25/31) felt they were useful to use with schools. Teacher respondents in 2008 noted similar levels of usefulness, with 70 percent (41/58) of respondents stating that the Guidelines were either useful or very useful to them. One teacher in the case study noted, “I think that [Guidelines are] excellent, and I think it is quite good that it sits outside because it then makes it easier for us to see it as something that should be across the subjects not just embedded, for example, in science”.

Ministry for the Environment

The Ministry for the Environment’s *Learning to Care for Our Environment: Me Ako ki te Tiaki Taiao* (Ministry for the Environment, 1998) set out seven outcomes “sought by the Government” from environmental education:

- individuals, families and communities with the knowledge, skills, attitudes and values that result in sound environmental behaviour
- the effective transfer of knowledge gained from research and good practice to those that need it
- tangata whenua have the knowledge and skills necessary to fulfil their responsibilities as kaitiaki
- the effective use of environmental education to help people and organizations understand and implement environmental and other policies
- the well-informed participation of communities in issues affecting their environment
- the effective integration of environmental education within the school curriculum integration of environmental education into business and professional education in a wide range of sectors.

Whilst this document ‘spoke’ in the former language of environmental education, clear synergies can be seen between its intentions and that of the Enviroschools Programme. This is particularly evident in the connections between individuals, families and communities having well-informed participation in environmental issues, and the integration of environmental education into the curriculum.

Parliamentary Commission for the Environment

Whilst not a government organisation per se, the Parliamentary Commission for the Environment (PCE) does represent a national voice on the environment and therefore is relevant to this discussion. The PCE's (2004) *See Change: Learning and Education for Sustainability* outlined aims and priorities and aims for EfS nationally⁷. Key principles for EfS (across and beyond primary, secondary, tertiary and non-formal education) were outlined to: have a strong values base; include critical thinking and reflective learning; be future focussed and participatory; focus on learning for life and across boundaries; and be transformative. The overall intention is that EfS will enable proactive whole systems 'redesign' (rather than reactive problem management), and ensure that we do things differently in the first place, instead of just cleaning up the symptoms of underlying problems (Parliamentary Commission for the Environment, 2004).

There is very strong alignment between the messages from the PCE regarding EfS and the Enviroschools Programme. In particular, the principles around systems thinking and transformative learning are prominent in both of them.

International agreements

The New Zealand Government is a signatory to two significant international agreements that promote EfS. These are therefore of relevance to this discussion as guiding EfS messages for this country. These agreements are:

- **Agenda 21** (UNCED, 1992) that called for education for sustainable development in schools and to which New Zealand was a signatory.
- The **Decade of Education for Sustainable Development 2005–2014** (UNESCO, 2007), for which New Zealand is a signatory, which promotes interdisciplinary and values-based learning, critical thinking, participatory decision-making and locally relevant actions.

Both of these agreements show strong alignment with the Enviroschools Programme through their emphasis on inclusion of sustainability in school curricula and practices, and encouragement of the empowerment of students and schools to participate in locally relevant issues.

3.3 Alignment of the Enviroschools Programme with internationally-promoted, and New Zealand/Māori conceptions of sustainability

Alignment with international conceptions of EfS

As noted earlier, current international thinking regarding EfS in schools emphasises transformational systems-thinking (Sterling, 2001), whole school approaches (Malone & Tranter, 2003; D Tilbury & Wortman, 2005), cultural inclusiveness (UNESCO, 2007), and participatory action-taking (Blanchet-Cohen, 2006; B. Jensen, 2002). An analysis of Enviroschools documentation and discussion with Enviroschools staff indicates clear synergy with these conceptions. The Enviroschools Programme promotes a school as an indelible part of its community, and programme staff reported strongly supporting this view. The Enviroschools Kit and Handbook articulate a whole school approach, encompassing what are seen as four key areas of school life: the physical surroundings, organisational management, operational practices, and a living curriculum. This approach supports the development of sustainable practices in schools, and the promotion of critical thinking and reflection. Importantly, this approach also links well to systems thinking, with the emphasis on the connections of the school to its environment and its community, and the integrative nature of the four aspects of school life. These documents also clearly support cultural inclusiveness with their recognition of Māori perspectives and Respect for the Diversity of people and Cultures as principles underpinning the Enviroschools Programme. Finally, the notion of participatory action-taking is seen in the principle of Genuine Student participation as

⁷ It also set out a range of recommendations that various organisations, including the Ministry of Education, were later evaluated against Parliamentary Commissioner for the Environment (PCE), 2007).

outlined in the Enviroschools documents. Further analysis of these documents revealed a coherence of these key ideas throughout them.

The people who enact the programme in schools, the regional facilitators, reported a good understanding of a whole school approach and the role of the four key areas of school life within it in a survey carried out in 2007. Ninety-seven percent of facilitator respondents (30/31) felt they understood the idea of a whole school approach to sustainability, and similar percentages were recorded for understanding of the roles of the four key areas of school life.

Alignment with New Zealand/Māori conceptions of sustainability

As previously noted, both national and international conceptions of EfS emphasise cultural inclusiveness. A uniquely New Zealand approach to EfS would therefore be expected to support inclusion of Māori perspectives in respect to the tangata whenua of this land, to respect other cultures, and focus on local and regional approaches to sustainability. This report has already described how the partnership between the Enviroschools Foundation and Te Mauri Tau has driven the incorporation of Māori perspectives into the programme. The national director explained how in the early days of development of the programme there was prolonged discussion about how to integrate the Māori and Pākehā perspectives within the programme. The involvement of Te Mauri Tau in the ongoing development of resources and provision of training has continued that process. Most recently, a new training workshop on Māori perspectives was held for facilitators in 2007, with one facilitator claiming that it was the best training they had had in the programme.

As justification for inclusion of Māori perspectives, Enviroschools staff pointed to the Treaty of Waitangi as placing an obligation to do so, but most felt it went beyond that. As one staff member noted, the programme was “supporting schools to deepen their knowledge of Māori perspectives and through that gain insights into the creation of sustainable communities through all the knowledge that is embodied in traditional Māori understandings”. There was a feeling that there are ways of knowing and being that Māori embody that are valuable to sustainability. There was also a feeling that Māori children in particular could benefit in their learning from a re-connection to these Māori perspectives. A representative of Te Mauri Tau explained that it was important to develop resources and train facilitators for work in mainstream schools as well as kura, as most Māori children were in mainstream education. She emphasised that their approach through Enviroschools was to present *a* Māori worldview, and not to claim it was the only one. She also suggested that stories can be a powerful way to relate Māori perspectives and concepts.

One of the guiding principles in the programme is that respect for the diversity of people and cultures is integral to achieving a sustainable environment (Enviroschools Foundation, 2008). Discussion with Enviroschools staff indicated good understanding of this Principle but admission that there was not much understanding of how cultures such as Pacific and Asian communities may view sustainability. Resources, professional development and appointment of facilitators who identify with these communities could help to alleviate these concerns and create stronger alignment with the Principle.

Finally, one of the cornerstones of the Enviroschools Programme is the regional focus for delivery of the programme. This allows the programme to operate within an understanding of the regional situation as the funding for facilitation is regionally-provided and hence, the facilitation process and outcomes are answerable to those funders. This means the regions can encourage a focus on their local environmental issues. The programme also clearly emphasises that schools begin their development as an enviroschool by exploring the school and creating a vision for its development. This has potential to develop unique sustainable communities that lead to New Zealand conceptions of sustainability.

3.4 Summary of alignment

In summary, this study finds that the goals and intended outcomes of the EnviroSchools Programme align very well with government guiding documents in school-based EfS, with international conceptions of EfS, and with specific New Zealand/Māori conceptions of sustainability. Firstly, this alignment is seen in its model of distributed leadership which places the focus of its work at the level of the local community. This encourages schools to be recognised as integral to their communities, and the whole to be seen as a learning partnership for sustainability. Secondly, the alignment is also seen in the focus on empowerment of students to become engaged in critical thinking and action for a sustainable future. Thirdly, the alignment is emphasised in notions of a whole school approach and an inclusive society that recognise that change in systems requires everyone to be involved.

In practice, EnviroSchools staff appear well aware of the programme's structure and also aware of aspects that need further work to improve the programme, such as further development of understanding of Māori perspectives. Staff in schools receiving the EnviroSchools Programme seem reasonably clear about the purposes of the programme but may focus less on the systems thinking that would allow them to see the complete picture of EfS.

A point to note is that whilst the programme is striving to remain current with their promotion of conceptions of EfS, there was a view expressed in the data that further development could be somewhat hampered by lack of Government clarity over their support for EfS.

4. The effectiveness of the processes and practices of the Enviroschools Programme

This section examines the effectiveness of the processes and practices of the Enviroschools Programme. We synthesise across all the data we have gathered to answer the following question on this theme.

- What and how do contexts, processes, and practices support the achievement of EfS outcomes within each initiative?

We draw on the interview and survey data that examined the perceptions of the Enviroschools staff together with the survey and case study data from the enviroschools. This section explores the programme effectiveness firstly, from the perspective of those working within the programme, and secondly, for those receiving the programme. The programme can be described as having a national, a regional and a local dimension, the latter of which constitutes the facilitation of the programme in schools. Additionally, the programme includes a facilitated programme and an Awards Scheme, which are discussed in turn.

4.1 National office

There is a national office based in Hamilton that currently houses a director, a programme manager, and a further four office staff. The national office was described by programme staff as providing direction and coordination, obtaining funding, and providing resources and professional development. One national staff member saw the national team as “having particular responsibility to understand and embody the kaupapa” and to ensure the integrity of the programme. In terms of effectiveness, the national staff were very positive about this, with one stating “It’s going amazingly, the thing that I think is going really well in the national office is that we have a team of people who are all very passionate about what they do, who are all very skilled in particular areas that seem to fit together quite well”. The financial boost provided by the Ministry of Education has led to a recent expansion in the office staff and a change to office space that was seen to allow more identity and creativity amongst the staff. A key strength of the operation of the national office was seen to be the communication channels that it maintains with all partners in the programme. Regional Enviroschools staff were very positive about the work of the national office, as one coordinator noted, “now that they have got some funding they have been able to put more time, because previously they were virtually a bunch of volunteers doing things on the smell of an oily rag and they did amazing things, but the stuff that is coming out now is of really good quality”. Much of this positive reflection appeared to be based on strong professional and personal relationships between staff. The facilitator survey revealed that 29/31 (93 percent) of respondents felt that they had an excellent or good relationship with national office staff.

4.2 The regional role

The regional dimension of the programme is built around the coordination and facilitation roles. As noted earlier, the Enviroschools Programme operates on a regional basis with the regions defined by the boundaries of the regional councils of New Zealand. Regional Coordinators coordinate the delivery of the programme in their regions through helping to recruit schools, supporting, coordinating and securing funding for the facilitation work, organising events to support their local enviroschools and linking with the national office. The regional dimension was described as the ‘backbone’ of the programme, providing a multi-agency approach that delivers diversity of people and ideas. This provides resilience in the face of change, as a national office staff member stated, “we’ve got a resilient structure and it’s the same in the natural world, if you have got lots of different components in your system it makes for a resilient structure”. It also provides access to technical experts in the environmental and sustainability fields, helping to develop networks that reach out into the schools. As one facilitator employed in a council said, “I know who the ‘travel’ person

is, I know who the ‘water’ person is, I know who the ‘waste’ person is, I can directly create those links to an expert”. The regional coordinators value the support that they receive from national office and from each other, gained through Enviroschools meetings and other events through Local Government associations. The facilitator survey revealed that 28/31 (90 percent) of respondents felt that they had an excellent or good relationship with their regional coordinator. There was, however, a realisation, both at national office level and at regional level, that the current structure being used to spread the programme into the regions could lead to dilution of the kaupapa, and this concern was seen to increase the importance of features such as the annual hui and the professional development being offered by national office (see later) to maintain the consistency of the kaupapa across the programme.

4.3 The facilitators

The regional dimension connects with the local level through employment of facilitators. The regional coordinator raises funding for employment of facilitators through lobbying of their own organisation and contributing city and district councils. Depending on the level of funding gained, the regional coordinator then employs facilitators to deliver the programme in schools (although in some areas the facilitators may be directly employed by the contributing councils). The employment of the facilitators represents an area of diversity and potential inequity within the structure of the programme. The choice of employment conditions lies with each region. The facilitator survey revealed the following breakdown for employment conditions for those responding to that question:

Table 7: Employment conditions of facilitators

	Number	Percentage (n=30)
Permanent	12	40
Fixed term	4	13
Contractor	14	47

The use of fixed term or contract facilitators may be a consequence of the uncertain nature of the funding, as this is based upon the funding that contributing councils approve through their annual planning process. This system means that the regional coordinator needs to regularly report on progress in their Enviroschools Programme, show benefits are accruing and lobby for continued or increased funding. This does provide a very tangible link between schools and their communities, but also exposes the programme at a regional level to local political support. From the facilitator’s point of view, the non-permanent conditions could provide a lack of job security, a factor that had convinced one regional coordinator to employ permanent staff whenever possible. The facilitators themselves did not comment in detail on this issue, perhaps due to its sensitivity, but there were indications that for some on contract and not part of a permanent staff, there was a lack of provision of resources and professional development, and a greater sense of isolation in their work compared to those working as permanent staff.

A further analysis of the work of the facilitators in the Enviroschools Programme as reported in the survey revealed the following information:

- 28/31 (90 percent) were women.
- 25/31 (80 percent) worked part-time in their Enviroschools role.
- Almost two thirds of those part-timers (64 percent) worked less than 6 days per month in their Enviroschools role.
- This was backed up by 56 percent of part-timers stating that they spent less than 25 percent of their total working week on Enviroschools work.

- 71 percent of respondents (n=31) had been in the role for less than two years, and the rapid expansion of the programme over those two years would have necessitated an increase in facilitator numbers.

The facilitator survey showed that nearly 50 percent of respondents (n=31) had worked as a teacher in primary schools, while a third (33 percent) had taught in secondary schools. There was some diversity in views about the need for a teacher training qualification for the facilitator's role. Staff in the national office felt that most regions had chosen to employ trained teachers in the facilitator role to satisfy these needs, but some facilitators had come from a community education or sustainable practice background. All regional coordinators interviewed felt it was desirable that facilitators were teacher trained, with one noting that they had been approached by people in the last few years seeking a facilitator's job, but that these people lacked the ability to engage with teachers. One facilitator who lacked teacher training felt that it really affected their work when they began in the role. They noted "it did affect my work at the start as I was unsure about what really happened in schools. If I had the choice, I wouldn't employ someone without teaching experience in the role of facilitator now".

The data gathered all pointed towards the facilitators as a group of highly committed, environmentally-aware people. As a national staff member said, "the facilitator is actually the key person in the whole thing. They're the link between the programme and the school, and a lot rides on who they are and what they do, and I don't know that we support them enough actually". Regional coordinators spoke of their facilitators as having different strengths which they were encouraged to share in a teamwork approach.

The facilitator survey revealed the following characteristics of the facilitators (n=31):

- 90 percent had some form of personal environmental involvement, and almost two thirds (64 percent) having membership of an environmental group.
- They are generally well qualified, with 51 percent having some tertiary education in the environmental/sustainability fields such as environmental education, environmental sciences, and resource management.
- 58 percent had at least a Bachelors degree, and 23 percent had completed some form of postgraduate study.

In an open question, the survey asked facilitators about their understanding of the purpose of their work. Interpretation of the responses revealed:

- a focus on supporting and facilitating schools towards sustainability (19/31 respondents)
- implementing the Enviroschools Programme (10/31)
- supporting a whole school approach (7/31)
- supporting action-taking in schools (6/31), empowering students and staff (5/31)
- providing resources and professional development (5/31).

A further analysis of these responses showed that the key words used by the facilitators were *support* (18/31), *guide* (9/31), *motivate* (9/31) and *facilitate* (7/31) with *provide* rating (5/31). This analysis indicates an approach by facilitators that is nurturing and encouraging rather than directive.

Finally, the facilitators were also asked about their understanding of various elements of sustainability. This was a closed question with a rating scale between 1 (very well) and 3 (not very well). The findings are shown in Table 8 below.

Table 8: Facilitators rating of their own understanding of various elements of sustainability

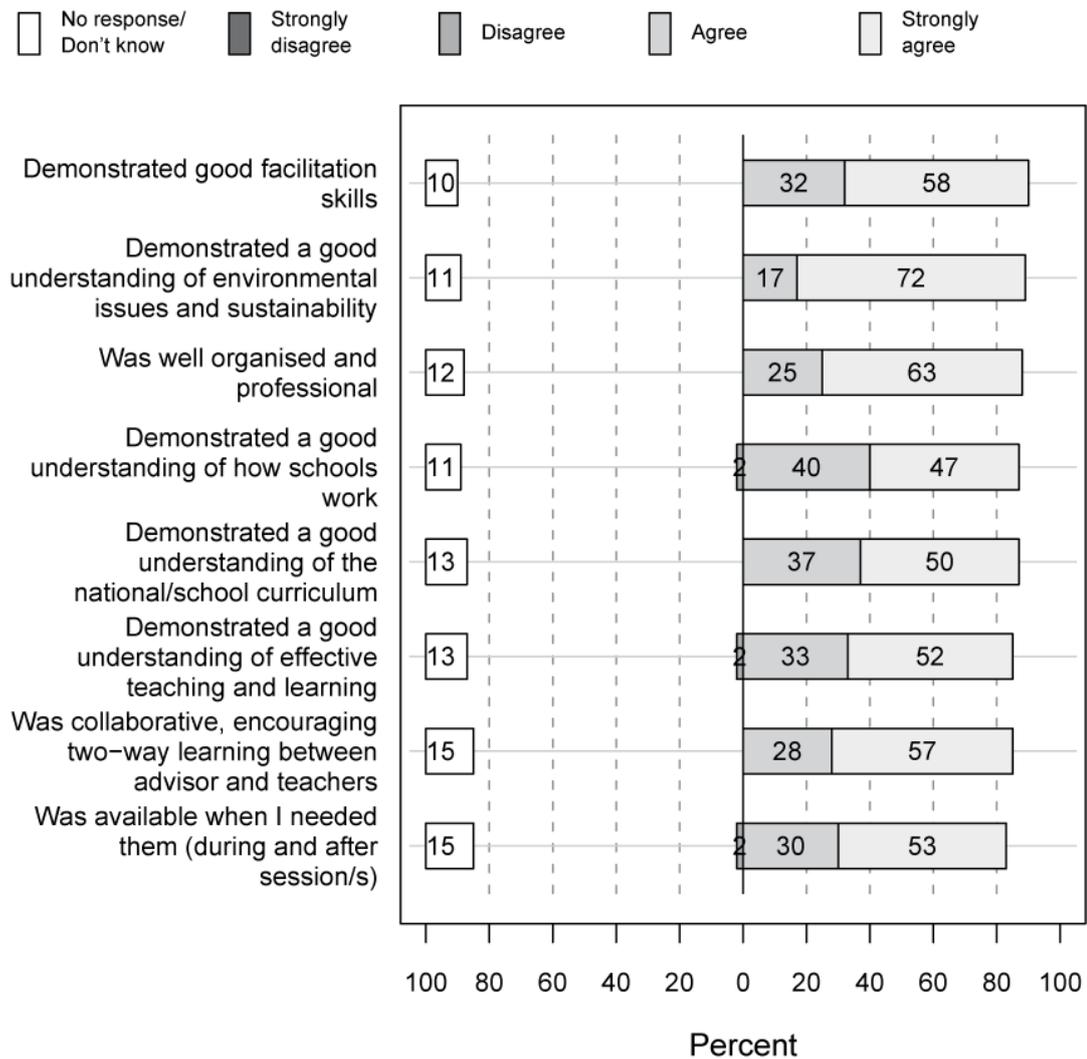
	Mean score (n=31) (1 = very well to 3 = not very well)
Environmental sustainability	1.45
Social sustainability	1.70
Cultural sustainability	1.97
Economic sustainability	2.10
Political sustainability	2.20

As can be seen, facilitators felt they had a good understanding of environmental and social aspects of sustainability, but were less comfortable with cultural, economic and political sustainability.

Generally the facilitators were very positive about their work. In particular they enjoyed seeing students engaged with issues and acting upon them (15/31), with one facilitator commenting “I enjoy working with the students and with the teachers”. They also enjoyed working in a positive and enthusiastic situation to make a difference (13/31), with a number (7/31) noting that they were doing what they believed in. This sentiment was echoed by one Regional Coordinator when they commented that working in the programme was “now part of who we are”.

Schools perspectives on facilitators

The case studies and survey of enviroschools provided some data on the role of the facilitators in the schools. Staff in the two case studies were very complimentary about the facilitators working in their schools, indicating that they provided valuable support and impetus of their development as enviroschools. This emphasis was backed up by the survey as the data in Figure 2 shows below. The data shows strong support from the enviroschools lead teacher survey for the work of the facilitators. The facilitators appeared to be particularly appreciated for their knowledge of environmental issues and sustainability and their professional approach.

Figure 2: Enviroschools lead teacher assessment of the capability of their Enviroschools facilitator

One staff member in a case study school noted that “[our facilitator has] been really helpful and in fact I think they feel rather frustrated at times that we are not moving faster” (enviroschool lead teacher). One perspective provided on the role of the facilitator was that having “those people who are involved being external to the school, it means that they are actually more likely to be engaged in the community. It is probably more difficult for a teacher to make those connections outside of the school than it is for somebody outside the school to find a connection inside the school” (enviroschool principal). This was seen as positive for the school in developing community partnerships, as is discussed further in Section 6.1.

4.4 The facilitated programme

The core of the programme over the past seven years has been a three year facilitation process. The focus of this facilitation is whole school development towards EfS and usually includes:

- Professional learning opportunities such as 1:1 professional development (PD), whole staff PD, regional workshops (sometimes in conjunction with other EfS providers such as the national EfS advisors)
- Action projects with students

Schools are either invited to apply for facilitation by their local council or they apply on their own initiative. Acceptance into the facilitation programme is on the basis of their level of readiness to engage and the availability of funding for facilitation. According to the regional coordinators, in some regions there have been more schools applying than there were funds available, which had limited the expansion of the programme.

Reasons for schools joining the Enviroschools Programme

Enviroschools staff reported their beliefs that schools want to join the Enviroschools Programme for a variety of reasons. These include:

- that schools are generally becoming more aware of sustainability and environmental issues. This can lead to an impetus to join the programme from the teachers or the students, and occasionally through pressure from the community.
- that schools wish to create a point of difference for marketing purposes. This was sometimes expressed as being without genuine regard for the intended outcomes of the programme. However, despite this rather cynical view, there was hope expressed and evidence provided that once these schools see the benefits in other ways, that they become more genuinely engaged.
- the involvement in the programme of other schools around their locality.

School staff in the case studies were similarly asked about their reasons for joining the programme. The principal of one school noted how the programme reinforced their existing awareness:

We were an enviroschool long before we joined the enviroschools programme. What the programme did was sharpen us, focus us and give us a renewed purpose, alright. So I suppose it legitimised what we believed in and provided some support for us because it is very hard to do these things and keep them going by yourself, because as soon as you lose key people, you have lost it but if you can embed it, then it has to be the next person who takes it over.

This school had a number of staff who had been with the school for some years and who had a personal passion for the environment. This had led to a natural interest in the Enviroschools Programme, which had been then fostered and enhanced by the facilitation provided. The second case study school also had a history of involvement in environmental matters and their principal said that the Enviroschools Programme “helps you to articulate and document and validate and generate goals, short term and long term goals, it invigorates and rejuvenates, I think, things that are happening and that alone justifies probably us continuing to engage”. A further perspective was gained from a Year 6 student in one of the case study schools who said “I think every school should have at least something to do with the environment. They should apply to be an enviroschool, because although it may cost money, I find it a lot better working in a school where you know that it is very natural”.

Whatever the origin of the impetus for joining the programme, Enviroschools staff were very clear on the need to get school staff on board with the idea, in particular the school principal.

The facilitation process

The three year facilitation programme was originally designed to get schools off the ground in their Enviroschools Programme, with the anticipation that as they progressed they would need less support. What has been found is that while the facilitation process has been successful in getting schools going, schools vary in their ongoing needs. A possible reason for this was explained by one facilitator who said:

I think some of the schools approached the programme in the early days as thinking a bit like it was a three year contract, because of how it was set up. Like most Professional Development programmes run over two or three year contracts, they almost ticked the box if you like.

In this view, schools who set up a waste system, or make a garden, may feel satisfied that they have ‘done that one’ and move on to other initiatives, rather than seeing the process as a permanent change in the way they operate. Another possibility is that a change of enthusiastic staff or leadership can stall the process. As a consequence, the facilitation programme is now seen as ongoing and schools can request assistance at any point in the process as they see it’s needed. This reflects what Poskitt and Taylor (2008) have recently argued about PD programmes requiring some long-term commitment to embed it into the school culture.

Professional development through facilitation

A key role of the facilitator is to provide PD at the individual and school level. A national staff member described how, in the early days of the programme, they noticed that a lot of PD was happening with individual teachers outside the school, and “that certain individual teachers would become quite skilled at things and then they’d go back into their school, but it wouldn’t necessarily filter into other teachers’ practice”. So the programme targeted PD in the school, and with the whole school. This echoes the literature’s calls for whole school approaches (D Tilbury & Wortman, 2005). In the survey, the facilitators were asked who they worked with in their schools, and Table 9 below shows the findings.

Table 9: Percentage of facilitators who reported working with different groups in their schools (n=31)

	% of facilitators who worked with the group in ALL or MOST of their schools	% of facilitators who worked with the group in SOME of their schools	% of facilitators who worked with the group in NONE of their schools	% of facilitators who didn’t answer this question
Students	65	26	0	9
Lead EfS teacher	84	10	3	3
Some teachers	68	26	0	6
All teachers	48	39	13	0
School management	58	42	0	0
Community partners eg, environmental group, councils	42	48	10	0

Just two facilitators reported working directly with parents, and the same number worked with the school caretaker, across all schools. As noted earlier, all facilitators reported working with primary schools and some of these also worked with secondary schools. A separate analysis of who facilitators reported working in secondary schools, showed similarities with this data for students and some teachers, but at least 40 percent of facilitators (n=19) reported not working with all teachers (74 percent), school management (53 percent), and community partners (47 percent) in any of their secondary schools. This finding appears to be a reflection of the difficulty of working with a whole school approach at secondary school level.

Staff in the enviroschools lead teacher survey reported that the Enviroschools facilitators tended to work mainly with teachers, and sometimes with students, mainly in Envirogroups. Work with teachers was often with individual or small groups of teachers with occasional presentations to staff meetings. As one case study teacher described “She’s really a lead person and she comes to our meetings and she’s going to spend the day with us next week to do the long term kind of plan for next year”. The survey of enviroschools teachers showed that:

- 78 percent of respondents (47/60) had had individual 1:1 PD with an Enviroschools facilitator

- 67 percent of respondents (40/60) reported attending school PD with several staff with an Enviroschools facilitator
- 70 percent of respondents (42/60) reported attending PD for their region, attended by staff from a number of schools
- 47 percent of respondents (28/60) reported attending an Enviroschools hui or Youth Jam
- 37 percent of respondents (22/60) reported receiving other forms of PD through the Enviroschools Programme such as school visits.

Apart from teachers, the respondents reported that students received Enviroschools support (in 63 percent of schools, n=60), school leaders received support in 48 percent of schools, the caretaker in 17 percent of schools and the Board of Trustees in 15 percent or 9 schools. These figures are similar to those reported above in Table 9 showing who facilitators reported working with in schools.

Facilitators were asked in the survey how they were working with teachers. Table 10 shows the findings from this question across the schools they were working with.

Table 10: Percentage of facilitators who reported working with teachers in the following ways

	% of facilitators who worked with teachers in this way in ALL or MOST of their schools (n=31)	% of facilitators who worked with teachers in this way in SOME of their schools (n=31)	% of facilitators who worked with teachers in this way in NONE of their schools (n=31)	% of facilitators who didn't answer this question
Share resources about EE/EfS	87	10	0	3
Provide environmental/sustainability knowledge	87	10	0	3
Provide ideas for teaching processes	78	19	3	0
Teach practical environmental skills	29	58	10	3
Provide course design advice	61	36	0	3
Support teacher learning communities within schools	42	23	19	16
Support teacher learning communities between schools	52	28	10	10
Provide help with EfS-relevant students assessment	6	39	39	16

There was little difference between the way facilitators worked with teachers between primary and secondary schools, although there was some indication that more help with assessment may be given at secondary level, as may be expected. A point was clearly made, however, that the way of working was highly variable, as one facilitator said,

the way I work with schools really varies, I will go into schools and work with staff, and sometimes that will be a whole staff, sometimes it will be a syndicate, sometimes it will be a key staff or management person, sometimes it will be an Envirogroup, sometimes it will be a student group.

These ways of working are compared to reported enviroschools teacher outcomes in Section 6.2.

One key issue raised by the facilitators, with respect to their work with teachers, was the challenge they faced in emphasising the time environmental change may take if students are allowed to be fully involved. In other words, the

challenge is keeping the educational process in balance with the environmental improvement aspect. As one facilitator said:

I think one of the biggest challenges I have faced is trying to get teachers to understand that they need to take time to let the children process these ideas and it really does need to be embedded in curriculum so that children are actually gaining knowledge.

4.5 The Awards Framework

The Enviroschools Programme has an awards framework integrated with the facilitated programme. The awards scheme began as a separate initiative in the Auckland region under the auspices of the Auckland Regional Council. As the funding for the facilitated programme has grown and the awards scheme has proven its value, the two initiatives have been brought together under the Enviroschools Programme banner. In their evolution in 2009, the awards are now seen as a part of the *Reflection on Change* that enviroschools undertake as part of their journey of development. They seek to encourage schools to broaden and deepen their sustainable practices. As a national staff member explained, “the way it’s working best is where schools have a commitment to become a sustainable school and along the way they go for some awards”. In this way the awards are seen as a way for schools to reflect on what they have achieved, to gain recognition for that, and to celebrate it. As another national staff member noted, “award celebrations are a fantastic thing to invite councillors and senior council staff to, and others that fund the programme, and nationally the green gold events have served in the same way in terms of being able to engage with politicians”. These opportunities have been seen to raise the profile of the programme as a whole within the community.

The awards framework works by offering awards at three levels, Bronze, Silver and Green-gold. Criteria for the awards are based on a narrative around the programme’s four key areas of school life (organisational management, operational practices, physical surroundings, living curriculum) and the five guiding principles (Enviroschools Foundation, 2009). The awards are a process of self-reflection and self-evaluation with guidance. The reflection and evaluation is conducted with the help of their facilitator (or School Support Services EfS advisor) or independently, in which evidence for their achievement within the key areas and guiding principles is examined. The reflection and evaluation process at Bronze level involves key teachers, Envirogroup students and others as well as a facilitator and these people collectively decide whether the award is merited. For the Silver Award, more staff and students are involved in reviewing the school’s progress, as well as community members and an additional coordinator or facilitator. For the Green-gold Award, the reflection team also includes an Enviroschools national team member. Table 11 shows the number of schools which have received awards from 2003 to 2007.

Table 11: Number of each type of Enviroschool Award given to schools 2003–2008

Award	2003	2004	2005	2006	2007	2008	Total awards
Bronze	10	22	82	69	90	72	348
Silver	4	7	21	34	28	47	143
Green-gold	0	2	2	1	2	1	8

Note: The total awards figure includes all schools with those awards, including those who have also got a higher award.

The interviews with the Enviroschools staff raised a number of points concerning the awards. There was strong support at all levels of the programme for the awards, with staff pointing to the benefits of providing milestones, motivation and direction for progress, and celebration opportunities. As one facilitator said, “they encourage schools to broaden and deepen their practice”, whilst another noted that “the awards are a real recognition to a lot of the [school] staff that we are actually doing okay”. There were also some concerns raised over the awards, focussing on the awards being seen as a competition, an end-point in themselves, a lack of consistency in judging across the regions, and a failure to provide

the desired outcomes. For schools that see the EnviroSchools Programme as a marketing possibility, the awards provide a further opportunity to show a point of difference. Coordinators and facilitators expressed some wariness about schools using the awards in this way. As the awards scheme spread across the country, and is being administered at the local level, there is a risk that there could develop some inconsistency in the judging. As one facilitator noted, “there appears to be no benchmarking or peer assessment between the different regions”. Finally, one facilitator expressed concern that a school could achieve an award without demonstrating achievement in all key areas, particularly in the curriculum. This facilitator expressed a belief that the curriculum should drive the programme, not just the sustainable practices, noting that schools should demonstrate that they are “aware of the four key areas, and developing their guiding principles alongside really, rather than just being driven by ‘I want a Silver Award or a Green-gold Award’, where [schools] see it as a level of achievement, rather than maybe a depth of practice”. Some of these issues appear to have been addressed in the 2009 changes to the awards process that place the onus for the award on facilitated self-judgement of a school’s achievement. The reorienting of the reflection criteria around the key areas and guiding principles and involvement of a range of school community members should help to ensure rigorous reflection and evaluation.

Perspectives on the awards were only gathered through the two case study schools, as it was thought to be too difficult to gather useful data on this topic via survey. The two schools had quite different experiences. In the primary school, there had been a recent celebration of attaining the Silver Award and a celebration with the school of which staff spoke very positively. One teacher (who became the lead teacher the following year) noted that “It meant a lot of work to me, I helped [the lead teacher] put the folder together and I see the value in that actually putting that folder together, otherwise it just gets lost”. Later the same teacher described how she felt that although getting the award was nice, it was more valuable to have the learning journey that they had undergone documented for future reference, and that the value of the awards was in providing an impetus for that. The principal at this school expressed the view that the programme is “about having this embedded as practice and I think that, and I may be wrong here, that the awards push you to project rather than embed it and I would like to see them reshaped”. She suggested a matrix of achievement that is not so strongly based on standards. The new structure may enable this.

In the second case study school, a slightly different opinion was expressed. This composite school based in a small town had achieved a Bronze Award and were considering working towards a Silver Award. One teacher expressed her perspective of seeing what the students were achieving:

It’s a hard one really because last year I didn’t think we deserved it, but I think this year we actually have worked really hard, and especially because the kids are involved and the kids are doing it. That I think we probably are a silver school, so it would be good to actually get it. I don’t think it’s that important really, but it would be nice.

The principal offered another view on the challenge of meeting the criteria in a composite school:

The school has celebrated having the bronze award and would like to win the silver and it is one of those challenges for me, I think if we were a primary school we would have nailed it. I think trying to get some of those notions right across the whole school so that we could actually claim some kind of consistency and have all the documentation looking really good, that is more difficult I think to achieve.

4.6 Summary

In summary this section has reviewed the contexts, processes and practices of the EnviroSchools Programme and reported on their effectiveness from the perspectives of the EnviroSchools staff and a sample of enviroschools. The following key points emerged:

-
- The Enviroschools Programme has a distributed leadership structure involving a national office, regional coordination and local facilitation in schools. This structure appears to allow a generally nationally-consistent approach with local interpretation.
 - The facilitators who deliver the programme in schools are a highly committed group of mainly part-time women who are knowledgeable about sustainability. These individuals appear capable of delivering sound advice to schools about changes for sustainability.
 - School staff were highly praiseworthy of the knowledge and skills of the Enviroschools facilitators.
 - Schools appear to join the Enviroschools Programme for a variety of reasons ranging from a staff, student or community-initiated concern for sustainability to a consideration of gaining a marketing edge on competing schools.
 - The number of schools joining the Enviroschools Programme has risen rapidly since 2002 and at the end of 2008 stood at 639.
 - The facilitation programme provides professional development for school staff and focuses on encouraging a whole school approach to sustainability wherever possible. Facilitators reported that their main tasks were to provide teachers with resources, environmental/sustainability knowledge and teaching ideas, and encourage student participation in decision-making.
 - An awards framework has now been assimilated into the Enviroschools Programme and provides a dimension that allows schools to chart and celebrate their progress. Whilst providing an incentive for change, there was a call to ensure the awards were fostering genuine and ongoing sustainability progress in schools, and not just providing another feature for schools to tick off as achieved. The new process developed in 2008 may well assist this but it is too early to comment more fully on this.

5. The achievement of their service agreements by the Enviroschools Programme

This section evaluates the achievement of the service agreement goals as described earlier. These are National Coordination, Regional Support and Programme Development. The Ministry of Education Service Agreement is for funding of the activities of the Enviroschools national office.

5.1 National coordination

As described earlier, the national coordination objectives are:

- Strategic direction and growth.
- Relationship maintenance and growth.
- Support for regional coordinators.
- Raising the profile of environmental education for sustainability.

As has been discussed in previous sections, strategic direction has been provided through the Enviroschools kaupapa and the formation of the Enviroschools Foundation. Strategic direction through the Enviroschools kaupapa was soundly endorsed with facilitators stating that they felt that awareness/understanding of EfS was being achieved well (32 percent of facilitators (n=31)) or progress was being made (52 percent). Governance structures and relationships appear very sound, which was backed up by facilitators claiming that they had either an excellent or a good relationship with all levels of Enviroschools staff. The Enviroschools Programme has established and maintained strong relationships with Te Mauri Tau, regional and local councils, and a range of government and corporate partners. This indicates achievement of partnership maintenance and development which was backed up by facilitators' opinions in their survey stating that this has been achieved well (48 percent of facilitators (n=31)) or progress was being made (42 percent). Finally, regional capacity increase since 2001 is shown below in Table 12.

Table 12: Growth in number of enviroschools by region (including early childhood centres)

Region	2001	2002	2003	2004	2005	2006	2007	2008
Northland	0	0	3	3	3	22	29	33
Auckland ⁸	0	5	29	43	81	106	133	148
Waikato	12	12	31	36	53	84	102	130
Bay of Plenty	0	1	11	14	22	40	53	81
Gisborne	0	0	0	0	0	0	1	6
Hawke's Bay	0	0	3	3	9	11	15	16
Manawatu-Wanganui	0	0	7	9	10	17	20	29
Taranaki	0	0	3	3	5	10	16	14
Wellington	0	0	13	19	35	52	61	63
Nelson/Marl/Tasman	0	0	0	0	6	11	23	30
Canterbury	0	0	0	8	23	26	38	45
West Coast	0	0	1	1	1	1	1	1
Otago	0	0	19	21	27	32	31	31
Southland	0	0	0	0	4	7	10	12
Total	12	18	120	160	279	419	533	639

⁸ The rapid expanse in the Auckland region from 2003 may partly have been due to the awards scheme which was introduced for the first time by the Auckland Regional Council at that time.

This table reflects the original genesis of the Enviroschools Programme in the Waikato, spreading first into the Auckland and Bay of Plenty regions before going nationwide in 2003. The three regional coordinators spoken to in this evaluation all felt well supported by the national office and were pleased about plans to increase the number of regional coordinator meetings in 2008. The final objective of raising the profile of environmental education for sustainability was difficult to determine in the scope of this evaluation.

5.2 Regional support

This section considers professional development opportunities for facilitators, and for schools within the regions, and production of resources. The objectives for regional support are:

- professional development for Enviroschools facilitators and staff, and for teachers
- resources to assist schools on their sustainability journey.

Professional development opportunities

Professional development (PD) opportunities for Enviroschools facilitators have been made available in a number of ways. New facilitators are given Level One training with Te Mauri Tau in Raglan. As a national staff member described, “Level One is quite focused on facilitators understanding what’s in the [Enviroschools Kit], the sorts of ways they can support schools, maybe even going through scenarios about what your first meeting with a school would look like?” This training was seen to provide the basics to build on through practice in the schools. Analysis of a Level One training programme reveals a mix of group-work activities, exploration of key aspects of the Enviroschools Programme, facilitation approaches, Māori perspectives, and how to work with Enviroschools staff. An Enviroschools evaluation of one training workshop found that participants enjoyed the presenters, and the relaxed supportive atmosphere, but found the days long and tiring. In the survey conducted for this study, the facilitators reported that Level One training was very useful (17/30), useful (10/30) or slightly useful (3/30). One facilitator commented in an interview that “I did do the Level One training, which was great, but it didn’t help me with knowing how to work with schools. It did give me a really good understanding of the Enviroschools kaupapa, the sense of purpose. It taught me about the why but not so much about the how”. This sentiment may be particularly apt for those facilitators who are not teacher-trained or who lack facilitation experience.

A Level Two training has been offered recently at Te Mauri Tau to help facilitators build on their experiences in schools and develop their facilitation skills. As at 2007 only 5 of the 31 facilitators reported undertaking this, as further opportunities planned for 2007 had to be postponed due to a demand for Level One training from a large number of new facilitators. All five of the facilitators who had undertaken Level Two training rated it as very useful. Other facilitators expressed a keenness to undertake this training. In 2008, ten facilitators undertook Level Two training. In May 2009, a training workshop will be held for first time with all facilitators and regional coordinators, focusing on the new Enviroschools Kit (Enviroschools Foundation, 2009). A Māori perspectives training workshop was offered at Te Mauri Tau for the first time in 2007. Ten facilitators who responded to the survey reported attending that workshop and all rated it as very useful. As one facilitator said, “I’ve just done the Enviroschools Māori perspectives training, which was the best training I have had from them. We did it at Te Mauri Tau and I really liked the way they reached back into the archaeology of Māori ways with the environment and they combined that with modern perspectives”. Eight facilitators attended the Māori perspectives training in 2008. A new PD opportunity for kaitakawaenga, Enviroschools facilitators in kura Māori, began in 2008 in which these facilitators meet at Te Mauri Tau several times a year.

Other PD opportunities within the Enviroschools Programme are the annual hui, the Youth Jam and regional workshops. The hui brings together Enviroschools staff and teachers from enviroschools to share experiences and learn more about the Enviroschools kaupapa. Analysis of the 2007 hui programme indicated a mix of plenary and group sessions, including a variety of workshops on key issues in EfS. An Enviroschools evaluation of the Hui showed much

positive feedback about the facilitation, the learning community and tours of local enviroschools, and a call for a little more free networking time. In the survey conducted for this study, the facilitators rated the Hui in general as either very useful (14/27) or useful (13/27). Comments in the interviews were also very supportive of the Hui, with one facilitator stating “I’ve been to five Enviroschools Hui and the last one was the best. I think that was because I was in a good space myself but also because they are now getting the formula right”.

The Youth Jam was offered for the first time in 2007 and aimed to bring together students and some teachers from all around the country to share experiences. The Jam featured several student-run workshops. An Enviroschools evaluation of the event provided very positive feedback from the students. The survey in this study revealed that of the eight facilitators who attended, five found it very useful, two useful, and one slightly useful. As noted above most of the teacher respondents who had attended a Hui or Youth Jam had found it a useful experience.

Finally, regional workshops are offered within regions for schools to learn more about the programme and sustainability issues. The facilitator survey in this study revealed that of those facilitators who responded to this question, most found regional workshops very useful (15/22), while some found them useful (5/22) or only slightly useful (2/22). Of the teacher respondents in their survey, 42/54 had participated in a regional workshop or event and of these 42, 52 percent found them very useful, 41 percent found them useful and the remaining 7 percent found them slightly useful.

Regions have run a number of workshops and other events to provide professional development for in-service teachers. There were no direct reports of professional development being offered to pre-service teachers in any formal way at this point. One case study principal made the following observation during discussions around how to help beginning teachers develop in EfS:

It is up to the beginning teachers, curriculum knowledge is being developed on practicum, and therefore if they have not been into a school that has an environmental focus, they are unlikely to have that consciousness, they may have had an hour or a couple of hours where it has been introduced alongside whole lots of other things, and it would have been introduced probably during science maybe, or they may have had a hint of it through social studies. But it doesn’t stand by itself and the difficulty that, I suppose all of us have got, is that much of what we do now is interdisciplinary and yet unless you have a handle on the content knowledge within a discipline and the language of that discipline and the specificity of outcomes, then you are liable to teach blanchmange.

This perspective represents a call for more pre-service education in the content knowledge associated with EfS and some of the pedagogies around how to deliver the type of interdisciplinary material that EfS is. Education for pre-service teachers in EfS has been identified as a serious gap at present (Eames, Bolstad, & Robertson, 2006), and it may be possible for the Enviroschools Programme to look for ways to contribute to closing this gap.

Overall, facilitators rated progress towards the Enviroschools objective of providing a comprehensive PD programme for facilitators as:

- achieved well (10/29 respondents)
- progress was being made (15/29)
- progress was slow (4/29).

In terms of the Enviroschools objective of enabling teachers, both pre-service and in-service, to participate in a range of PD including the Enviroschools Hui, site visits, workshops and peer mentoring, the facilitators responded that the programme had:

- achieved this objective well (13/27)
- had made some progress towards achieving it (12/27)
- was making slow progress (2/27).

Facilitators were also asked what other PD they had received that they felt had benefited their work. A wide range of PD opportunities were reported:

- Attendance at New Zealand Association for Environmental Education conferences (6/31 facilitators).
- Attendance at the EfS Teachers Conference in 2007 (3/31).
- Environmental Education Guidelines training (3/31).
- Tertiary study, regional team meetings, linking with experts and working with experts in their council workplace (all 2/31).

When asked what other PD they would like, the facilitators again provided a long list which in order of most requested was:

- facilitation/mentoring training (8/31)
- training in the new school curriculum (5/31)
- Māori perspectives workshop (3/31)
- how to work together with another facilitator in a school (3/31)
- a single mention of training in leadership development, experiential learning, permaculture and ecological buildings, project management, budgeting skills, economic and political aspects of sustainability, education theory and practice, and EfS for secondary schools.

The national office staff acknowledged that they would like to be offering more PD than they currently are in the programme. They are aware of the demand for PD around Māori perspectives, both for within kura and mainstream education, and have addressed this more recently. There is also an expanded PD programme for regional coordinators of two 2-day meetings per year, something that at least one regional coordinator interviewed reported they would value.

Resources

The key resources provided by the Enviroschools Programme to assist schools on their sustainability journey have been mentioned earlier. They consist of the Kit, the Handbook, the Scrapbooks and a variety of video and other material.

The kit was produced early on in the genesis of the programme and has undergone a recent review in 2008. It focuses on planning, learning action and how to keep the programme going in the school. It includes a range of guides and resources. It is also available in draft now in te reo, in the form of Ko Au Ko Koe, Ko Koe Ko Au, which is currently being trialled in kura, and is hoped to be completed by the end of 2009. Most facilitators (29/31) reported using the kit regularly in their work and most reported that they find the kit very useful to share with schools (24/30).

The handbook explains how the programme works and is available to all schools which enter the programme. It echoes the information contained on the Enviroschools website. A number of facilitators mentioned using the handbook in their work with schools.

The scrapbooks are produced annually and act as a reporting tool. They are evolving in content, but more recently contain information on how the programme is progressing nationally and pages featuring the work of enviroschools

from around the country, showcasing what they have been doing. These scrapbooks are provided to all enviroschools who contribute to the scrapbook and EnviroSchools staff. They are also useful for promotional purposes, as one regional coordinator explained “I think the scrapbooks are incredibly useful. I use them a lot to explain to people what EnviroSchools is about and say this is what children are actually doing in schools, because it is quite difficult to explain to a non-educator”.

A recent addition to resource production was the Energy-efficient school manual produced in collaboration with NERI and EECA.

Facilitator use of resources

The survey of facilitators asked them about their use of other resources in their work with schools. Table 13 shows their responses.

Overall facilitators rated progress towards the EnviroSchools objective of ‘providing a range of resources to assist schools at different stages of their sustainability journey’ as achieved well (14/29 respondents), progress was being made (11/29) or progress was slow (4/29).

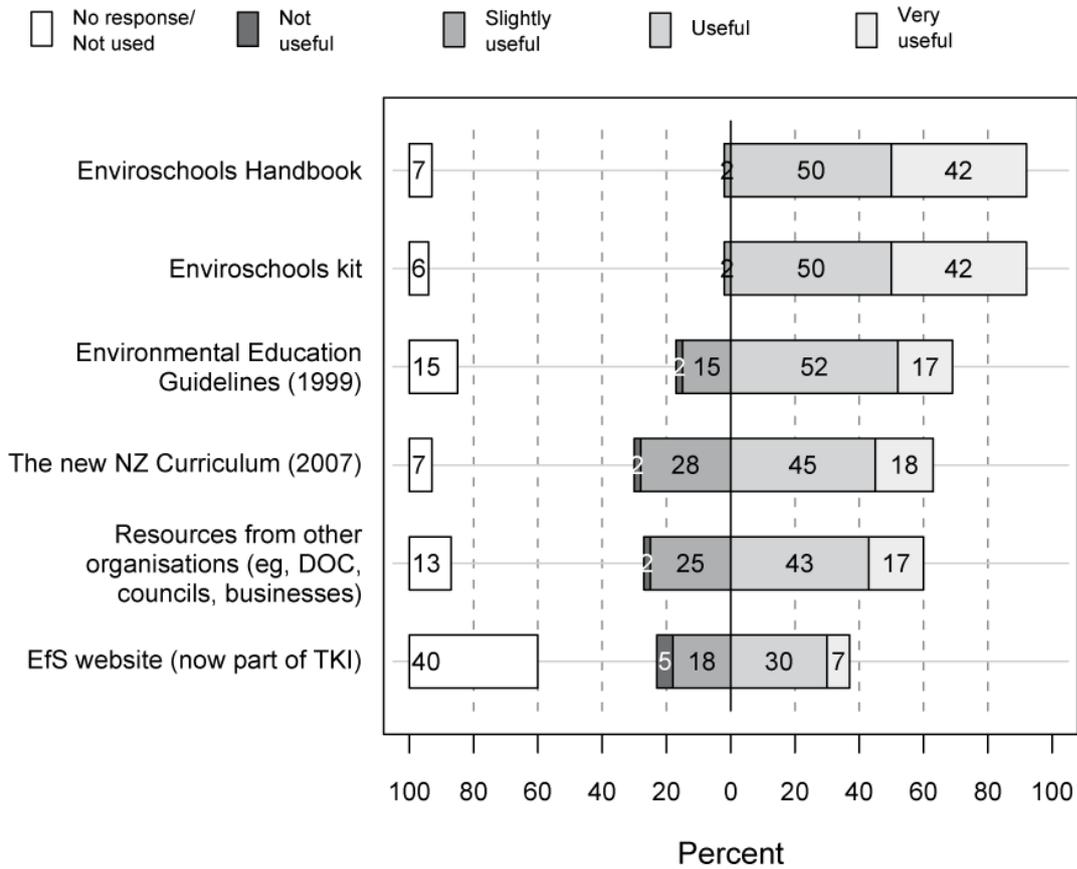
Table 13: Facilitators who reported using these resources in their work with schools

	Regularly % (n=31)	Occasionally % (n=31)	Never % (n=31)	Don't know % (n=31)
Guidelines for Environmental Education in NZ Schools	26	68	6	0
Ministry of Education key messages on EfS	6	26	45	23
TKI-EfS website	3	68	26	3
Other websites	55	45	0	0
Resources from other sources eg, CDs, books etc	74	26	0	0
Self-developed resources	58	35	7	0
People in the environmental/sustainability community	74	26	0	0

School use of resources

An evaluation of the use of EnviroSchools and other resources by the enviroschools showed similar outcomes. Figure 3 below shows the responses from the lead teacher survey. The table indicates that the EnviroSchools Kit and Handbook are the most valued EfS resources for teachers in enviroschools.

Figure 3: Use of resources reported by enviroschools lead teachers



The case studies also revealed good support for the resources that the Enviroschools Programme provides. Many school staff spoke well of the kit as this quote from one principal illustrates:

I think the [kit] is very directional and very helpful and I have liked the way that when we have raced ahead on bits, we have been pulled back to the plan and we have been pulled back to the student voice aspect and the ownership across aspect and the building the community links aspects [that the kit emphasises].

Another lead teacher valued several resource options:

Well it's the Enviroschools Kit, which is really good. The Enviroschools Scrapbook which is ideas from all other schools that they've put together, and we get a lot of ideas from there, from other schools. Their tours, they usually have a magic school bus tour or visits to other schools and we always take a group of children along there and they take photos and they come back and feedback. Had a lot of ideas and initiatives from that kind of thing.

A further comment in support of the scrapbook was:

Well I am very impressed with the regional and the national scrapbook that we get. There is one page where people digest what was important to them for a year into a page and you can see at a glance, you can see that is a good idea or we are on the right lines.

However, the one resource that enviroschools respondents emphasised the most was the facilitator, with many expressing the view that this person was the key to the whole programme. The role that this person in providing resources, practical help, motivation and links to other resources was seen to be invaluable. As one case study principal said, "I'm very pleased that we, at the moment, are able to access external resources and the facilitator and so forth and they keep providing us with a good prod and some models with practice and so forth".

5.3 Programme development

This section examines the following objectives:

- access for all students to the programme throughout their schooling
- development of the programme in kura and resources in te reo
- integration of EfS into school buildings and operations
- evaluation data collected that reflects progress.

Student access

The first point regarding development of access for all students to the programme throughout their schooling is difficult to report on here. The programme is now available to all schools, but access to the facilitated programme is still limited by availability of funding at a regional level. Any school could enrol in the Awards Scheme, and become part of the programme without getting access to Enviroschools facilitation, but potentially gain advice through the School Support Services EfS advisors. There has been a significant increase in uptake of the programme in the early childhood sector, which contributes to providing students with access to EfS from their earliest years of education. Analysis of Enviroschools documents shows awareness by the Enviroschools Foundation that school participation in the programme is skewed slightly towards upper decile schools, and a commitment to looking at ways to redress this imbalance. The facilitators rated progress towards the Enviroschools objective of 'enabling access and providing continuous pathways in EfS' as:

- achieved well (9/29 respondents)
- progress was being made (16/29)
- progress was slow (4/29).

Programme development in kura

The development of the programme in kura appears to be slower than would be desired by the staff of the programme. At the end of 2007, there were 27 kura involved in the programme. The programme development in kura may be hampered by a lack of suitably qualified facilitators. The recent provision of kura Māori workshops for kura teachers and facilitators, and development of the te reo kete and the evolution of the Mātauranga Taiao initiative addresses this issue. The Enviroschools facilitators rated progress towards the Enviroschools objective of 'enabling students in kura Māori to be involved in Enviroschools in te reo Māori and from a Māori perspective' as:

- achieved well (3/16 respondents)
- progress was being made (10/16)
- progress was slow (3/16).

The low response rate to this question may be an indicator of lack of knowledge of what is happening for this objective.

School buildings and operations

At this stage there are a number of projects on ecological building and measuring change underway that seek to help schools understand how to move forward in these areas. These projects include three schools that are working to design and build sustainable buildings with students fully integrated in the process. Other schools, which have submitted plans to the Ministry for building and renovation incorporating sustainable features, have been told that such features are not budgeted for. The facilitators rated progress towards the Enviroschools objective of 'having sustainable school buildings and operations that reflect EfS principles and involve students in the process' as:

- achieved well (3/26 respondents)
- that progress was being made (12/26)
- that progress was slow (10/26)
- that no progress was being made (1/26).

This data indicates a facilitator belief that, of the Enviroschools objectives, this one is being the least achieved, and may reflect the difficulty of overcoming policy and budget constraints outside the control of the Enviroschools Programme. A project involving a masters student will soon begin to look at life cycle analysis for buildings as way forward in this thinking.

Since the facilitator data was collected in 2007, a new project in which schools are invited to design an eco-hut has been inaugurated. This project encourages students to learn about eco-design within a manageable project and will culminate with a judging and celebration event in 2010.

The measuring change project has progressed over the past year to the point where a web-based system is about to be launched. This will initially permit schools to access documents to facilitate reflection on their environmental actions and to monitor the outcomes of these actions over time. In the near future the website will allow students to upload this data onto a database that will allow a running record of their actions and the outcomes to be kept and comparisons to be made across schools, regions and the country. This project will demonstrate links to *The New Zealand Curriculum*.

Data collection

The main part of this section considers the reporting and data collection within the Enviroschools Programme. As the programme involves staff at a number of levels, there is potential for information flow between each of these levels, and these flows are discussed in turn. The first point of information flow is between the Ministry of Education and the Enviroschools Foundation. This flow takes the form of milestone reports from Enviroschools to the Ministry. Analysis of the service agreements suggest that progress is being made in national coordination through strengthened partnerships, for example with DoC and Holcim, regional support through training and resources such as trialling of Ko Au Ko Koe, Ko Koe Ko Au, and programme development, particularly through the new Youth Jam, and ecological building and research projects.

The information flow between the national office and the delivery of the programme revolves mainly around communication with the regional coordinators at present. This involves data collection by the national office around numbers of schools involved and awards given, who the facilitators are, what training they need and what regional events are being run. There were two regional coordination meetings held in 2007 and 2008 with all regional coordinators to progress development of the programme and provide peer support for the coordinators. The national office note that at present they collect little information directly from schools, but the measuring change project described above will contribute to data collection on schools taking environmental actions.

Regional coordinators report to their funding agencies in a number of ways. This includes oral reporting of programme delivery within schools, often including the facilitators in the reporting process. Within the council funding environment a tendency was expressed for the focus to be on quantity ie, how many schools involved, how many workshops run etc, and environmental improvement, reporting such items as waste audits, energy and water use.

Processes for information flow from the facilitators to their regional coordinators are still developing but in many regions the use of summary sheets for each school is becoming common. This system was developed in the Auckland region and is now spreading throughout the country. Of the facilitators who responded to the survey, 22/31 noted using summary sheets in their reporting to their regional coordinator.

The survey of facilitators asked them in an open question what data they were currently collecting to know if they were making a difference in their work. The main data sources reported were:

- audits of sustainable school practices (9/31 facilitators)
- Award information (6/31)
- photographs of school change (5/31)
- teacher reports (4/31)
- student work (3/31).

Finally the facilitators were asked what data collection they found useful to them in informing their work. The responses were:

- Data collected personally by the facilitators—17/24 who responded to this question found this data useful or very useful in informing their work.
- Data collected by schools—16/18 respondents found this data useful or very useful in informing their work.
- Reports that facilitators provided to their regional coordinator—16/24 found this useful in informing their work.

The facilitators rated progress towards the Enviroschools objective of ‘having evaluation data available by Enviroschools participants at all levels reflecting on and monitoring their progress’ as:

- achieved well (2/23 respondents)
- that progress was being made (12/23)
- that progress was slow (7/23)
- that no progress was being made (2/23).

This finding indicates that evaluation data collection within the Enviroschools Programme is an area that needs consideration for improvement.

5.4 Summary

In summary, this section has reviewed the achievement of the Service Agreement objectives of the Enviroschools Programme from the perspectives of the Enviroschools staff and a sample of enviroschools. The following key points emerged:

- The objectives of national coordination being achieved well were strategic direction and growth, relationship maintenance and growth, and support of regional coordinators. Raising the profile of environmental education for sustainability was not evaluated.

- The objectives of regional support were being achieved well with some potential for further development.
- Facilitator PD is developing and new and more advanced training opportunities, particularly in Māori perspectives, were seen to be important for progress. The annual hui, Youth Jam and regional workshops were seen by most respondents as useful PD. Facilitators called for more PD in facilitation/mentoring.
- Enviroschools resources such as the Kit, Handbook and Scrapbooks were all valued as useful in their work by both facilitators and teachers. A most important resource was people, either facilitators or community experts.
- The objectives of programme development were all seen to be in the development phase with mixed progress being achieved.
- Progress towards ensuring student access to EfS pathways and development in kura was reported as happening.
- Progress towards developing sustainable school operations and buildings was regarded as slow but was seen to be constrained by what schools were allowed to do. New projects on ecological building and Measuring Change are developing.
- Progress in data collection and reporting systems are still developing in the Enviroschools Programme. The development of robust methods for collecting data on outcomes, both environmental and educational, that enhance innovation and commitment to learning whilst recognising the exact purpose of the data collection, would seem to be a priority. New initiatives at both national and regional level were reported that are working towards improving this situation. Improvements could be looked for in training facilitators in collecting data through appropriate research methods, ensuring a balance between collection of data on environmental improvement, and on educational outcomes. It is recognised that the latter is not easily achievable at present as the EfS community itself endeavours to understand more about educational achievement in EfS, but it would be important for Enviroschools facilitators to remain knowledgeable about the latest research in this area.

6. Impact of the Enviroschools Programme on organisational change, teaching and learning

In this section we examine the impact of the work of the Enviroschools Programme on three levels. Firstly, we examine changes that were reported at the organisational level. This looks at sustainable practices in the school and its community, and any support or constraints to progress that were reported. Secondly, as a key focus of the Enviroschools Programme is the provision of professional development, its impacts on teacher practice are examined. Thirdly, bearing in mind the tension between the mechanistic approach (of programme logic of teacher impact flowing into student achievement), and the more ecological approach of emergent change in complex systems, we examine student outcomes. This three level model is allied to the work of a leading international professional development evaluator, Thomas Guskey (2000, 2002). His work suggests that professional development can be examined as follows:

- Organisational change (eg, What changes were reported at the school and community level? Were teachers' supported to make change? What barriers exist to further change?).
- PD impacts on teachers' practices—their reactions (eg, Did they like it? Did it make sense? Did they find it useful?), their learning (eg, What did they learn?), and their practice (eg, Did it make a difference to their practice?).
- Student learning opportunities and outcomes (eg, Did it benefit students? How?).

We begin then by looking at Enviroschools' impact on organisational change.

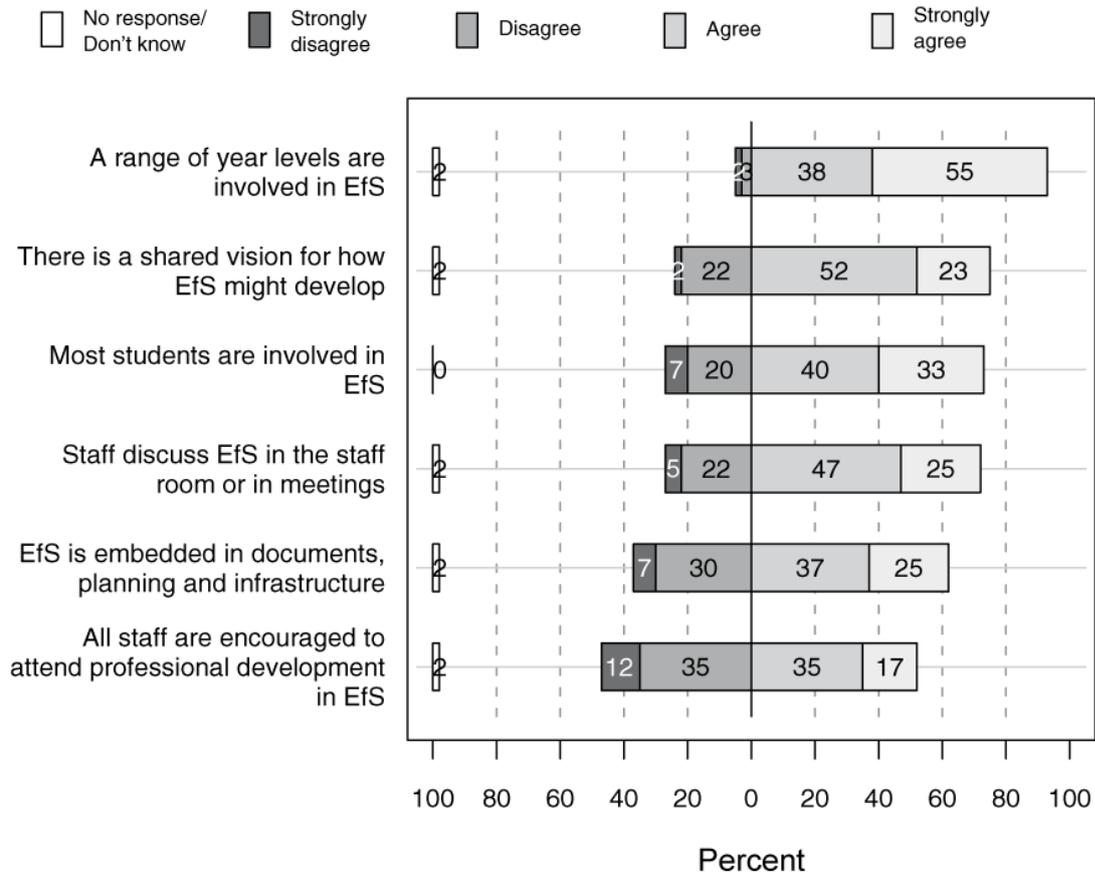
6.1 Organisational change

This section looks at engagement in EfS, changes in practices, supports and constraints.

Engagement in EfS

The Enviroschools lead teacher survey examined how their schools were currently involved with EfS. Figure 4 summarises the findings.

Figure 4: School involvement with EfS



The case study teachers and students generally agreed with this data but also expressed both acceptance and frustration about lack of engagement by some students. As one teacher in a composite school noted about the difficulty of engaging teenagers:

Well you are never going to get a more passionate group of people thinking about the environment than, you know, like your Year three/four/fives and sixes, it kind of like switches them on and they just love it. And I think that if you could capture that and sustain it then you are fine. What you have got to avoid is the thing that then happens in puberty where it stops becoming all about the planet, and it is becoming all about me.

The principal at the same school felt that as juniors moved through towards the senior school they were showing signs of taking their environmental learning with them, as he said, “I think the [Year] 7 and 8’s are better engaged than they were 2 or 3 years ago, for instance. So I think it does make a difference”. But he too expressed frustration at what happened with the teenagers in the senior school, many of whom he felt seemed to lack engagement in environmental learning and action.

Some case study Year 6 students also expressed their frustration at their peers who were not engaged. At their school there is a good rubbish recycling system, but some children still don’t use it. “Some students don’t really think, they just put it wherever they like” (case study student). When asked whose job it was to tidy up the rubbish, one student said, “probably themselves, the people should take responsibility for themselves”. However, they felt this was unlikely to happen. One student in the group further added, “I don’t think a lot of them know this is an enviroschool, and they

probably just take it for granted that we just clean it up for them. I think that should be the next step, that, although everyone is involved, for them to like being involved, to enjoy themselves". This echoes the Enviroschools principle of genuine student participation.

The Enviroschools Programme promotes the importance of student voice in decision-making (Enviroschools, 2005). The teachers and students were asked about the opportunities that students had in their schools to contribute to decision-making. Teachers were generally agreed that students were able to participate and contribute ideas. The principal at one primary school described how the board of trustees had made a decision to cut down some large trees in the school, and the senior students became concerned and off their own bat surveyed their peers and sought assurances from the board that their decision was the right one, and that replacement trees would be planted. This happened. One case study teacher issues a warning, however, about asking for student input:

I think in the past they've been consulted, and asked to do things and then it's all turned to custard because of OSH or finances or something and so now we need to be careful to make sure that if we ask children to do something or plan something that we can carry it out. Yeah, we've learned from our mistakes or the mistakes that were made before us. We want these kids to feel valued if they're putting the efforts into it, they need to be able to see results.

Students felt that they could have a say but were unsure of whether their ideas would be listened to. One focus group of students quoted the example of the tree-felling and knew that trees had been planted to replace those cut down, giving them faith their voice could count.

Change to sustainable practices

As Figure 4 above shows, most enviroschools lead teacher respondents (75 percent, n=60) felt there was a shared vision in their school for how EfS might develop. This was exemplified in a qualified way about staff in one case study school, when one teacher at the school said:

I'd say like they're all supportive of it, and want to be an enviroschool and they think it's great. But some of them, like things like the paper recycling, they don't get on board 100 percent with doing it. Because probably at home they don't do that 100 percent either. But I also think if you're real forceful about that and get angry or if you said to the staff, you have to do this, or you have to do this, then they'll turn off, so it has to be quite a gentle approach.

Staff and students in the case study schools were asked about their vision for their school. Students focussed on taking a holistic approach to sustainability in their schools, considering issues like how new school buildings are designed, how they use energy, etc. Senior primary students interviewed in one case study school offered these comments:

Probably make this school more eco-friendly, because we still have things that make the environment polluted. There's lots of carbon emissions coming from our coal heater, there's lots of rubbish around the school, so we could plant trees and make more oxygen.

If you want to add a little more to the school, to make it more environment-friendly, the teachers should approve. You could also base your studies around it, like writing, maths, like how many leaves fall off the trees.

It would be a really great achievement if people could think more wisely about the environment, like not using chemicals, and not chucking rubbish.

These visions show evidence of critical thinking about the issues of sustainability in their schools. Staff also shared their visions, which focussed on inculcating an environmental philosophy throughout the school that would show in all things that were done. This included a caretaker’s call for double glazing and solar power, a teacher’s hope for sustainability teaching to be woven throughout the curriculum, and a board of trustee member’s desire to plant a food forest in the school grounds to sustain the school and its community. Figure 5 below shows how enviroschools teacher survey respondents felt that EnviroSchools professional development and support was impacting on their school nature and structures.

Figure 5: EnviroSchools teacher perceptions of the impacts of the work of EnviroSchools facilitators on the nature and structures in their schools

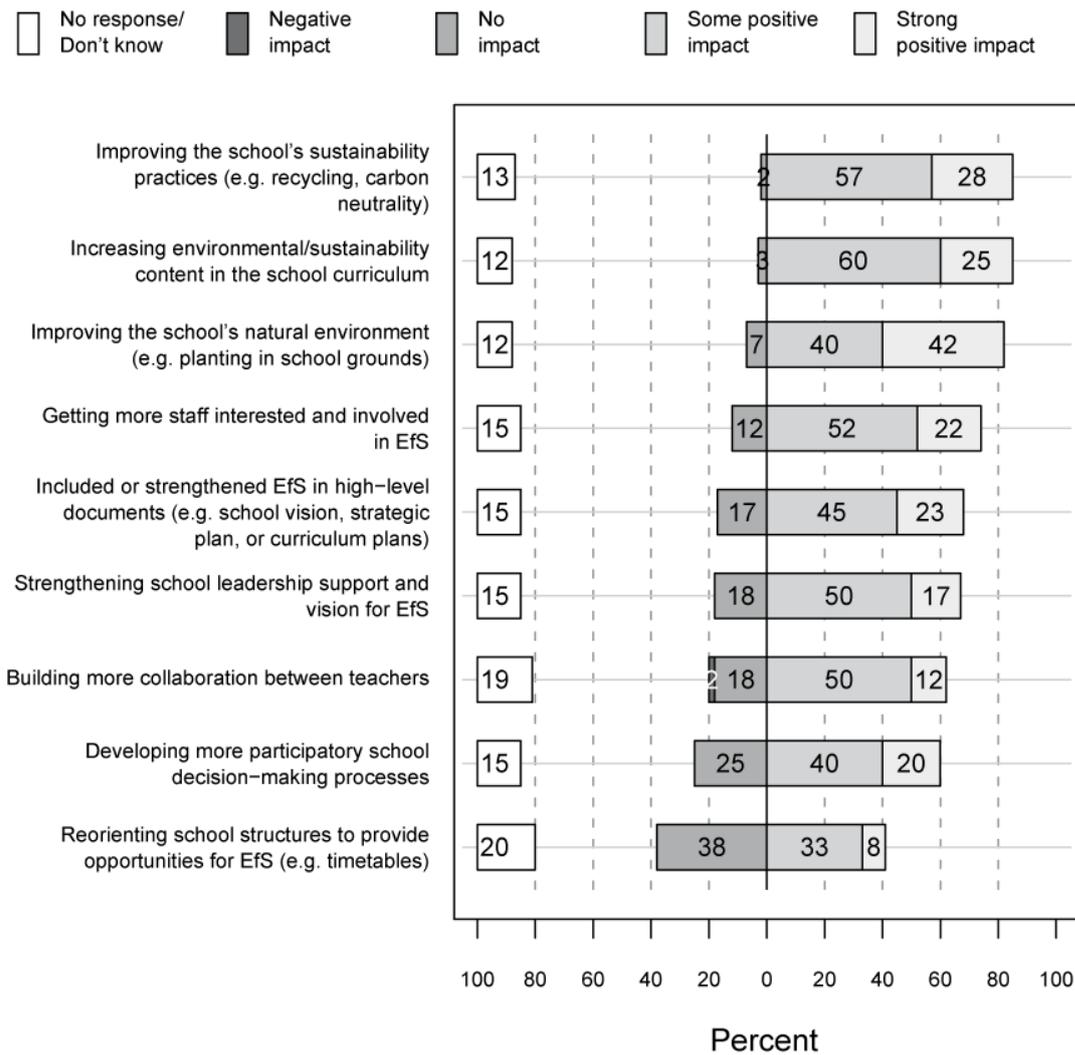


Figure 5 shows that the enviroschools teacher respondents felt that EnviroSchools facilitators were having the most impact on three of the key areas of school life recognised for change in the EnviroSchools Programme, namely operational practices, living curriculum and physical surroundings. There was seen to be less impact on the key area of organisational management.

When the enviroschools teachers were asked in an open question to describe the main change(s) that had happened at their school as a result of EnviroSchools PD, a range of responses were provided, which are summarised in Table 14 below.

Table 14: Main changes enviroschools teachers reported making in their schools as a result of Enviroschools PD

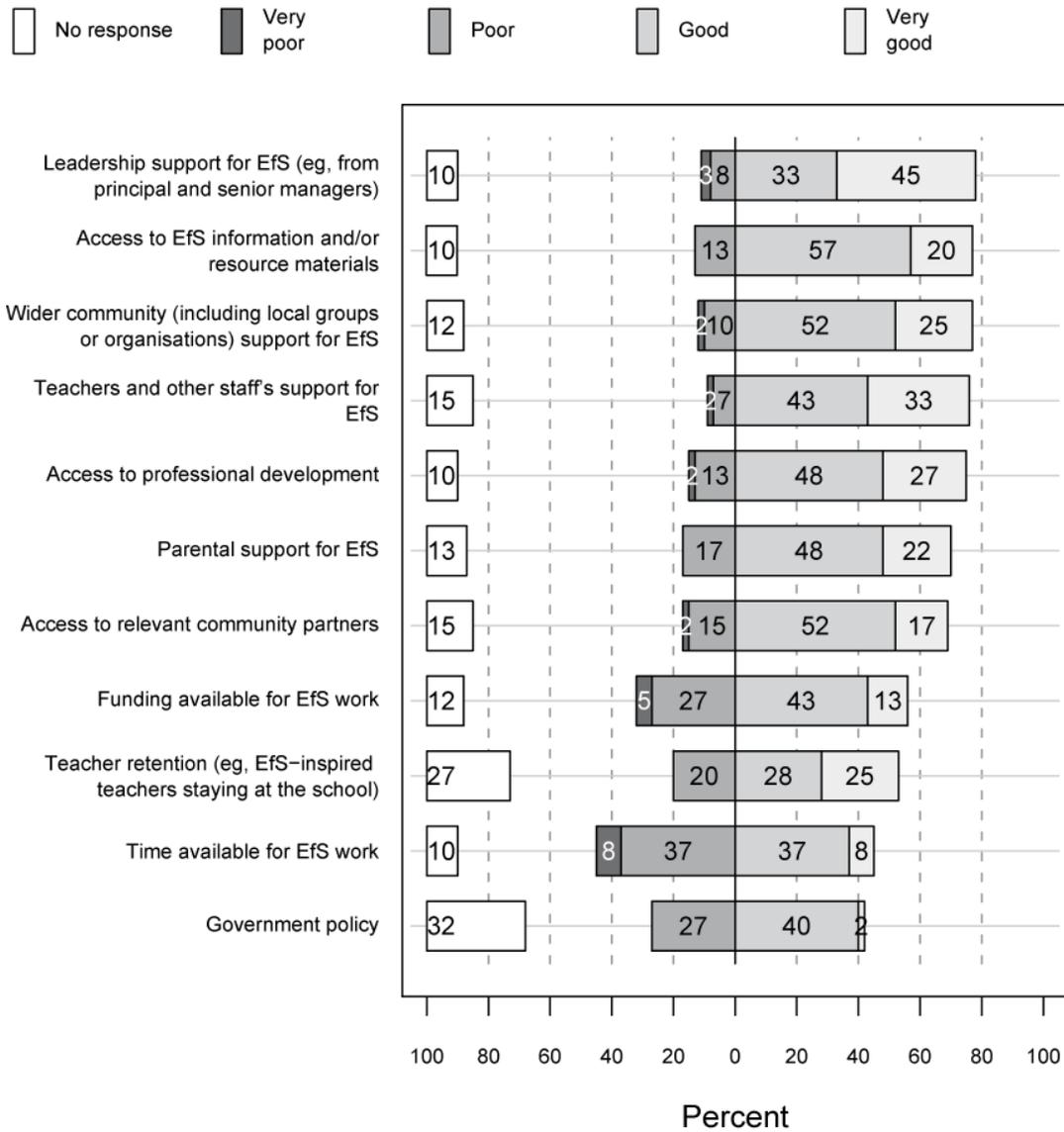
Response theme	No. of responses	Examples of comments
More sustainable practices at school	22	Setting up a school-wide recycling system for paper, cardboard and co-mingles (glass, cans and plastics). Developing a composting system for our fruit scraps/Developing a worm farm/Recycling (Kerbside collections) weekly/Re-use of paper, card/"Bin It Right"—reducing waste in our school.
Growing awareness of environmental/sustainability issues	7	The children are taking an avid interest in their surroundings. They are designing areas and maintaining areas.
More community involved in the school	6	We have stronger community involvement that begins at the planning stage. We also aim to take this further by sharing our findings and actions with wider community.
More students involved in their learning	3	

These findings indicate that the main impact that enviroschools teachers perceive from the Enviroschools PD is on sustainable practices. These practices are perhaps some of the most visible, tangible and possibly easily-achieved changes that can occur, which may contribute to this reporting level.

Supports and constraints

This section examines those aspects of educational and schooling practice that are acting to support or constrain development of EfS through the Enviroschools Programme. This data was gathered through the enviroschools lead teacher survey and the case study interviews. Figure 6 shows how the enviroschools lead teachers rated support for EfS development in their school.

Figure 6: Rating of support for EfS development in their schools by Enviroschool lead teachers



This data is now further discussed with respect to support from people within the school, and from the wider community.

Support from within the school

The data above shows that the lead teachers rated support from leadership and their fellow teachers as generally strong. Interviews in the case studies also indicated that strong leadership was a key factor in development in EfS in schools. In both cases, the enviroschools were thought to have strong leadership support. In one case, the school management were directly involved, as one teacher explained, “whenever we have an Enviroschools meeting, half of it is made up of management, the other half are classroom teachers. So that says a lot to me”. In the second school, the board of trustees were very active in their role of support, as this teacher explains:

Oh, they are really on to it, in fact they give up their time in term breaks and come into the school and do work to improve the environment. Like we just came up with these neat little recycling centres, and some of the board members came in and built them and then our syndicate painted them and now they are out in the school and I think they are working well.

However, without leadership support, this teacher expressed the opinion that their Enviroschools Programme would suffer when she noted that “it is about the leadership, the management of the school, if they saw it as important it would continue. But I believe as soon as the management don't have that philosophy, then it will disappear”. The survey of enviroschools teachers revealed that 87 percent (47/54) of respondents felt that leadership support for EfS development in their school was good or very good. However, the other 13 percent rated leadership support as poor or very poor with some additional comments given such as “lack of commitment from management team. They allow it to happen. But do not embrace a whole school commitment” and lack of interest and concern from the school board and management. The principals in the two case studies made the point that schools had many other competing interests and requirements and that despite a willingness to engage, that time and money did not always allow them to commit as much resource to EfS as some teachers would like.

Community interactions

The data in Figure 6 above shows that the enviroschools lead teachers rated support from parents and the wider community as strong in many schools, as well as receiving good access to relevant community partners. Seeing a school as part of its community is a principle of the Enviroschools Programme (Enviroschools Programme, 2005) and whilst community interactions were in place in the two case study schools, they were of quite different flavours. In the composite school, a long history of engagement with their community was evident. This school, based in a small environmentally-oriented town, had multiple links with the community at many levels of the school. These links were embodied in school groups visiting the local recycling centre, taking part in plantings and clean-ups, having guest speakers come into the school, and board of trustees members doing regular work in the school. As the principal said, “I do think that the notion that in the end this is about the school being the community and the community being the school is really the most vital component of the Enviroschools Programme”. The enviroschools lead teacher also expressed their belief that “I think [the programme] just is a very useful vehicle to develop some relationships within the community that were perhaps a bit shaky, so it is a great vehicle for that in a community like this, with the values that this community has got”.

In the second case study school community interactions were also seen as important and were multifaceted, including students engaging in community planting and local experts coming in to talk to students. Parental help was only sought for environmental actions where the primary student capability was lacking eg, in digging post holes etc.

When asked in the survey what would further help their school to develop EFS, one enviroschools lead teacher said:

Help to develop a connection with local iwi and groups that are special to our own area. To provide opportunities for students to move from the step—we belong to our school and care for it—to this is our community, let's be a part of it and care for it too.

Key constraints

Figure 6 above highlighted issues around funding and time to implement EfS. These issues are not new, having also been reported by Cowie et al. (2004) in their evaluation of environmental education in New Zealand schools. When the enviroschools lead teachers were asked specifically about any barriers that may have prevented their schools from further developing EfS, time and funding once again came to the fore, as Table 15 shows.

Table 15: Enviroschools lead teachers' descriptions of barriers that were preventing development of EfS in their schools

Code	No. of responses (n=46)	Examples of comments
Time to implement EfS	30	Time. Multiple demands of curriculum requirements and pressure of assessments.
Funding for projects	11	Finance to carry out all the projects kids want to do and resources to better prepare them with "life time skills" of growing, cultivating, reaping and preserving.
Leadership support	6	Very poor leadership from principal—no interest from staff—but children very excited to be part of team.
Community and parental support	3	Community support (parents—many not Kiwis and have completely differing views. Education evening—5 turned up, 2 didn't speak English and didn't know what they were coming to.

Time for teaching and learning in schools always seems to be a precious commodity and time for EfS seems no different. The pressures of meeting curriculum and assessment requirements appears to be a key barrier to EfS, although the curriculum now provides a stronger emphasis on EfS, and if more teachers were able to gain professional development in how to integrate EfS into their curriculum offerings, this may go some way to alleviating this barrier. Time also was seen to be of value in sharing ideas between schools, as this enviroschools lead teacher commented in the survey:

For 6 years we've been an enviroschool going through the awards scheme. Talking to other teachers and sharing ideas is necessary, our local cluster meetings have been the most successful and beneficial times for me, as people can chat about their own school/organisation. I would appreciate having the time and money to visit other schools/organisations in school time as we have many visitors coming to see our lovely school.

The case studies revealed further data on barriers to EfS in schools. Time and money were prominent as these two comments revealed:

I think it's the long periods it takes to actually get funding applications sorted. I mean there is so much red tape paperwork to go through and I think that is probably the hugest barrier to anyone (case study caretaker).

Oh, it is probably just time—we need more time. I mean we are easily able to prove ourselves a Silver Award school, we just haven't got time to do the paperwork. And so, you know, and something like that is quite sustaining in terms of keeping your progress going and I think that our [Enviroschools facilitator] is fearful that without some progress, that the initiative might fall over and, again, become something that depends entirely on teacher interest.

However, finding time to teach EfS, as one case study teacher explained, could be solved by integrating EfS into other curriculum areas:

I think lots of teachers who don't have a lot of knowledge about Enviroschools might see it as another curriculum area, and so you have all your other curriculum areas that you are trying to teach which are your priorities. But to me it isn't separate, you link it into appropriate topics, appropriate parts of teaching. To me that's how it works, that's the only way it can work because I don't have time to teach maths, reading, writing, technology, science, and then Enviroschools as well. So that's how it works for me, to include Enviroschools concepts into my daily programme. We planted vegetables in our class garden and

then we did cooking, because we are doing healthy foods, so we picked silverbeet out of our class garden and we made silverbeet quiche. The students took the recipes home and they were making them at home as well.

6.2 Enviroschools impact on teachers' practices

In this section we examine the impact of the Enviroschools professional development programme on teachers' practices. We examine teachers' reactions to the programme and its PD, what they reported learning, and what changes they had made to their practices.

Teachers' reactions

In order to understand their reactions to the professional development received through the Enviroschools Programme, we asked survey and interview respondents to comment on their personal experiences. On a scale from one (very useful) to four (not useful), the mean score for each of the professional development categories below was about 1.7, suggesting that on average people find Enviroschools professional development to sit between useful and very useful. Table 16 below shows the percent who found each category *very* useful or useful. Overall the message is very positive.

Table 16: Teacher respondents who found professional development 'very useful' or 'useful' (out of those whom experienced it)

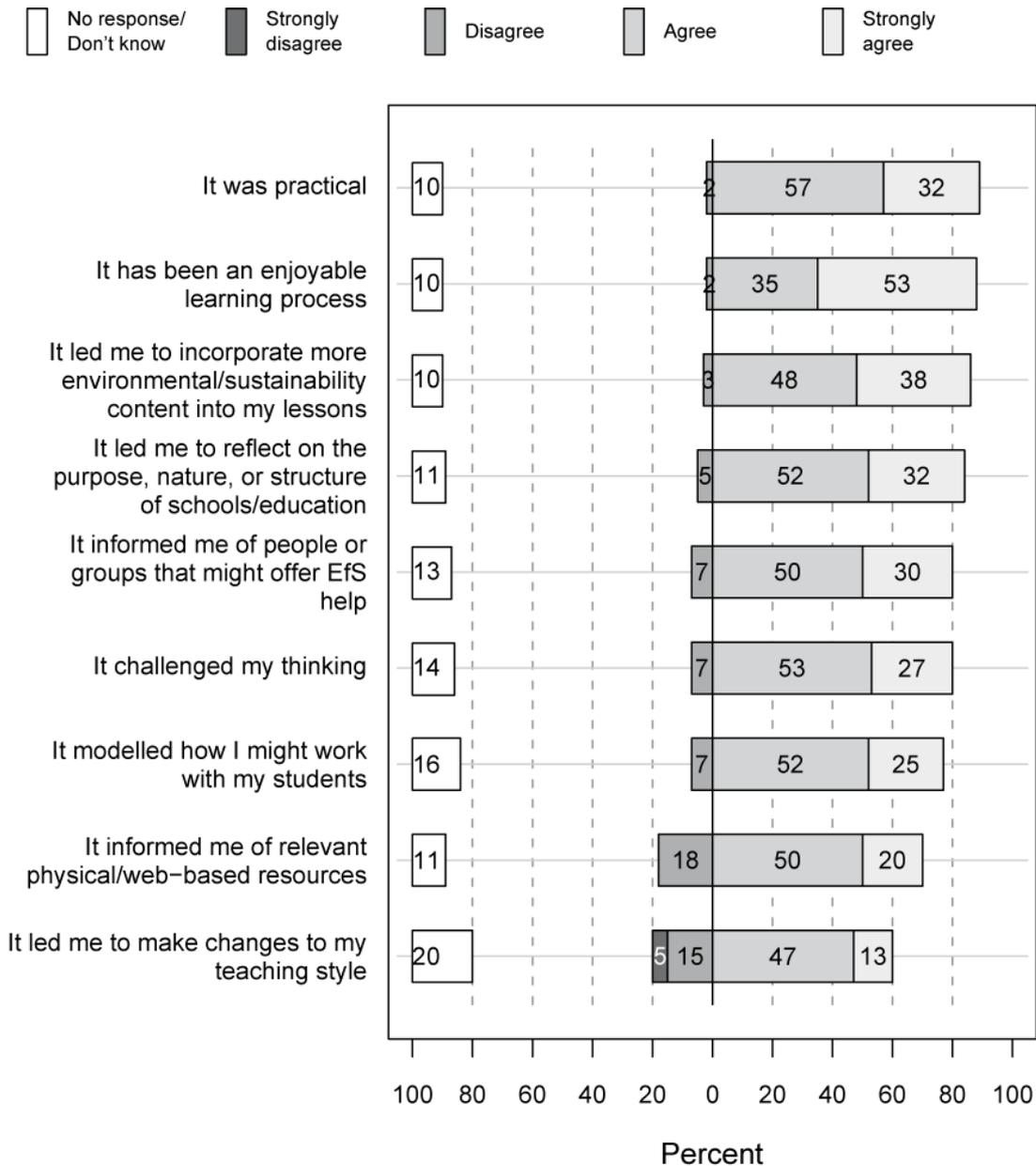
Professional development opportunity	Very useful %	Useful %
Individual one-on-one professional development/support for survey respondent (n=47)	66	32
Other Enviroschools professional development (n=22)	59	36
Professional development for a region/cluster, attended by staff from a range of schools (n=42)	52	40
Professional development for a school, attended by several staff within the school (n=40)	47.5	45
Attendance at Hui or Youth Jam (n=28)	36	54

Several of the reasons why enviroschools staff members found Enviroschools professional development useful are illustrated in Figure 7 below. By far the majority found it to be enjoyable, practical, challenging, and informative. This was exemplified in the composite case study school, where a teacher and a group of students attended a Youth Jam and found it a very positive experience. The teacher said:

Youth Jam I reckon is a really good thing to get senior students involved in Enviroschools and environmental things, because the kids that went with me this year, they're all boys and they're really all into it and they love it, they all want to come next year and the role models there are really good.

A case study envirogroup student also offered a perspective on a Youth Jam that he had recently attended, saying that, "second time going there, it's actually improved. There's a lot more people going there, and a lot more students getting up to talk. There was a lot more people contributing, rather than just sitting there and watching."

Figure 7: Enviroschools teacher perceptions of their professional development through the Enviroschools Programme



As can be seen from the table, the teachers generally agreed that the Enviroschools had helped them in a number of ways. Interestingly the least support was given to prompting changes in teaching style and including more environmental/sustainability content (although these areas still had at least 60 percent agreement). Those who disagreed stated that hadn't changed their teaching style as they felt they were already doing well, and one respondent noted that such changes couldn't easily be ascribed to Enviroschools PD, as they said, "I don't think I incorporate any more environmental content (or less) than 2 years ago, and changes to my teaching style come about through a wide variety of impacts—revised curriculum, ICT contract".

When asked what improvement could be made to their experiences of the Enviroschools PD service:

- Six teachers asked for more facilitator time eg, "Enviroschools coordinator seems stretched—lack of contact this year has led to us missing the cut-off date for submitting our work for an award".

- Two teachers asked for more modelling of what could be done eg, “Sample units of work that could be delivered within existing school structure”.
- Two teachers asked more web-based links eg, “Forum on knowledge nets for everyone to offer ideas/sites, etc, and for "people—company" resources.

Finally, two teachers made a call for the need for a sustained period of professional development and support to embed EfS into the culture of their schools:

The initial 2 year PD the school received as whole school PD was fine, but unlike many ‘paper’ based curriculum areas, it takes a long time to establish a 'culture' of sustainability in a school and ongoing support is very much needed.

I believe the support is readily available for those schools who seek it—ie, the enthusiasts! My concern is will funding be adequate to support schools who now see a need to move in this direction, now that the revised [New Zealand Curriculum] gives EfS a strong focus—almost a requirement if you look closely at the principles. To make changes—shifts in thinking—PD in this area in school needs to be sustained and well supported by facilitators in at least a 2 year school-wide programme.

These comments reflect the notion of systems thinking in developing and sustaining a school wide EfS programme.

Teachers' learning

We were interested in the extent to which involvement in the Enviroschools Programme professional development helps teachers and school leaders to better understand various aspects and manifestations of EfS. This is based partly on an assumption that, in order to change teacher and school practices, professional development must change the way people think: to add to, challenge, or even transform, participants’ existing knowledge, beliefs, values, confidence, etc, so that they can reach a new way of being/doing in their work and the world. The Enviroschools Programme seeks change through its emphasis on sustainable communities, education for sustainability and student participation.

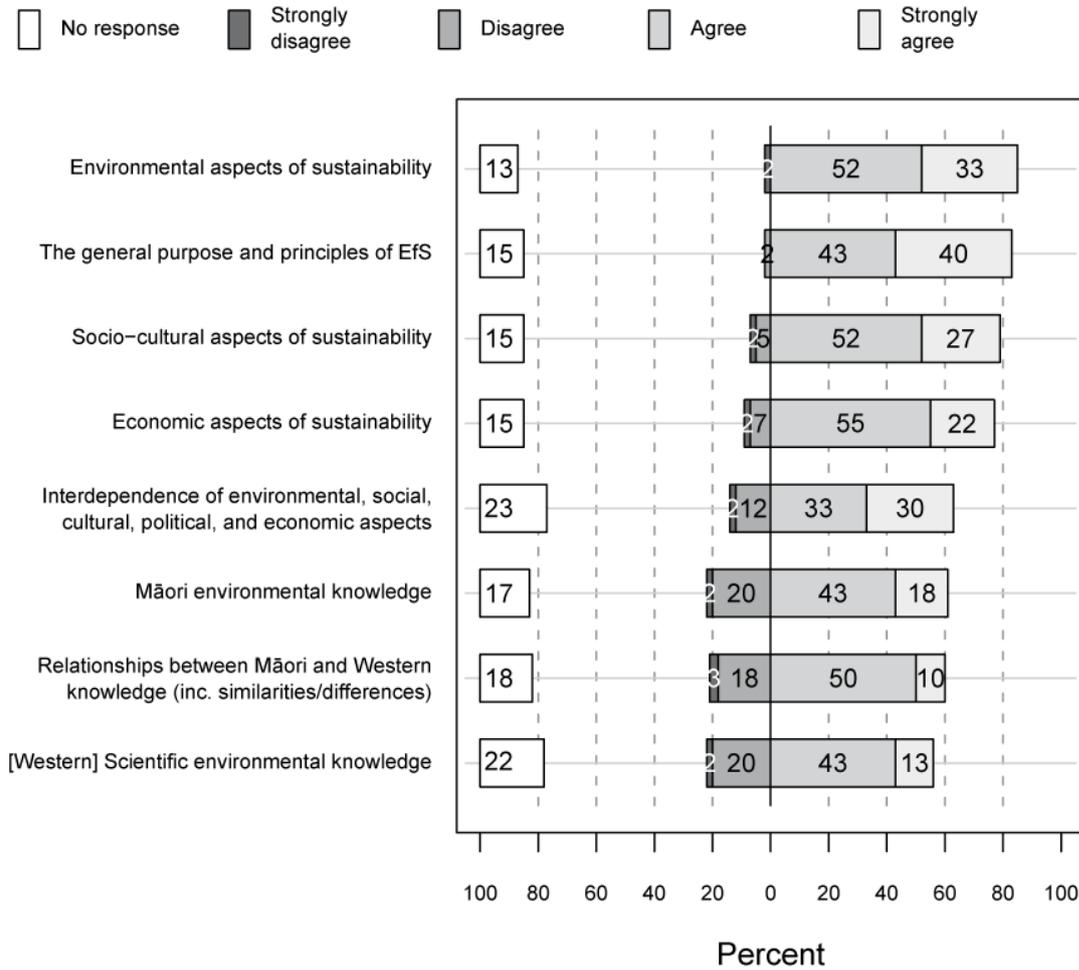
As shown in Figure 7 above, 80 percent of teacher respondents reported that Enviroschools professional development they had attended had challenged their thinking. The teachers were then asked how being involved in PD with the Enviroschools Programme and its facilitators had helped them to better understand key aspects of EfS. Firstly, they were asked about how it had helped them better understand what government policy documents were saying about EfS. Findings from these questions are shown in Table 17, which indicates percentage of respondents who strongly agreed or agreed (on a four point scale from strongly agree to strongly disagree) that Enviroschools PD had helped them better understand certain government documents relating to EfS.

Table 17: Teacher respondents from enviroschools who reported that Enviroschools PD had helped them to better understand these documents

Documents	Strongly agree %	Agree %
NZ's Environmental Education Guidelines (n=50)	18	66
How EfS relates to the front end of The New Zealand Curriculum (ie, vision, principles, key competencies, future focussed themes) (n=44)	25	66

Secondly, the teachers were asked about how it had helped them better understand aspects of sustainability knowledge. Findings from these questions are shown in Figure 8, which indicates percentage of respondents who strongly agreed or agreed (on a four point scale from strongly agree to strongly disagree) that Enviroschools PD had helped them better understand certain aspects of sustainability knowledge.

Figure 8: Percentage of teacher respondents from enviroschools who reported that Enviroschools PD had helped them to better understand these aspects of sustainability knowledge



This data indicates that enviroschools lead teachers feel that Enviroschools PD has helped them better understand environmental and socio-cultural slightly more than economic aspects of sustainability. These findings echo what the facilitators reported of their own understanding in these areas (see Table 8) and point towards further professional development for facilitators in economic and political aspects of sustainability so that they may more ably assist teachers to understand these important aspects of sustainability. There are good levels of agreement in development of understanding about the interdependence of the aspects of sustainability. Further work appears to be needed in developing understanding of western scientific and Māori knowledge of the environment and the relationship between these areas.

Thirdly, the teachers were asked about how it had helped them better understand aspects of sustainability education processes. Findings from these questions are shown in Table 18, which indicates the percentage of respondents who strongly agreed or agreed (on a four point scale from strongly agree to strongly disagree) that Enviroschools PD had helped them better understand certain aspects of sustainability education processes.

Table 18: Teacher respondents from enviroschools who reported that Enviroschools PD had helped them to better understand these aspects of sustainability education processes

EfS educational processes	Strongly agree %	Agree %
How my school can become environmentally sustainable (n=50)	36	60
How I can personally become more environmentally sustainable (n=50)	30	64
How to support student-planned action(s) (n=49)	31	57
Teaching and learning approaches suited to EfS (n=49)	25	67
How to run a specific EfS project or unit (n=51)	23	63
How to support students to make decisions on what and how to learn (n=48)	27	54
How to document students' learning in EfS (n=50)	14	58
How to assess students' EfS learning/achievement (n=47)	11	57
How to monitor progress towards becoming a sustainable school (n=50)	14	70

This table indicates that enviroschools lead teachers feel that Enviroschools PD has helped them to better understand how to make their school and themselves more environmentally sustainable in particular. As one case study teacher noted:

I guess the funny thing is, you research stuff to teach kids, you learn stuff yourself and the funniest thing is the amount of time I brush my teeth now, I used to always leave the tap on and after we did our water unit I found out about wasting water, oh, off, you stop bad habits yourself. But I never learned that as a kid, that you shouldn't leave the tap on when you brush your teeth. But it has definitely changed me.

However, the teachers appeared less confident in their understanding of how to document or assess student learning in EfS, and this again is a similar finding to reports from the facilitators about their own understandings in these areas. As one case study teacher said when discussing outcomes from environmental activities, "I don't suppose I ever really measured it, as such, I am not quite sure how well the measurement, sort of a test, would do all that".

Teachers' practice

This section examines both Enviroschools staff perceptions of the programme's impact on teachers and teachers' own perceptions of that impact.

Enviroschools staff perceptions

In the first phase of this evaluation, Enviroschools staff were asked about their own perceptions of the impact of the programme and their work on schools. Amongst the staff in the Enviroschools Programme, at the national and regional level there is a clear perception that the programme is having an impact. Whilst there is some uncertainty about educational impact, one national staff member noted that they also believed that "over 500 something schools are involved, many of them for a number of years, then that suggests they see value educationally". Certainly the numbers support this belief. Other impacts that were noted were the environmental improvements in waste reduction, energy and water use, leading in many cases to a financial benefit. The programme has also been credited in some schools with reducing problems such as bullying and vandalism, due to the improvement in social cohesiveness in the schools. The programme's emphasis on a whole school approach which involves the students in a greater power-sharing role within the school was highlighted by one regional coordinator. A shift towards a more inclusive style of learning was highlighted as an impact by one national staff member, who said:

One of the biggest changes that I have noticed since I started in this programme, and from a perspective of someone who wasn't a teacher, and hadn't been involved in the formal education system apart from as being a student, when we first started going into schools, I was quite flabbergasted at how little students

were involved in their own learning, to be honest, and how didactic a lot of it still was. And I think over the last five years there has been a huge shift in students leading their own learning and being more involved, the ones we're seeing anyway. I mean I know it is not across the board but there seems to be a lot more awareness and discussion and practice of genuine student participation in projects.

A regional coordinator felt that a satisfactory impact was being made, albeit more slowly than some would like. However, there was a clear realisation that educational change takes time and that real change would happen if the educational process was allowed to run its course. There was also a clear recognition that the Enviroschools Programme alone could not bring about change, and that other factors such as strong messages from the Government, and lobbyists such as Al Gore, were making a difference to schools' willingness to engage.

At a facilitator level, there is a sense that changes happening at school through the Enviroschools Programme are having an impact on the community, through students taking sustainability messages home. The development of strong personal connections within schools and between schools was cited as evidence of the impact of the facilitators' work. Those schools which were seen to take time to embed the programme thoroughly in all aspects of school life were seen to be successful in delivering the programme's intended outcomes. In the survey, facilitators were asked how they felt their work had impacted on various aspects of teachers' work. Their responses are shown in Table 19 below.

Table 19: Facilitators who reported their belief that they were making an impact on various aspects of teachers' work.

	Strong positive impact %	Some positive impact %	No impact %	Negative impact %
Change in teacher knowledge about environment/sustainability (n=30)	23	77	0	0
Change in teacher-student decision-making relationships (n=28)	25	71	4	0
Change in teacher beliefs about environment/sustainability (n=30)	20	77	3	0
Change towards cooperative and inquiry learning (n=28)	18	71	11	0
Change towards critical reflective teaching (n=27)	14	72	14	0
Change in teacher planning processes (n=29)	14	72	14	0

Facilitators were also asked how they felt their work had impacted on wider areas of school life. Their responses are shown in Table 20 below.

Table 20: Facilitators who reported their belief that they were making an impact on various aspects of school life

	Strong positive impact %	Some positive impact %	No impact %	Negative impact %
Change in incorporation of EE/EfS into the curriculum (n=29)	38	62	0	0
Change in school sustainable practices (n=31)	32	64	4	0
Change in school organisational management (n=30)	7	73	20	0
Change in physical environment (n=31)	32	61	7	0
Change in a whole school approach (n=30)	27	67	6	0
Change in student involvement in actions for the environment (n=30)	37	57	6	0
Change in student achievement (n=27)	11	85	4	0

As can be seen from the table, the facilitators believe they are making some positive impact on school life on all aspects examined. Least impact was perceived in changes in organisational management (which would include student involvement in decision-making at school level) and in student achievement. This latter may reflect the aforementioned uncertainty around understanding student achievement in EfS.

Teachers perceptions

Impacts through the use of new knowledge and skills by teachers and schools perceived by the enviroschools were examined through the survey of lead teachers and in interviews in the case studies. These impacts are now discussed.

Figure 9 below shows how enviroschools lead teacher survey respondents felt that EnviroSchools professional development and support was impacting on the teaching and learning practices in their school.

Figure 9: EnviroSchools teacher perceptions of the impacts of the work of EnviroSchools facilitators on the teaching and learning practices in their schools

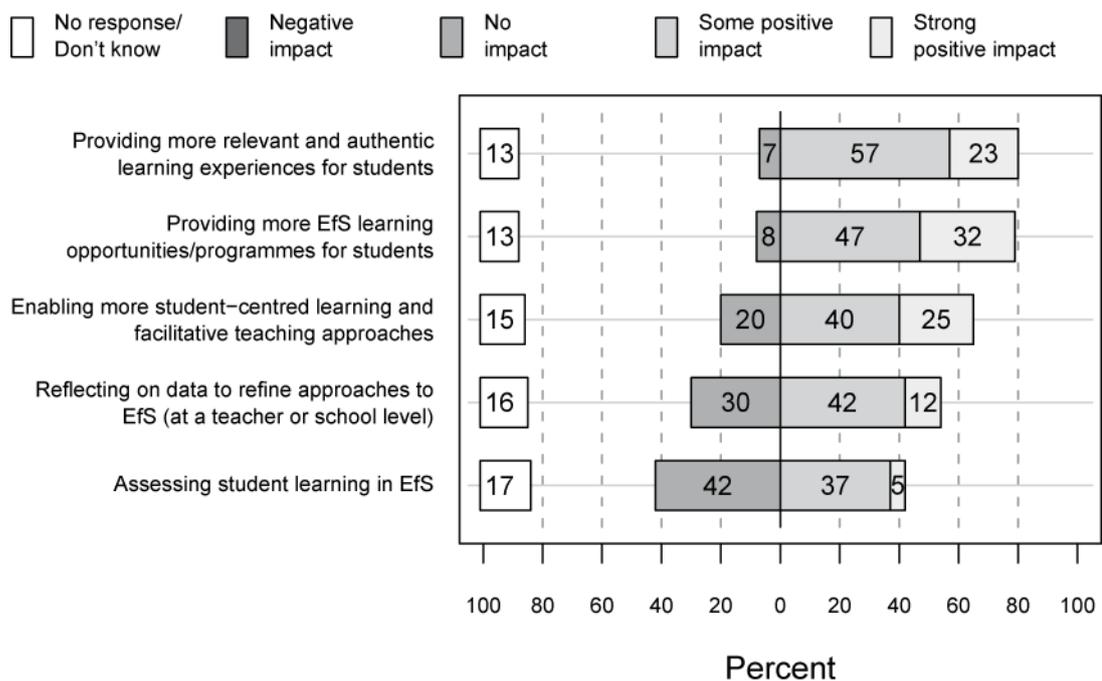


Figure 9 shows that the enviroschools teacher respondents felt that Enviroschools facilitators were having the most impact on providing more relevant and authentic learning experiences for students, and more EfS learning opportunities/programmes for students. When asked about changes to her teaching due to Enviroschools PD, one case study teacher said, “I think there is a different level that I have added into my teaching that I wouldn’t have before”. Much less impact was seen on assessing student learning in EfS and on reflecting on data to refine approaches to EfS, findings which are consistent with what teachers had reported lacking understanding of and which facilitators themselves indicated that they felt they were having less impact on.

When asked in an open question to describe the main change(s) that had happened to their teaching as a result of Enviroschools PD, a range of responses were provided by the teachers, which are summarised in Table 21 below.

Table 21: Main changes enviroschools teachers reported making to their teaching as a result of Enviroschools PD

Response theme	No. of responses (n=57)	Examples of comments
More environmental/sustainability content in teaching	18	Sustainability concepts and issues have become a main focus in more than one curriculum area. Class planning has more of an EE focus.
Students more involved in decision-making and action-taking	10	Students more involved in decision making. Encouraging students to accept challenges in real world/authentic situations, to lead the direction for their learning and to value reflection of 'action' and 'planning' by students and teachers.
More sustainable practices at school	8	I'm an art teacher: I re-use card boxes, use lighter grades of paper, make sure students turn water off when rinsing, turn my lights off in the classroom, have a recycling bin.
Using more practical, hands-on activities	7	
More inquiry learning being used	6	More inquiry based around real issues central to children's experience.
More whole school involvement in projects	4	We are now planning more whole school activities and planning using an integrated inquiry approach.
More integrated/holistic teaching	4	EFS has become 'a way we do things' rather than an isolated topic (one off). Adopted and integrated in all that we do.

A more detailed quantitative picture of the ways in which Enviroschools facilitators have helped schools to weave EfS into the curriculum is provided in Table 22 below. It shows that enviroschools were most likely to develop EfS as an integrated theme across a syndicate or the whole school and/or as an extra/co-curricular activity or group. Few enviroschools (10 percent) were offering EfS as a separate course, subject or module, and only about a quarter of schools (23 percent) reported including EfS in all learning areas. The respondents noted that their EfS, when not across all learning areas, was delivered mainly in science, followed by arts, technology, social sciences and English or languages. The prevalence of EfS in science over other learning areas has been previously reported (Cowie et al., 2004), and indicates a greater level of inclusion with environmental than other aspects of sustainability.

Table 22: Description of how enviroschools lead teachers reported that facilitators had helped EfS develop in the school

	Percent of enviroschool respondents
As an integrated theme across syndicate or school	58
As an extra/co-curricular activity or group	52
Included in all learning areas	23
As a separate interdisciplinary EfS course, subject, or module	10
Included in one or more (but not all learning areas)	35
<i>Science</i>	30
<i>Arts</i>	18
<i>Technology</i>	17
<i>Social Sciences</i>	17
<i>English or languages</i>	17
<i>Health and physical wellbeing</i>	13
<i>Mathematics</i>	5
<i>Other</i>	3

This data shows that approximately half of the enviroschools respondents were offering EfS as an extra or co-curricular activity. This would include such activities as tending gardens during school breaks, or participating in community planting or beach clean-ups. One case study teacher described the genesis of a gardening club at her school:

I feel so many children don't know where their food comes from. Especially younger children and so I presented the idea of starting a gardening club, that's how it started. Then the children came and we looked around the school, then we looked at the Enviroschools plan together. So we brainstormed all the sorts of things they'd like to do, and eventually someone said well we haven't got any vegetables in the school. So we discussed it and they decided right let's have a vegetable garden. So we went around the school, they found a spot, and they wrote letters and asked if they could use that place, then I applied for the funding. So we had it built and the children did all the planning, they planned where the boxes were going to go and they measured it all out and made up a mock one and cut out the paper and laid it out to see if it would fit. So it was all their decision-making with guidance from us of course. Then we had it built by us and a couple of other parents, and then had the soil delivered and all the children, my gardening group, they did all the work carrying all this dirt, it was wonderful. Then they decided what to plant and I showed them books on organic gardens and oh it was just absolutely exciting.

Another teacher described actions that were taken on World Environment Day:

It just became a great wonderful day. Oh, every class planted something, every class, we planted the orchard down here and fruit trees, and there was a 20 kilo bag of daffodils that were planted around the school and just planting and growing and digging all day, and some of the children went off and did things outside the school as well.

Additionally, nearly 60 percent of respondents noted that EfS was integrated across a syndicate or their whole school. One teacher described how they planned their EfS using a mix their own and Enviroschools documentation:

We use our own planning form. Some people in the school do use the one from the Enviroschools Kit, they have used that but I personally don't do that, I have a rich task template which we do and that's, it's not a mish mash of curriculum areas, but each curriculum area, and then how we have threaded through. And I would have environmental education sitting within that.

Analysis of junior primary school curriculum plans at another case study school revealed deliberate integration of EfS into each plan as a separate objective to be achieved.

One case study student focus group discussed the student-led development of a school project to design a gazebo in their wood technology class that would serve as a recycling station for the school. The students spoke about presenting the project at Youth Jam and the positive reception they received. They were able to use their presentation at the Jam to integrate their environmental learning across several subjects, incorporating achievement in their horticulture, technology and English subjects.

6.3 Student learning opportunities and outcomes

As the scope of this evaluation did not allow extensive data gathering directly from students, this section presents evidence about student outcomes gathered largely from the perceptions of the Enviroschools facilitators and the enviroschools teachers. We have made the point earlier that, in evaluating the outcomes of EfS, a teacher input—student output model is not the most appropriate. As such, this data should be read with that in mind. There is a small amount of data gathered directly from students through the case study focus groups.

Working with students

In the first phase of this evaluation, Enviroschools facilitators were asked about whether they worked with students in ways that responded to the Enviroschools principles of education for sustainability and genuine student participation. Their responses are shown for four key areas in Table 23 below.

Table 23: Facilitators who reported working with students in these ways

	Most schools %	All schools %	Some schools %	No schools %
Provide knowledge about environment or sustainability (n=29)	38	45	17	0
Encourage student participation in decision-making (n=30)	27	57	13	3
Teach practical environmental skills to students (n=30)	30	17	40	13
Help students with environmental action projects (n=30)	37	17	43	3

This table shows that facilitators are more likely to be involved with students in providing knowledge and encouragement rather than being actively involved in teaching skills and helping with action projects.

Respondents in the enviroschools lead teacher survey were asked to consider one unit of work or learning experience that their students were involved in that exemplified their approach to EfS, and to respond to several questions with regards to that piece of work. The respondents were asked to briefly describe the topic of work and the responses are shown in Table 24 below.

Table 24: Topics of work that teachers reported engaging students in for EfS

Work theme	Examples of topics
Water	Stream-care vegetation project, plantings in dairy farming catchments, stream monitoring.
Energy	Creating sustainable environments in relation to power generation and consumption (pollution, renewable, non-renewable resources) compared to home/school power consumption and students discussed ways this could be reduced.
Waste	How to reduce waste in lunch boxes.
Gardening	Edible gardens—children working together to create a number of edible gardens around the school. Some general, a herb garden, plans for fruit trees in a specific area, etc.
Eco-building	Students (130) over 4 years planning for the building of an eco-classroom that will be multi use, act as a living/ monitoring laboratory that decreases the carbon foot print

These topic themes are typical of what has been reported previously by schools engaged in environmental work (Cowie et al., 2004).

Student outcomes

Student outcomes were examined through the enviroschools lead teacher survey and interviews with school staff and a small number of students in the case study schools. A series of questions were posed in the enviroschools teacher survey and responses were analysed against the concept of action competence. This concept has been developed internationally (B. Jensen, 2002; B. B. Jensen & Schnack, 1997) and refers in this evaluation to competence to act with reference to the environment and sustainability. A number of aspects have been identified to contribute to action competence and these are shown with the responses in Table 25 below, which shows how enviroschools teacher survey respondents felt that their work in the unit they described had impacted upon students.

Table 25: Enviroschools teacher respondents perceptions of the impacts of their EfS work on student outcomes in their schools

Item	Aspect of action competence	Strongly agree % (n=60)	Agree % (n=60)	Disagree % (n=60)	Strongly disagree % (n=60)	No response % (n=60)
Developed their critical thinking skills	Knowledge	27	60	2	0	12
Questioned and researched about an environmental issue	Knowledge	35	47	7	0	12
Developed their understanding about the biophysical environment	Knowledge	27	53	7	0	13
Used a variety of knowledge systems to understand a sustainability issue	Knowledge	17	57	7	0	20
Questioned and learned about big picture sustainability themes eg, social justice, globalisation	Knowledge	15	58	13	0	13
Developed an understanding of relationships between local, national, and global sustainability	Knowledge	17	55	15	0	13
Reflected on their personal understandings of sustainability	Reflection	15	65	5	0	15
Imagined the future	Visioning	30	48	7	2	13
Took action for sustainability	Action-taking	37	45	3	0	15
Made key decisions about what to study or how to take actions	Action-taking	32	48	10	0	10
Increased their engagement, interest, or motivation in learning	Connectedness	38	48	0	0	13
Clarified their ethics and values in relation to sustainability	Connectedness	15	60	8	0	17
Built up a picture of a complex phenomenon and change processes	Connectedness	20	32	27	2	20

As can be seen in Table 25, enviroschools teachers believed the impact had been:

- Strong in students developing knowledge and reflection aspects including critical thinking skills, questioning and research of environmental issues—generic outcomes that are strongly emphasised by *The New Zealand Curriculum* (Ministry of Education, 2007a).
- Strong in visioning and action-taking, key aspects of EfS.

- Strong in participating and increasing engagement in learning, which are also strongly emphasised by *The New Zealand Curriculum* (Ministry of Education, 2007a).

Data from the case study interviews backed up these findings. A principal from one of the case study schools described how work in a restoration project led to a drama production which demonstrated to her what she saw as the transformation in some students' learning:

Two of those classes would have got to what I call transformation. Because of the steps that they went through, so they shifted from a real experience in the environment through to discussing, researching, presenting and then enacting.

An envirogroup student in one case study school indicated that he had undergone some form of transformation in his thinking as a result of attending a Youth Jam. He said that attending the Youth Jam "really changed me ... just showing all these mean and really good ideas about keeping their schools and townships clean, I thought 'that is really awesome, I want to try that out in [our town]'". Analysis of EnviroSchool Milestone reports also shows a range of positive feedback from students regarding the Youth Jam, with indications that such transformations in thinking and acting were commonplace amongst attendees.

A case study teacher spoke about the technology students who were building a gazebo at the school for a recycling station:

That's a recycling gazebo and that was actually built by some of my environmental students, and I was amazed when I heard they were doing that. They hadn't been told by anyone, that was their idea and that was really cool.

Some Year 6 students in another case study school described how their swimming pool was solar heated, and one student was able to quote very accurately the figures for the cost of heating using other means, and the cost of the solar panels, showing some good understanding of the economics. These Year 6 students knew that solar heating was good for cost saving and also good for the environment. One said "you won't be producing energy as man-made energy, you're using natural energy of the sun". This same group of students also commented on the vegetable garden in their school, and how it had helped their learning and made money for the school:

It's a really important thing for our school, because it has taught us about how to grow things, it has taught us maths and science, plus it has made money for our school. Our teacher made chutney from the tomatoes and sold it at the local market and she got quite a lot of money.

This illustration of student learning outcomes, and the students' understanding of these outcomes in terms of sustainability is a clearly desired benefit of EfS. These outcomes were seen to be part of the school culture in the case study schools. One case study teacher described how she was showing visitors around her school when they observed students carrying out sustainability action:

Yesterday we were taking these people round and just as we were walking round three little kids from a Year Two class came out with their paper recycling box and their food recycling and their other recycles, and [the visitors] went oh, oh, what's happening. I said 'oh this isn't happening, it's in process', and so they all took photos. It was quite interesting really, they said 'well how do you get people to do it', and we sort of thought, well it is completely in the culture of the school.

A number of teachers in the case studies commented on the difficulties of getting teenagers enthused and involved in taking action for the environment. However, one teacher at high school level described how she felt environmental action could become normal for this age group:

I just think it is their hormones, puberty, they're always really up and down, they care more about socializing. But if you normalise things, like make things like planting trees a normal thing to do, or worm farming, gardening then that's the way it is going to have to be in the future.

Transfer from school to home

When asked in the survey, just over half (54 percent) of the enviroschools lead teachers agreed that their EfS delivery at school had led to changes in students lifestyles or practices outside school. These teachers were asked in what ways they had seen students transferring their learning from their environmental/sustainability studies to their homes. Table 26 summarises the responses.

Table 26: Enviroschools lead teachers' descriptions of students' changed lifestyles or practices after an EfS learning experience

Code	No. of responses (n=43)	Examples of comments
Waste, energy and water use	17	Many students have made the effort to reduce power consumption at home through the knowledge they developed and educating their parents about this.
Gardening	8	Many children have now get vegetable gardens at home. Parents came and visit senses garden with children. Talk about what they could plant. Families have learnt how to use mulch.
Reduce packaging	7	Reminding parent to take bags to the supermarket.
Awareness raising	6	Some discussion around sustainability issues. Some parental involvement in enviro-projects/ enviroschools support, A lot more interest/ awareness in biodiversity.
Advocating for riparian planting	2	Asked farming parents about fencing off waterways and planting of trees along local rivers.
Transport	2	Children are meeting as street groups to walk together. More parents are walking with junior children.

Additionally, in the case studies, teachers and students spoke about transferring their environmental learning from school to home. These comments are indicative of that transfer:

The youngest kids they are funny, they tell their parents off for what they pack in their lunch box and everything (case study teacher).

I mean the parents who have taken it on board are sending lovely little lunch boxes all of recyclable bags and containers and it is not a problem. It is so much easier and it saves money, I think parents realise that as well (case study teacher).

When we did this last year when we did this big worm selling process, and started doing the worms, started off getting these horror stories, 'oh you are studying worms', but by the end of it I had six or eight families who asked for worms and created their own wormery (case study teacher).

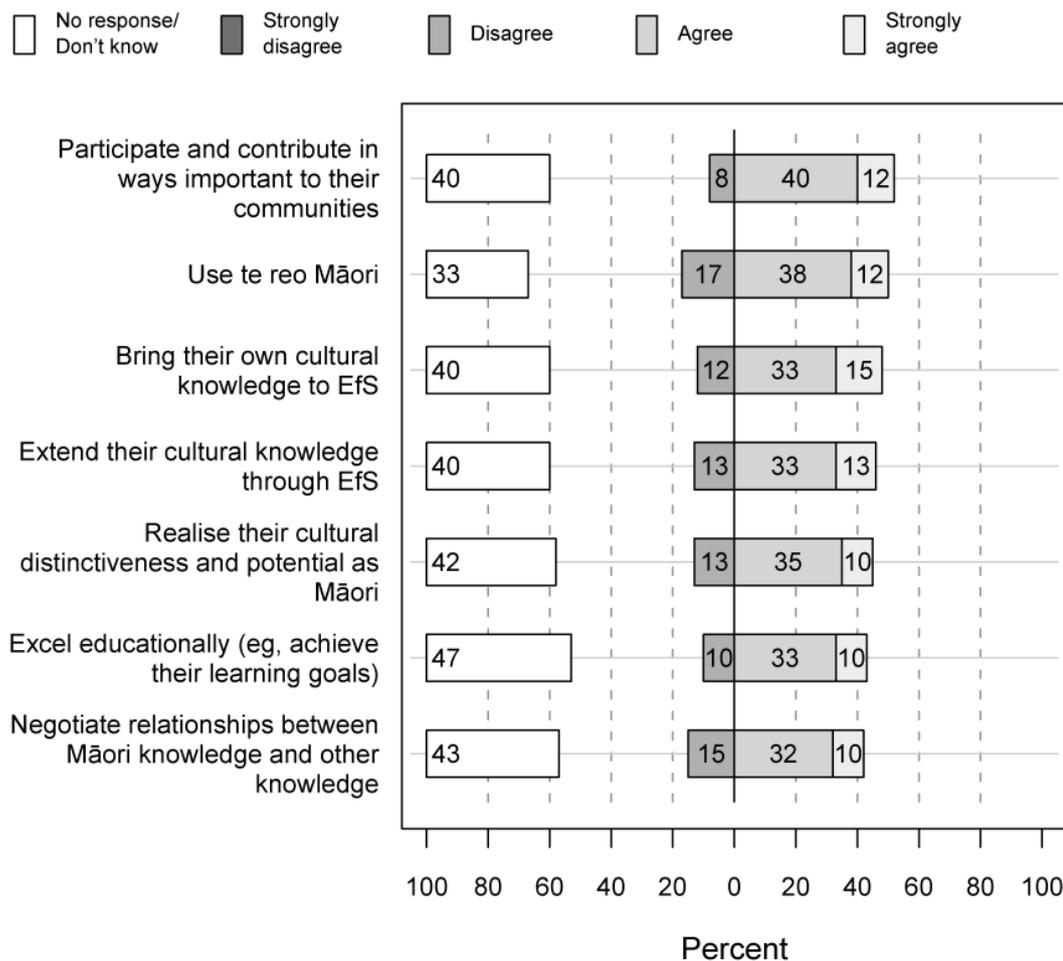
An envirogroup focus group of three Year 12 students all agreed that their environmental practices go home with them. They said that they now consider what they buy, one student from a farm now thinks about chemicals going into creeks, and how to dispose of farm chemicals safely. They thought that their learning at school had definitely changed their behaviour at home, and that their parents had changed their behaviour considerably at the same time due to the messages they were bringing home from school. In a second case study school, a focus group of students also said they

had changed what they do at home. Two students who were recent immigrants felt they now did a lot more recycling and gardening than they used to at home.

Māori perspectives

A principle of the Enviroschools Programme is inclusion of Māori perspectives of the environment. Just over half (51 percent, n=60) of enviroschools lead teachers felt that their EfS work drew on, or developed students’ understandings of Māori concepts. We further developed a range of survey items based on Ka Hikitia (Ministry of Education, 2008) in an attempt to understand the extent to which EfS learning opportunities might enable Māori students to participate as Māori in EfS learning experiences. Responses to these items are shown in Figure 10 below. At least a third of respondents did not respond to these questions, but those that did indicated that Māori students were able to contribute in ways important to their communities, use te reo Māori, bring their cultural knowledge to EfS, extend this knowledge, and excel educationally. Overall the items suggested that, at least in some schools, EfS contributed to affirming and realising Māori students’ potential. Least supported amongst these items was students’ ability to negotiate the interface between Māori knowledge and other knowledge, which was an area that teachers also felt they lacked expertise in.

Figure 10: Survey respondents’ assessment of EfS contribution to Māori students’ success



The two case study schools revealed quite different emphases on Māori perspectives and cultural interfaces. In the composite school with an immersion unit, the Māori influence on the school was seen as strong. The school grounds contain a significant former Māori village site, which the school now is replanting and maintaining as an open area for

camps and learning. In this school, the staff generally saw Māori perspectives as playing a key part. This was seen to allow for different voices to be heard in the school, as the principal noted:

I think if you see that sustainability and enviro has something, a huge connection with indigenous communities, if you understand that, if you begin to engage with what that might mean around decision making and making decisions for the whenua then you at least open up the opportunity to access another wisdom in the place.

The enviroschools lead teacher agreed, saying “I think that education for sustainability just picks up on Māori values and there is a very strong Māori voice in this school and it is a legitimate voice”. The connection between sustainability and indigenous knowledge was a strong feature of learning in the immersion unit.

In contrast, the second case study school had few Māori students and approximately 25 percent Asian students. There were examples of integrating Māori knowledges into the curriculum eg, using the legend of Maui trapping the sun as an entry into a unit on solar energy, but there was equal attention paid to the interface with Asian culture. As one teacher in the school described:

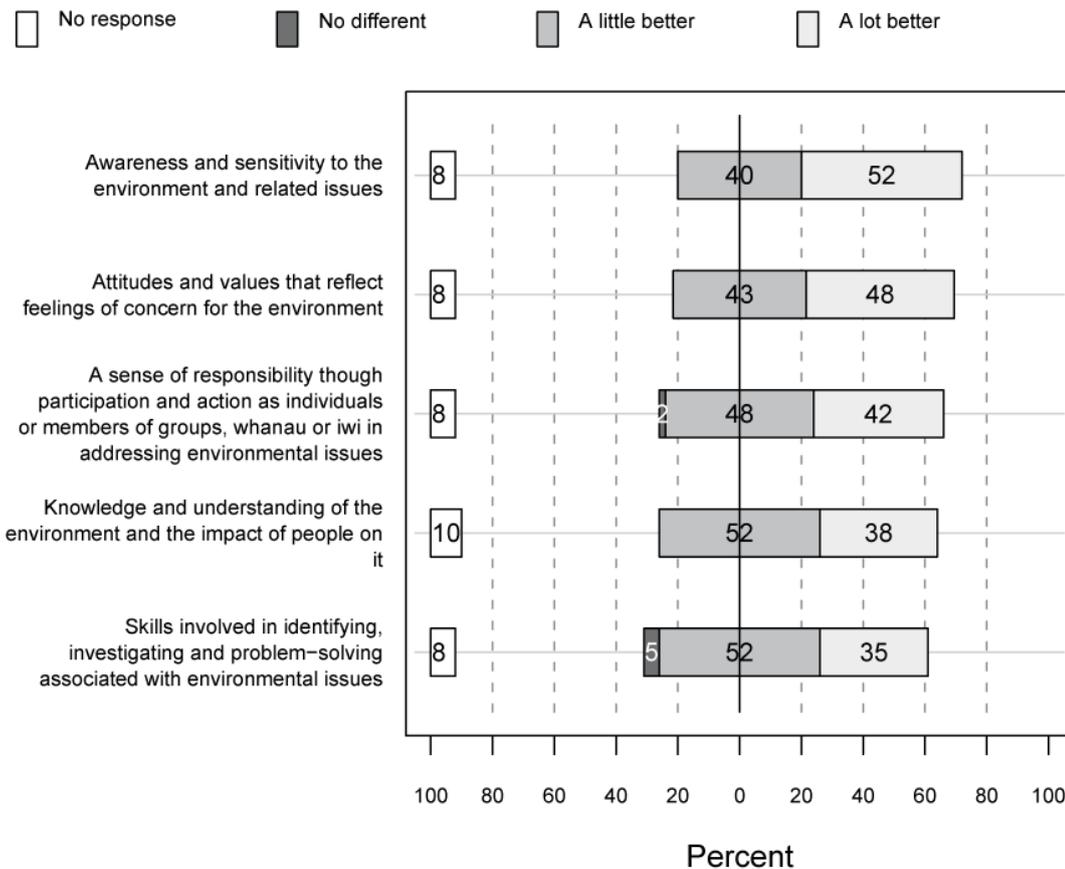
Well last year I had a third of my class from either Sri Lanka or India so we had all year I think, an aspect of their culture was always filtering in, and we had a Diwali day in our class as well, we all got dressed up and we all had food and candles and they went outside and made patterns. So to me their culture is very important.

The principal at this school emphasised an understanding of a multi-cultural future for New Zealand, which recognises Māori perspectives as important, but also acknowledges the range of other cultures, including Pākehā, that are important in students’ learning.

Aims of EfS

Finally, as the *Environmental Education Guidelines* (1999) are still the only official government document that directly supports EfS in schools, the enviroschools teachers were asked how the students in their schools were achieving the five aims specified on page 9 of that document. These aims are based on the Tblisi Declaration (UNESCO, 1978). The teachers’ responses are shown in Figure 11 below.

Figure 11: Teacher respondents' evaluation of the realisation of the Environmental Education Guidelines aims for students in their EfS work



This data shows that the enviroschools lead teachers felt that by providing EfS opportunities for their students at school had led to some development in all the aims of the Guidelines. Importantly, the development of attitudes and values for the environment rated highly, which aligns well with the value of ecological sustainability as expressed in *The New Zealand Curriculum* (Ministry of Education, 2007).

6.4 Summary

In summary, this section has reported on the impact of the work of the Enviroschools Programme on three levels; organisational change, teacher practice and student outcomes. Key findings were:

Organisational change

- A range of year levels are being engaged in EfS in schools but it is more challenging to engage secondary students.
- Enviroschools teachers reported that the Enviroschools facilitators were having the most impact on school operational practices, curriculum and physical surroundings. Less impact was reported on organisational management.
- Changes to school sustainable practices such as recycling wastes were widely reported by enviroschools teachers.
- Leadership support was seen as vital to the success of EfS in schools and the development of an enviroschool. Most enviroschools respondents reported strong leadership support.

- Enviroschools teachers reported that through EfS there was greater student input into decision-making but that this was only successful when it was transparent and genuine.
- Enviroschools teachers reported that development of enhanced community interactions depended on the nature of their community.
- Enviroschools teachers reported that the main constraint to their development as an enviroschool was time to implement EfS.

Teacher practice

- Enviroschools teachers were strongly supportive of the professional development (PD) they received from the Enviroschools Programme. In-school PD was rated most highly.
- Enviroschools PD was most highly rated by enviroschools teachers as practical, enjoyable and helping teachers to incorporate environmental/sustainability content into their teaching.
- Enviroschools teachers reported that Enviroschools PD had helped them gain a better understanding of all aspects of sustainability, and how to apply these ideas personally and in their schools.
- Enviroschools teachers also reported that Enviroschools PD had helped them learn how to support student-planned actions, and teaching and learning approaches in EfS.
- Enviroschools teachers reported that Enviroschools PD had been of less help in understanding how to assess student achievement in EfS.
- Improvements to Enviroschools PD requested included more facilitator time.
- In terms of teacher change, both Enviroschools facilitators and enviroschools teachers stated that the biggest changes were in inclusion of more environmental/sustainability content in teaching and development of teaching styles that fostered more active student participation in their own learning.
- Enviroschools teachers reported that they were likely to be either delivering EfS as an integrated theme or as an extra/co-curricular activity.

Student outcomes

- Enviroschools teachers reported that their EfS work with students was mainly around the themes of water, waste, energy and gardening.
- Enviroschools teachers reported that they were seeing strong student outcomes in knowledge development, action-taking and increased engagement in learning.
- Most enviroschools teachers reported evidence of transfer of EfS learning from school to home.
- Some enviroschools teachers reported that their EfS teaching was helping students to develop a better understanding of Māori perspectives of the environment, and encouraging better Māori student achievement.

7. Future directions

This section examines what the Enviroschools staff believe is the potential for the future of the programme and what external support may be needed to achieve this potential.

7.1 Potential for the future

The overall feeling gained from this study was one of hope and optimism. The growth in numbers in the programme is taken as one indicator of progress and continuing applications to join the programme fuels this optimism. In particular, this growth is seen to be creating stronger networks within communities that are being fostered at the regional and local level. The belief in the kaupapa and the work that they are doing was infused through all study participants, and creating a momentum that is ramifying in many directions. As two Enviroschools staff members said:

The potential that we are seeing in the networks that have been created in the regions is for really strong regional networks of schools that are really well linked with their communities, that are starting to be seen as the knowledgeable leaders and decision-makers for some of the really hard stuff that is going to be coming up.

I think we are in a fabulous position while working collaboratively to say well this is one part of the solution, I mean it isn't all about Enviroschools, or Enviroschools kind of taking over everything. I don't see it at all like that, but what I see is that we as a collaborative group of people have created a programme and a network that is really supportive and that people want to be part of and they can then evolve that in a way that's right for their community and their school. So I think that's what gives it its momentum.

For some respondents continued momentum would be based on the public messages around sustainability and environmental concerns. For example, if there was a reversal in belief in human-induced climate change, there may be less interest in the programme. As one Enviroschools facilitator said:

Depends on next 5–10 years, whether environmental problems get a lot worse, and whether society comes to value sustainability. If the public have fears about the future, then funding will continue. I think if the Enviroschools Programme fell over, then many schools would stop doing environmental/sustainability stuff. Some schools would carry on as they see sustainability as intrinsically valuable, and the multiple perspectives it brings as something to value.

For others, continued progress would be based around relationship and network development. However, concerns remain about a perceived lack of government support through lack of specific curriculum direction and under-funding. This was seen to be inhibiting the integration of EfS into the curriculum such that it became a normal part of school life.

In the facilitator survey, the main hopes for the future of facilitation work were that there would be more enviroschools (7/31), schools would work with their communities towards sustainability (6/31), EfS would become an accepted part of the school curriculum (6/31), and EfS would become a part of normal school life (6/31). There were also calls for more EfS in pre-service teacher education, enough trained Enviroschools facilitators to meet demand, including in the early childhood sector, and that Māori students were engaging with Māori views of sustainability. One facilitator said, "It may sound odd, but I would like to see us do ourselves out of a job. I would like to think that in the future we won't be needed as schools will be doing all the things we want them to".

7.2 What could the Enviroschools Programme provide?

The enviroschools lead teachers were asked what more could the Enviroschools Programme do to help develop EfS in their schools. Responses are shown in Table 27 below. The most common comment was praise for the facilitators and the programme, and no requirements for further help.

Table 27: Enviroschools lead teachers' comments on what more the Enviroschools Programme could do for their EfS

Code	No. of responses (n=30)	Examples of comments
Positive feedback	10	Very happy with our programme at the moment, we have excellent support and are moving forward at an appropriate pace.
More facilitator hours	4	More hours for the facilitators to be able to work with every teacher in the school.
Teacher release time for EfS	4	Release time for TIC enviro education to ensure smooth running of school wide programme).
Help with leadership support	3	Educate principals and BOT about EFS. Tokenism is reflected by their actions and ideas. It is difficult as a teacher to educate and inspire them alone).
More PD opportunities	3	I'd like to see a course for Enviroschools lead teachers on look carefully at the curriculum and how to implement in schools. Cluster group meetings at Enviroschools to share ideas/problems/successes in their schools.
Improve the awards scheme	3	Restructure awards system to make it more achievable for secondary schools.
Work more with students	2	Come into the school and actually run enviro groups and see the students as groups, etc. Not a lot of time is needed but support to maintain momentum so students become self sufficient.

Some specific comments made by single teachers included:

I think your facilitators are outstanding and with the number of new schools coming on board there needs to be an increase in Enviroschools and sustainability education personnel (facilitators). The education is so incredibly relevant in today's global warming environment. After 33 years teaching I no longer have to go around picking up Gladwrap—my kids have banned it. Yeah!

Take the stress off ie, "showing casing" schools and creating such extensive "tracking" records that we feel impelled to buy into.

Fundraising to complement projects eg, our eco-housing theme for 2009 involving retrofitting and building. One is hard pressed to fund the wonderful ideas we have. We're teachers, and although fundraising can be integrated into the programme, it can become a huge task.

In discussions with Enviroschools national staff at the close of this evaluation period, there was a belief that the programme was entering a new phase. The duration and breadth of the programme has now produced a large number of enviroschool graduates, particularly at primary, and as these students move into the secondary arena, there is evidence of heightened awareness at that level. There was a feeling that these students are now looking to drive social change. As some of these students leave school, there was a feeling that was a demand for an outlet for youthful energy towards sustainable practices in the community. One such outlet planned by the Enviroschools Programme is Festival 2010—a project aiming to involve all enviroschools and their communities and some of that youthful energy. A website is planned on which schools can record their actions and which they can come to understand how actions relate to

mitigation of sustainability issues. In this way, it is hoped to be able to show how what actions are most effective in achieving desired sustainable outcomes.

7.3 What could the Ministry of Education provide?

The enviroschools lead teachers were asked what more could the Enviroschools Programme do to help develop EfS in their schools. Responses are shown in Table 28 below. The most common comment was praise for the facilitators and the programme, and no requirements for further help.

Table 28: Enviroschools lead teachers' comments on what apart from the Enviroschools Programme could be done to help their EfS

Code	No. of responses (n=37)	Examples of comments
More funding options	6	Funding relevant to sustaining and enhancing our environments instead of fundraising, etc)
How to integrate EfS into the curriculum	5	Practical planning sessions to assist teachers to integrate EFS across the curriculum.
Exemplar units of work	2	Unit plans of work to be shared among other schools that have been successful.
Hands-on workshops	2	Practical, hands-on workshops eg, establishing organic gardens, composting, stream-care monitoring, bio diversity, field work, etc
More government support	2	I guess it has to come from a Governmental level that globally EE is the most important subject and way (integrated with science/tech etc) and thinking skills, so more funding to spread the word further and include more schools would be great.

Some specific comments made by single teachers included:

More ministry money for EFS advisors to support schools. Ministry to be more flexible in property management guidelines/policy to allow students to be a part of planning for sustainability building/futures.

When ERO visits schools, maybe they could take into account the EFS in the school; or have separate body evaluating EFS in schools.

Try taking a sample group of students from enviro schools (along the lines of NEMP) and evaluate knowledge, measure shift, etc. This would be interesting and would inform practices.

7.4 Summary

In summary, this section has reported on possible future directions for the Enviroschools Programme and EfS in New Zealand as requested by participants in this study. Key findings were:

- A strong belief from all participants in the Enviroschools kaupapa and the work that the Enviroschools Programme is doing.
- A need for clearer strategic support from central government.
- A request for more Enviroschool facilitator hours to allow greater progress to be made towards a sustainable school.

- A request that the Ministry of Education provide more support in the form of how to integrate EfS in to the school curriculum, provision of exemplars and a strategy that provides for a holistic approach to sustainability to everything that the Ministry is engaged in with schools, from school buildings to the Education Review Office.

Note: A summary of the findings of this evaluation is presented in the accompanying report, *Education for sustainability in New Zealand schools: An evaluation of three professional development programmes*, together with an analysis of school-based EfS provision in New Zealand and recommendations for future directions.

References

- Blanchet-Cohen, N. (2006, April). *Rainbow warriors: The unfolding of agency in early adolescents' environmental involvement*. Paper presented at the American Educational Research Association, San Francisco.
- Bolstad, R., Cowie, B., & Eames, C. (2004). *Environment education in New Zealand schools: Research into current practice and future possibilities* (Vol. 1–4). Wellington, New Zealand: Ministry of Education.
- Chapman, D., & Eames, C. (2007). *Position paper: Backgrounding new Guidelines for EE/EfS*. Retrieved 9 April, 2009, from http://www.nzae.org.nz/efs_position_paper.htm
- Clark, H. (2007). *Prime Minister's Statement to Parliament*. Wellington: 13 February, 2007.
- Cowie, B., Eames, C., Harlow, A., Bolstad, R., with, Barker, M., Keown, P., et al. (2004). *Environmental education in New Zealand schools: Research into current practice and future possibilities. Volume 3: A critical stocktake of the characteristics of effective practice in environmental education in New Zealand schools and kura kaupapa Māori*. Wellington, New Zealand: Ministry of Education.
- Eames, C., Bolstad, R., & Robertson, M. (2006). *The State of Environmental Education in New Zealand: A baseline assessment of provision in the formal sector in 2006*. Wellington, New Zealand: WWF-New Zealand.
- Enviroschools. (2009). *Enviroschools programme*. Retrieved 30 April, 2009, from <http://www.enviroschools.org.nz/>
- Enviroschools Foundation. (2008). *Enviroschools Handbook*. Enviroschools Foundation.
- Enviroschools Foundation. (2009). *Enviroschools Kit*. Enviroschools Foundation.
- Ferreira, J., Ryan, L., & Tilbury, D. (2006). *Whole school approaches to sustainability: A review of models of professional development for pre-service teacher education*. North Ryde, Australia: Australian Research Institute in Education for Sustainability.
- Gooch, M., Rigano, D., Hickey, R., & Fien, J. (2008). How do primary pre-service teachers in a regional Australian university plan for teaching, learning and acting in environmentally responsible ways? *Environmental Education Research, 14*(2), 175–186.
- Guskey, T. R. (2000). *Evaluating Professional Development*. Thousand Oaks, CA: Corwin Press.
- Guskey, T. R. (2002). Professional development and teacher change. *Teachers and teaching, 8*(3/4), 381–391.
- Jensen, B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental Education Research, 8*(3), 325–334.
- Jensen, B. B., & Schnack, K. (1997). The action competence approach in environmental education. *Environmental Education Research, 3*(2), 163–179.
- Jickling, B., & Wals, A. E. J. (2007). Globalization and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies, 40*(1), 1–21.
- Keown, P., & McGee, C. (1999). *The final report of the Enviro-school monitoring project*. Hamilton: University of Waikato.

- Keown, P., McGee, C., & Carstensen, M. (1995). *The Enviro-school project baseline survey*. Hamilton: University of Waikato.
- Malone, K., & Tranter, P. J. (2003). School grounds as sites for learning: making the most of environmental opportunities. *Environmental Education Research*, 9(3), 283–303.
- Ministry for the Environment. (1998). *Learning to care for our environment: a national strategy for environmental education*. Wellington: Ministry for the Environment.
- Ministry of Education. (1993). *The New Zealand Curriculum Framework*. Wellington: Ministry of Education.
- Ministry of Education. (1999). *Guidelines for Environmental Education in New Zealand Schools*. Wellington, New Zealand: Ministry of Education.
- Ministry of Education. (2007a). *The New Zealand Curriculum*. Wellington, New Zealand: Learning Media.
- Ministry of Education. (2007b). *Request for proposals: Evaluation of Education for Sustainability*. Ministry of Education.
- Ministry of Education. (2007c). *Statement of Intent 2007–2012*. Wellington, New Zealand: Ministry of Education.
- Ministry of Education. (2008). *Ka Hikitia*. Retrieved 12 May, 2008, from <http://kahikitia.minedu.govt.nz/default.htm>
- Parliamentary Commissioner for the Environment (PCE). (2004). *See Change: Learning and education for sustainability*. Wellington, New Zealand: PCE.
- Parliamentary Commissioner for the Environment (PCE). (2007). *Outcome Evaluation: See Change*. Wellington, New Zealand: PCE.
- Poskitt, J., & Taylor, K. (2008). Sustaining professional development: Rhetoric or reality? *Journal of Educational Studies*, 43(1), 21–32.
- Statistics New Zealand. (2002). *Monitoring progress towards a sustainable New Zealand: an experimental report and analysis*. Wellington: Statistics New Zealand.
- Sterling, S. (2001). *Sustainable education: re-visioning learning and change*. Bristol: Green Books.
- Tilbury, D. (1995). Environmental education for sustainability: defining the new focus of environmental education in the 1990's. *Environmental Education Research*, 1(2), 195–212.
- Tilbury, D., & Wortman, D. (2005). Whole school approaches to sustainability. *Geographical education*, 18, 22–30.
- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher learning and professional development: Best evidence synthesis Iteration*. Wellington, New Zealand: Ministry of Education.
- UNCED. (1992). *Agenda 21*. Retrieved 10 July, 2007, from www.unesco.org/education/English/chapter/chapter.shtml
- UNESCO. (1978). The Tbilisi Declaration. *Connect: the UNESCO-UNEP environmental education newsletter*, 3(1).
- UNESCO. (2007). *Education for Sustainable Development*. Retrieved 20 July 2007, from http://portal.unesco.org/education/en/ev.php-URL_ID=23280&URL_DO=DO_TOPIC&URL_SECTION=201.html

Appendix 1A:

Code: []

<p>Centre for Science and Technology Education Research</p> <p>The University of Waikato</p> <p>Private Bag 3105</p> <p>Hamilton, New Zealand</p>	<p>Telephone 64-7-838 4357</p> <p>Facsimile 64-7-838 4272</p> <p>Email c.eames@waikato.ac.nz</p>	
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ENVIROSCHOOLS FACILITATORS SURVEY

This survey is for those Enviroschools facilitators who are NOT also employed as EfS advisers as part of the National EfS team. Note, for the purposes of this survey, the EfS advisers refer to those in the National EfS team who are employed by universities as part of the School Support services.

This survey focuses on your work as an Enviroschools facilitator in the compulsory school sector. If you also work in the Early Childhood sector, please do not consider this work in your responses.

Please fill in this survey by ticking the boxes, by writing in the spaces provided or circling the appropriate number. If you need more space to write feel free to do so on extra paper and include that.

Thank you!

Please return the survey to Chris Eames in the envelope provided

by Monday 26 November 2007.

a) Your position

1. What region do you work in?

- ^a Northland
- ^b Auckland
- ^c Waikato
- ^d Bay of Plenty
- ^e Hawkes Bay
- ^f Manawatu-Wanganui
- ^g Taranaki
- ^h Wellington
- ⁱ Nelson, Tasman & Marlborough
- ^j Canterbury
- ^k Otago
- ^l Southland

2. Which of the following best describes your facilitator employment situation?

- ^a Permanent
- ^b Fixed-term
- ^c Contractor

3. (a) Which of the following best describes the hours you work in your Enviroschools role?

- ¹ Part-time
- ² Full-time

(b) If part-time, about how many days per month on average do you work as an Enviroschools facilitator?

- 1-5
- 6-10
- 11-15
- 16-20
- 21-25
- >25

(c) If part-time, approximately what portion of all your work time do you currently spend as an Enviroschools facilitator?

- <25%
- 25-50%
- 51-75%
- 76-99%
- 100%

4. How many schools, under the following types, have you worked with at any stage in over the past two years (2006-2007) as an Enviroschool facilitator? (your best guess is fine)

Type of school	Number of schools
a) Primary (up to Y6 or Y8)	
b) Intermediate	
c) Composite school (Area or Y1-13)	
d) Secondary school (Y8 or Y10 plus)	
e) Kura Kaupapa Māori	
f) Other, please describe _____	
g) TOTAL	

5. How many of each of these schools have you worked with? (your best guess is fine)

Type of school	Number of schools
h) Very small (under 100)	
i) Small (100–249)	
j) Medium (250–499)	
k) Large (500–999)	
l) Extra large (over 1000)	
m) TOTAL	

b) Your background

6. In what year did you become an Enviroschool facilitator?

- 2007
 2006
 2005
 2004
 2003
 2002
 Other, please give year: _____

7. What was your job (or otherwise) immediately before that?

8. Which of the following education/environmental roles have you held in the past?

(Tick all that apply)

- ^a Primary teacher
 ^b Secondary teacher
 ^c Staff member in an environmental non-governmental organisation
 ^d Staff member in a Council in another area
 ^e School Advisor outside of EfS
 ^f Environmental consultant
 ^g Other education/environmental role, please describe: _____

9. Which of these are part of your background? (Tick all that apply)

- ^a Personal environmental involvement
 ^b Membership of environmental group(s)
 ^c Youth/community work
 ^d Tertiary education in an environmental/sustainability area.
 If so, please describe _____
 ^e Other environmental background (please specify) _____

10. What is your highest qualification?

c) Conceptualising your work

11. What is your understanding of the main purpose of the work of Enviroschools facilitators?

12. Which term do you prefer to describe your area of work?

- | | |
|--|--|
| <input type="radio"/> ^a Environmental Education (EE) | <input type="radio"/> ^b Education for Sustainability (EFS) |
| <input type="radio"/> ^c Education for Sustainable Development (ESD) | <input type="radio"/> ^d Environmental education for Sustainability (EEFS) |
| <input type="radio"/> ^e Other, <i>please specify:</i> | |
| <input type="radio"/> ^f No preference | |

13. If you have a preference in Q12, why do you prefer the term you chose?

14. There are various “elements” within the concept of sustainability. On the table below, please rate:

- a) How well you think you understand the implications that each has for how schools, teaching and learning might ideally operate
- b) How well you think schools you work with understand the implications that each has for how schools, teaching and learning might ideally operate

	a) YOUR understanding				b) SCHOOLS' understanding			
	Very well	Well	Not very well	Don't know	Very well	Well	Not very well	Don't know
a) Environmental aspects of sustainability	1	2	3	4	1	2	3	4
b) Social aspects of sustainability	1	2	3	4	1	2	3	4
c) Cultural aspects of sustainability	1	2	3	4	1	2	3	4
d) Economic aspects of sustainability	1	2	3	4	1	2	3	4
e) Political aspects of sustainability	1	2	3	4	1	2	3	4

15. Would you like to make any comments about your response to the above question?

16. How well do you feel that the following are understood by:

a) Yourself

b) The schools you work with

	a) YOUR understanding				b) SCHOOLS' understanding			
	Very well	Well	Not very well	Don't know	Very well	Well	Not very well	Don't know
a) The aims of EE/EfS in schools generally	1	2	3	4	1	2	3	4
b) The Environmental Education Guidelines	1	2	3	4	1	2	3	4
c) The purpose of the EnviroSchools Programme at a regional level (working with schools)	1	2	3	4	1	2	3	4
d) The purpose of the EnviroSchools Programme at a national level (what National Office provides)	1	2	3	4	1	2	3	4
e) The operation of the EnviroSchools Programme	1	2	3	4	1	2	3	4
f) The purpose of the EfS advisory service in schools	1	2	3	4	1	2	3	4
g) The purpose of the Mātauranga Taiao facilitation programme	1	2	3	4	1	2	3	4

17. Currently, how well do you feel that you understand the following:

	Very well	Quite well	Not very well	Don't know
a) A whole school approach to sustainability	1	2	3	4
b) The role of organisational management in a whole school approach	1	2	3	4
c) The role of operational practices in a whole school approach	1	2	3	4
d) The role of living curriculum in a whole school approach	1	2	3	4
e) The role of physical surroundings in a whole school approach	1	2	3	4
f) The EnviroSchools Guiding Principles	1	2	3	4
g) The EnviroSchools Zero Waste theme	1	2	3	4
h) The EnviroSchools Living Landscape theme	1	2	3	4
i) The EnviroSchools Healthy Water theme	1	2	3	4
j) The EnviroSchools Ecological Buildings theme	1	2	3	4
k) The EnviroSchools Precious Energy theme	1	2	3	4
l) The action learning cycle	1	2	3	4
m) How teachers teach	1	2	3	4
n) Teacher planning processes	1	2	3	4
o) How students learn	1	2	3	4
p) How to assess student achievement in EE/EfS	1	2	3	4

d) Supporting your work

18. On the table below, please rate the following resources in terms of:

a) How frequently you use each to support your work

b) How useful you find each to share with schools

	a) How often for you?				b) How useful for schools?			
	Regularly	Occasionally	Never	Don't know	Very useful	Useful	Not useful	Don't know
a) Environmental Education Guidelines	1	2	3	4	1	2	3	4
b) Enviroschools Kit	1	2	3	4	1	2	3	4
c) MOE key messages on Education for Sustainability	1	2	3	4	1	2	3	4
d) TKI—EfS site	1	2	3	4	1	2	3	4
e) Other websites	1	2	3	4	1	2	3	4
f) Resources from other sources e.g. CDs, books, kits	1	2	3	4	1	2	3	4
g) Your own self-developed resources	1	2	3	4	1	2	3	4
h) People in the Environmental/sustainability community	1	2	3	4	1	2	3	4

19. Please describe any other resources that you find particularly useful for your work?

20. What professional development (or similar activities) have you received to help you in your role? (please tick if you have done it, and if so indicate how useful you found it overall)

	YES, took part	Very useful	Useful	Slightly useful	Not useful
a) Enviroschools Level One training	<input type="radio"/>	1	2	3	4
b) Enviroschools Level Two training	<input type="radio"/>	1	2	3	4
c) Annual Enviroschools Hui	<input type="radio"/>	1	2	3	4
d) Enviroschools Youth Jam	<input type="radio"/>	1	3	3	4
e) Enviroschools Regional Workshops	<input type="radio"/>	1	3	3	4
f) Enviroschools Māori perspectives	<input type="radio"/>	1	3	3	4

21. Please describe any other relevant professional development that you have found useful for your work? (please also indicate the year in which you took part)

22. What other professional development would you like?

e) Schools you work with

This next section asks you to think about all the schools you have worked with over the past two years (see Q4), separated by primary (Y0–8) and secondary level (Y9–13). If you only work in primary OR secondary, just complete the relevant part of the tables below.

23. Who have you worked with in schools?

	a) Primary schools				b) Secondary schools			
	All schools	Most schools	Some schools	No schools	All schools	Most schools	Some schools	No schools
a) Students	1	2	3	4	1	2	3	4
b) A “lead” EfS teacher in the school	1	2	3	4	1	2	3	4
c) <i>Some</i> teachers	1	2	3	4	1	2	3	4
d) <i>All</i> teachers	1	2	3	4	1	2	3	4
e) School management, e.g. principal	1	2	3	4	1	2	3	4
a) Community partner(s), e.g. local environmental group, regional council, or business	1	2	3	4	1	2	3	4
b) Other, <i>please describe</i> :	1	2	3	4	1	2	3	4

24. Thinking about your work with TEACHERS, how often do you do the following?

	a) Primary schools				b) Secondary schools			
	All schools	Most schools	Some schools	No schools	All schools	Most schools	Some schools	No schools
a) Share resources about EE/EfS	1	2	3	4	1	2	3	4
b) Provide knowledge about the environment or sustainability	1	2	3	4	1	2	3	4
c) Provide ideas for teaching processes	1	2	3	4	1	2	3	4
d) Teach practical environmental skills to teachers	1	2	3	4	1	2	3	4
e) Provide advice to help design a course/class/activity	1	2	3	4	1	2	3	4
f) Work one-on-one with a teacher	1	2	3	4	1	2	3	4
g) Work one-on-one with a teacher and their class	1	2	3	4	1	2	3	4
h) Support teacher learning communities <i>within</i> schools	1	2	3	4	1	2	3	4
i) Support teacher learning communities <i>between</i> different schools	1	2	3	4	1	2	3	4
j) Provide suggestions for EfS-relevant student assessment	1	2	3	4	1	2	3	4

25. To what extent do you think your work has impacted on the following for TEACHERS:

	a) Primary schools				b) Secondary schools			
	Strong positive impact	Some positive impact	No impact	Negative impact	Strong positive impact	Some positive impact	No impact	Negative impact
a) Change in teacher knowledge about environment/sustainability	1	2	3	4	1	2	3	4
b) Change in teacher beliefs about environment/sustainability	1	2	3	4	1	2	3	4
c) Change towards cooperative and action inquiry learning	1	2	3	4	1	2	3	4
d) Change in teacher-student decision-making relationships	1	2	3	4	1	2	3	4
e) Change towards critical reflective teaching	1	2	3	4	1	2	3	4
f) Change in teacher planning processes	1	2	3	4	1	2	3	4

26. Thinking about your work with STUDENTS, how often do you do the following?

	a) Primary schools				b) Secondary schools			
	All schools	Most schools	Some schools	No schools	All schools	Most schools	Some schools	No schools
a) Provide knowledge about the environment or sustainability	1	2	3	4	1	2	3	4
b) Encourage student participation in decision-making	1	2	3	4	1	2	3	4
c) Teach practical environmental skills to students	1	2	3	4	1	2	3	4
d) Help students with environmental action projects	1	2	3	4	1	2	3	4
e) Other (please specify)	1	2	3	4	1	2	3	4
f) Other (please specify)	1	2	3	4	1	2	3	4

27. To what extent do you think that your work has impacted on the following wider areas:

	a) Primary schools				b) Secondary schools			
	Strong positive impact	Some positive impact	No impact	Negative impact	Strong positive impact	Some positive impact	No impact	Negative impact
a) Change in incorporation of EE/EfS into the curriculum	1	2	3	4	1	2	3	4
b) Change in school sustainable practices	1	2	3	4	1	2	3	4
c) Change in school organisational management	1	2	3	4	1	2	3	4
d) Change in school physical environment	1	2	3	4	1	2	3	4
e) Change in a whole school approach to EE/EfS	1	2	3	4	1	2	3	4
f) Change in student involvement in actions for the environment	1	2	3	4	1	2	3	4
g) Change in student achievement	1	2	3	4	1	2	3	4

28. Thinking about how your work with schools influences student learning, to what extent do you think your work has impacted on the following EE/EFS aims for students?

Development of:	a) Primary schools				b) Secondary schools			
	Strong positive impact	Some positive impact	No impact	Negative impact	Strong positive impact	Some positive impact	No impact	Negative impact
a) Awareness and sensitivity to the environment and related issues	1	2	3	4	1	2	3	4
b) Knowledge and understanding of the environment and the impact of people on it	1	2	3	4	1	2	3	4
c) Attitudes and values that reflect feelings of concern for the environment	1	2	3	4	1	2	3	4
d) Skills involved in identifying, investigating and problem-solving associated with environmental issues	1	2	3	4	1	2	3	4
e) A sense of responsibility though participation and action as individuals or members of groups, whānau or iwi in addressing environmental issues.	1	2	3	4	1	2	3	4

29. What other positive impacts has your work as an EnviroSchools facilitator had? (e.g. for students, teachers, schools, communities etc)

f) Data collection and reporting

30. Please think about your ratings in the above section about the impact of your work. In the box below please describe the following:

a) What data (if any) have you collected to know you are making a difference?

(b) What data (if any) have schools you work with collected to know that they are making a difference with EE/EfS?

(c) What kind of evidence do you supply in reporting to the Regional Coordinator?

(d) How useful have you found these data/reporting areas for informing your work?

	YES, took part/or obtained	Very useful	Useful	Slightly useful	Not useful
a) Data you personally collect	<input type="radio"/>	1	2	3	4
b) Data schools you work with collect	<input type="radio"/>	1	2	3	4
c) Reports you provide to your Regional Coordinator	<input type="radio"/>	1	2	3	4

g) Working relationships beyond schools**31. How good a working relationship do you have with the following?**

	Excellent relationship	Good relationship	Poor relationship	No relationship yet
a) Enviroschools national office staff	1	2	3	4
b) Other Enviroschools' facilitators in your region	1	2	3	4
c) Your Enviroschools Regional Coordinator	1	2	3	4
d) EfS school advisors in your region	1	2	3	4
e) Mātauranga Taiao facilitators	1	2	3	4
f) NZ Association for Environmental Education (NZAEE)	1	2	3	4
g) NZ UN Decade for Education for Sustainable Development (UNDESD) committee	1	2	3	4
h) Environmental/sustainability NGOs (e.g. Forest and Bird, WWF, Sir Peter Blake Trust, local care groups etc)	1	2	3	4
i) Department of Conservation	1	2	3	4
j) Local businesses	1	2	3	4
k) Established complementary environmental programmes	1	2	3	4
l) Established complementary other programmes in schools e.g. healthy eating, peer support	1	2	3	4

32. What other groups do you have good working relationships with?

h) Enviroschools objectives

33. Below is a list of Enviroschools objectives that have been agreed by the Enviroschools Foundation and the Ministry of Education for 2007–2010. Please rate how well you think these objectives have been achieved so far by the Enviroschools Foundation (Note—the Enviroschools foundation is the national support agency for the Enviroschools Programme).

Objectives	Achieved well	Progress being made	Slow progress being made	No progress being made	Can't comment
a) To raise the level of awareness of, and understanding about, the necessity of education for sustainability (EfS) and what effective EfS incorporates	1	2	3	4	5
b) To have a range of partnerships with different sectors including Local Government, community groups and other EfS programmes	1	2	3	4	5
c) To provide a comprehensive professional development programme for facilitators enabling them to deepen their practice	1	2	3	4	5
d) To enable teachers, both pre-service and in-service, to participate in a range of professional development including Enviroschools hui, site visits, workshops and peer mentoring.	1	2	3	4	5
e) To provide a range of resources to assist schools at different stages of their sustainability journey	1	2	3	4	5
f) To enable students at all levels of schooling to be involved in Enviroschools and develop pathways for continuous EfS for students.	1	2	3	4	5
g) To enable students in kura Māori to be involved in Enviroschools in te reo Māori and from a Māori perspective	1	2	3	4	5
h) To have sustainable school buildings and operations that reflect EfS principles and involve students in the process	1	2	3	4	5
i) To have evaluation data available by Enviroschools participants at all levels reflecting on and monitoring their progress.	1	2	3	4	5

i) Final overview

34. What is the best thing about your work as an Enviroschools facilitator?

35. What are some of the barriers that you face in your work as an Enviroschools facilitator?

36. What are some of the barriers that are hindering the development of EE/EFS in school

37. What is your hope for the future of EE/EFS for schools in your region?

Thank you for your participation



Please return this survey in the freepost envelope provided to:

Chris Eames, CSTER, University of Waikato, Private Bag 3105, Hamilton,

By Monday 26 November, 2007.

Appendix 1B:

Please give this to the person who is responsible for (or most involved in) environmental/sustainability education in your school.



P O Box 3237, Wellington 6000
New Zealand
Education House
178-182 Willis Street
Telephone: +64 4 384 7939
Fax: +64 4 384 7933

Code: []

Dear lead teacher/coordinator of Environmental Education (EE) or Education for Sustainability (EfS),

I would like to invite you to contribute to an important evaluation about professional development in Education for Sustainability (also known as Environmental Education). You are part of a sample of schools that had some form of support from the Enviroschools Programme during 2007–2008. You and/or your colleagues may have, for example, worked with an Enviroschools facilitator in your school, attended a workshop/Hui/Youth Jam organised by the Enviroschools Programme, and/or received an Enviroschools Award.

Our aim is to understand the nature of EfS professional development, to assess and enhance the effectiveness of it, and to feed into the ongoing development of EfS in New Zealand schools and kura. This work has been requested by the Ministry of Education as part of an overall evaluation of Enviroschools, School Support Service EfS Advisory, and Mātauranga Taiao.

We expect that this questionnaire will take 30 minutes to complete. If you're happy to participate, return of your completed questionnaire (post or fax) will be taken as consent to use the information you provide. Your responses will be treated confidentially and your data will be stored securely and reported anonymously.

Data collected from you may be used in writing reports, publications or in presentations, including for the Ministry of Education and Enviroschools—we will not name you or your school. We are required to gain permission from the Ministry of Education for any publication concerning this evaluation.

If you have any questions regarding this study, please contact me at the University of Waikato, Ph 07 838 4357, email c.eames@waikato.ac.nz. For any unresolved issues, please contact Chris Harwood at the Ministry of Education, Ph 04 463 7766, email chris.harwood@minedu.govt.nz.

Completed surveys are eligible to win one of three \$50 book vouchers—to enter the draw please provide contact details on the back of this coversheet. Good luck! We may also be able to send you a summary of the findings.

Thank you for your contribution to this important area. We appreciate your time and thought.

Yours sincerely,

Dr Chris Eames

Complete the survey by ticking bubbles, circling numbers, and writing in boxes.

Please return it by 24 November to Chris Eames
by fax (07 838 4272) or by post in the prepaid envelope
(CSTER, University of Waikato, Private Bag 3105, Hamilton)

Confidential Information

Please put me in the draw to win a \$50 book voucher! (*tick for yes*)

I'd like to be emailed a summary of the findings (*tick for yes*)

If you said YES to either of the above, please complete the following:

Name (please print):

School:

Email:

Address

.....

The winner of the draw will be notified by 25 December 2008

A) Background

Please note: For the purpose of the survey “education for sustainability” (EfS) also covers “environmental education” (EE) or any similar terms that your school may use.

1. Are you currently an EfS leader/coordinator/lead teacher at your school?

¹ Yes - for many years have you been an EfS lead teacher? _____

² No - how you are involved in EfS? _____

2. What is your role in your school?

^a Principal

^b Deputy/Assistant/Associate principal

^c Curriculum/syndicate leader

^d Head of department/faculty

^e Classroom teacher/subject teacher

^f Other, please describe: _____

3. What is your total teaching experience?

¹ Less than 2 years

² 2–5 years

³ 6–10 years

⁴ 11–15 years

⁵ 16 or more years

4. How many years have you been involved in environmental/sustainability education? (Include time at *any* school where you have worked)

¹ Less than 2 years

² 2–5 years

³ 6–10 years

⁴ 11–15 years

⁵ 16 or more years

5. What education/training have you had in EfS?

a) No education/training in EfS

b) Initial teacher training, e.g. undergraduate papers in EfS

c) In-service teacher training, e.g. EfS professional development

d) Relevant postgraduate study, e.g. Masters papers in environmental studies

e) Experience working for an environmental organisation

f) Other, please specify _____

6. Which of the following statements best describes your schools' EfS developments?

- ¹ We are just beginning with EfS
- ² We have been working on EfS for a while, but progress has been slow or inconsistent
- ³ We have been embedding EfS steadily, and have made good progress but still have a long way to go
- ⁴ We consider ourselves to be a leader in the field even though it is an ongoing journey

7. Indicate how strongly you agree or disagree with the following statements for your school:

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) A range of year levels are involved in EfS	1	2	3	4	5
b) Most students are involved in EfS	1	2	3	4	5
c) There is a shared vision for how EfS might develop	1	2	3	4	5
d) EfS is embedded in documents, planning and infrastructure	1	2	3	4	5
e) All staff are encouraged to attend professional development in EfS	1	2	3	4	5
f) Staff discuss EfS in the staff room or in meetings	1	2	3	4	5

8. How many years has your school been doing some form of environmental or sustainability education? (please estimate to the best of your knowledge)

- ¹ Less than 2 years ² 2–5 years ³ 6–10 years ⁴ 11–15 years ⁵ 16 or more years

9. For how many years has the school (at least one teacher) had support from EfS providers? (e.g. Enviroschools, DOC, WWF, regional council, Royal Society). If you have had a combination of support, circle more than one line.

	Less than 1 year	1–2 years	3–4 years	5 or more years	Don't know	No support
a) Enviroschools	1	2	3	4	5	6
b) School Support Service EfS advisor(s)	1	2	3	4	5	6
c) Other environmental/sustainability providers/programmes, please list below:						
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	

10. Please indicate how strongly you agree with the following statements about your experience with two providers: Enviroschools AND EfS School Support Services EfS advisors.

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) We have had better access to one provider than the other	1	2	3	4	5
b) Each provider offers different strengths (or one is better matched to our needs)	1	2	3	4	5
c) The two providers appear to work well together	1	2	3	4	5

11. How useful have you found the following for developing EfS in your school/teaching?

	Very useful	Useful	Slightly useful	Not useful	Not used
a) Enviroschools kit	1	2	3	4	5
b) Enviroschools Handbook	1	2	3	4	5
c) Environmental Education Guidelines (1999)	1	2	3	4	5
d) The new NZ Curriculum (2007)	1	2	3	4	5
e) EfS website (now part of TKI)	1	2	3	4	5
f) Resources from other organisations (e.g. DOC, councils, businesses)	1	2	3	4	5

B) Support from: Enviroschools Programme

This section is ONLY about the Enviroschools Programme and its facilitators.

Please do not consider support you have had from other EfS providers.

12. Over the past two years, what proportion of the teaching staff has had some form of professional development through Enviroschools? *[tick one only]*

¹ One teacher

² Some teachers

³ All teachers

13. Which other people in the school received direct support from Enviroschools?

^a School leaders (principal/managers)

^b Caretaker

^c Board of Trustees

^d Students

^e Others, please describe: _____

14. Please indicate which kinds of Enviroschools professional development YOU have personally experienced and how useful you found each one?

	Very useful	Useful	Slightly useful	Not useful	Not used
a) Individual one-on-one PD/support for you	1	2	3	4	5
b) PD for your school, attended by several staff from within your school	1	2	3	4	5
c) PD for your region/cluster, attended by staff from a range of schools	1	2	3	4	5
d) Attendance at an Enviroschools Hui or Youth Jam	1	2	3	4	5
e) Please describe and rate any other Enviroschools professional development:	1	2	3	4	5

15. Please give an assessment of the Enviroschools facilitator who most recently worked with you or your school?

The facilitator...	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) demonstrated good facilitation skills	1	2	3	4	5
b) was well organised and professional	1	2	3	4	5
c) was available when I needed them (during and after session/s)	1	2	3	4	5
d) was collaborative, encouraging two-way learning between advisor and teachers	1	2	3	4	5
e) demonstrated a good understanding of environmental issues and sustainability	1	2	3	4	5
f) demonstrated a good understanding of the national/school curriculum	1	2	3	4	5
g) demonstrated a good understanding of how schools work	1	2	3	4	5
h) demonstrated a good understanding of effective teaching and learning	1	2	3	4	5

16. a) Please give an overall assessment of all the Enviroschools professional development you have been part of:

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) It has been an enjoyable learning process	1	2	3	4	5
b) It challenged my thinking	1	2	3	4	5
c) It was practical	1	2	3	4	5
d) It modelled how I might work with my students	1	2	3	4	5
e) It informed me of people or groups that might offer EfS help	1	2	3	4	5
f) It informed me of relevant physical/web-based resources	1	2	3	4	5
g) It led me to reflect on the purpose, nature, or structure of schools/education	1	2	3	4	5
h) It led me to incorporate more environmental/sustainability content into my lessons	1	2	3	4	5
i) It led me to make changes to my teaching style	1	2	3	4	5

- b) If you disagreed with any of these, please note the item (a - i) you most strongly disagree with and explain why you disagree:

- c) For any answer you gave to (b), what do you think could be done to improve the situation?

17. Has support from Enviroschools facilitators helped develop EfS in the school in any of the following ways? [If yes, tick all that apply]

- g) As an extra/co-curricular activity or group
- h) As a separate interdisciplinary EfS course, subject, or module
- i) As an integrated theme across syndicate or school
- j) Included in all learning areas
- k) Included in one or more (but not all) learning areas—if so, tick which ones below:

- ^g English or languages
- ^h Mathematics
- ⁱ Science
- ^j Technology
- ^k Social Sciences
- ^l The Arts
- ^m Health and physical wellbeing
- ⁿ Other, please describe _____

18. Please indicate how strongly you agree or disagree with each of the following:

Being involved in professional development with the EnviroSchools Programme and its facilitators has helped me to better understand...	Strongly agree	Agree	Disagree	Strongly disagree
a) The general purpose and principles of EfS	1	2	3	4
b) The role of EnviroSchools facilitators	1	2	3	4
c) The role of other EfS providers, e.g. School Support Services EfS advisors	1	2	3	4
d) NZ's Environmental Education Guidelines (1999)	1	2	3	4
e) Environmental aspects of sustainability	1	2	3	4
f) Socio-cultural aspects of sustainability	1	2	3	4
g) Economic aspects of sustainability	1	2	3	4
h) Interdependence of environmental, social, cultural, political, and economic aspects	1	2	3	4
i) [Western] Scientific environmental knowledge	1	2	3	4
j) Māori environmental knowledge	1	2	3	4
k) Relationships between Māori and Western knowledge (inc. similarities/differences)	1	2	3	4
l) How EfS relates to the front end of the NZ curriculum(i.e. vision, principles, key competencies, future focussed issues)	1	2	3	4
m) How to run a specific EfS project or unit	1	2	3	4
n) Teaching and learning approaches suited to EfS	1	2	3	4
o) How to support students to make decisions on what and how to learn	1	2	3	4
p) How to support student-planned action(s)	1	2	3	4
q) How my school can become environmentally sustainable	1	2	3	4
r) How I can personally become more environmentally sustainable	1	2	3	4
s) How to document students' learning in EfS	1	2	3	4
t) How to assess students' EfS learning/achievement	1	2	3	4
u) How to monitor progress towards becoming a sustainable school	1	2	3	4

C) Impacts on teaching and the school

19. To what extent do you think support from Enviroschools facilitators has impacted on the following potential changes in your school? (This could be from them directly helping you to do it, or from initially doing PD with a facilitator, then going your own way or becoming inspired to try something else).

	Strong positive impact	Some positive impact	No impact	Negative impact	Don't know
a) Included or strengthened EfS in high-level documents (e.g. school vision, strategic plan, or curriculum plans)	1	2	3	4	5
b) Increasing environmental/sustainability content in the school curriculum	1	2	3	4	5
c) Providing more EfS learning opportunities/programmes for students	1	2	3	4	5
d) Designing units/projects around the unique needs/location of the school	1	2	3	4	5
e) Enabling more student-centred learning and facilitative teaching approaches	1	2	3	4	5
f) Getting more staff interested and involved in EfS	1	2	3	4	5
g) Strengthening school leadership support and vision for EfS	1	2	3	4	5
h) Developing more participatory school decision-making processes	1	2	3	4	5
i) Building more collaboration between teachers	1	2	3	4	5
j) Developing relationships with EfS providers/environmental organisations	1	2	3	4	5
k) Developing relationships with local iwi/hapu/marae	1	2	3	4	5
l) Developing relationships with other community members/groups	1	2	3	4	5
m) Collaborating with other schools on EfS or local sustainability initiatives	1	2	3	4	5
n) Reorienting school structures to provide opportunities for EfS (e.g. timetables)	1	2	3	4	5
o) Improving the school's sustainability practices (e.g. recycling, carbon neutrality)	1	2	3	4	5
p) Improving the school's natural environment (e.g. planting in school grounds)	1	2	3	4	5
q) Reflecting on data to refine approaches to EfS (at a teacher or school level)	1	2	3	4	5
r) Assessing student learning in EfS	1	2	3	4	5
s) Providing more relevant and authentic learning experiences for students	1	2	3	4	5

20. Please describe the main difference(s) you have made to your teaching as a result of Enviroschools professional development:

21. Outside of teaching, please describe the main change(s) that has happened at the school as a result of Enviroschools professional development:

D) Student outcomes

What do students experience and achieve through EfS in your school

Think of one 2008 unit of work or learning experience your students were (or are) involved in that exemplifies your approach to EfS (e.g. it may be a specific project/unit, an extracurricular activity, or an integrated theme). Please answer this page in relation to this learning experience.

22. Which year level(s) were/are the students? (tick all that apply)

^aYear 0–3

^bYear 4–6

^cYear 7–8

^dYear 9–10

^eYear 11–13

23. Please briefly describe the class, activity, project, or unit of work:

24. Please indicate how strongly you agree or disagree with the following statements about students' learning outcomes.

Through this project/activity/unit, I believe students...	Strongly agree	Agree	Disagree	Strongly disagree
a) Developed their understanding about the biophysical environment	1	2	3	4
b) Questioned and researched about a specific environmental issue or strategy	1	2	3	4
c) Questioned and learned about big picture sustainability themes like social justice, ecological sustainability, cultural diversity, wealth distribution, globalisation	1	2	3	4
d) Developed an understanding of relationships between local, national, and global sustainability	1	2	3	4
e) Built up a picture of a complex phenomenon and change processes	1	2	3	4
f) Felt overwhelmed and disempowered about sustainability issues	1	2	3	4
g) Made key decisions about what to study or how to undertake actions	1	2	3	4
h) Developed their critical thinking skills	1	2	3	4
i) Clarified their ethics and values in relation to sustainability	1	2	3	4
j) Drew on, or developed their understanding of, Māori concepts	1	2	3	4
k) Reflected on their personal understandings of sustainability	1	2	3	4
l) Imagined the future	1	2	3	4
m) Worked with environmentally focussed partners (e.g. local government, iwi, sustainable business, NGOs)	1	2	3	4
n) Took action for sustainability (e.g. addressed an environmental issue)	1	2	3	4
o) Used a variety of knowledge systems or disciplines to understand a sustainability issue (e.g. science, health, Māori knowledge, etc)	1	2	3	4
p) Increased their engagement, interest, or motivation in learning	1	2	3	4
q) Changed their lifestyle or practices outside of school as a result (see below)	1	2	3	4

25. If you agreed with item (q) above: What changes have your students made in their lives that you have noticed or heard about (e.g. in their family, out of class, etc)?

26. Environmental Education Guidelines (1999) have the following 5 aims for students. Please rate how well your students have developed each through EfS opportunities at your school.

	<i>A lot better</i>	<i>A little better</i>	<i>No different</i>
a) Awareness and sensitivity to the environment and related issues	1	2	3
b) Knowledge and understanding of the environment and the impact of people on it	1	2	3
c) Attitudes and values that reflect feelings of concern for the environment	1	2	3
d) Skills involved in identifying, investigating and problem-solving associated with environmental issues	1	2	3
e) A sense of responsibility though participation and action as individuals or members of groups, whānau or iwi in addressing environmental issues.	1	2	3

E) EfS and education directions

27. Please rate your dis/agreement with the following items about the relationship between EfS and the recent New Zealand Curriculum (2008)

	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>	<i>Don't know</i>
a) The NZ curriculum gives a strong mandate for EfS	1	2	3	4	5
b) EfS provides a means to meet the intentions of the new NZ curriculum	1	2	3	4	5
c) EfS supports students to develop the Key Competencies	1	2	3	4	5
d) EfS is relevant to the Essence Statements and Achievement Objectives of the Learning Areas I teach	1	2	3	4	5
e) EfS prepares students to contribute to NZ's social and economic development	1	2	3	4	5
f) EfS encourages effective teaching (e.g. reflective practice, teacher inquiry)	1	2	3	4	5
g) EfS is vital for today's society and future generations	1	2	3	4	5
h) MOE needs to give stronger mandate for EfS	1	2	3	4	5

28. Please rate your dis/agreement with the following items about Māori learners' experiences with EfS, in relation to Ka Hikitia (2008) outcomes.

EfS at this school helps Māori learners to...	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) Excel educationally (e.g. achieve their learning goals)	1	2	3	4	5
b) Realise their cultural distinctiveness and potential as Māori	1	2	3	4	5
c) Participate and contribute in ways important to their communities	1	2	3	4	5
d) Bring their own cultural knowledge to EfS	1	2	3	4	5
e) Extend their cultural knowledge through EfS	1	2	3	4	5
f) Negotiate relationships between Māori knowledge and other knowledge	1	2	3	4	5
g) Use te reo Māori	1	2	3	4	5

F) Supports and barriers to EfS development

29. Please rate how well each of the following support EfS development in your school:

	Very good	Good	Poor	Very Poor
a) Leadership support for EfS (e.g. from principal and senior managers)	1	2	3	4
b) Teachers and other staff support for EfS	1	2	3	4
c) Parental support for EfS	1	2	3	4
d) Wider community (including local groups or organisations) support for EfS	1	2	3	4
e) Teacher retention (e.g. EfS-inspired teachers staying at the school)	1	2	3	4
f) Funding available for EfS work	1	2	3	4
g) Time available for EfS work	1	2	3	4
h) Access to EfS information and/or resource materials	1	2	3	4
i) Access to professional development	1	2	3	4
j) Access to relevant community partners	1	2	3	4
k) Government policy	1	2	3	4

30. What barriers (if any) have prevented your school from further developing EfS?

31. What more could the Enviroschools Programme do to help you move EfS forward? How could the service improve?

32. What else, outside the control of the Enviroschools Programme, could be done to support EfS? And/or in what other ways would you like to receive EfS professional development?

33. Is there anything else you want to say that might help us to evaluate EfS professional development and EfS outcomes in schools?

Thank you for your help! Please return the survey by 24 November!

Part Three:

Report on National Education for Sustainability advisory team in School Support Services

Josie Roberts and Rosemary Hipkins

Preliminary Note

Part Three of this report concentrates on the provision of a report on National Education for Sustainability. Part One provides an overview of the main findings for each initiative and examines what each contributes to EfS in New Zealand. The other evaluation findings for each initiative appear in Parts Two and Four.

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1. Introduction

The Evaluation of Education for Sustainability (EfS), funded by the Ministry of Education, involves three initiatives: the National EfS team within School Support Services, the Enviroschools programme and Mātauranga Taiao.

This report focuses on the first of these initiatives—the work of the National EfS Advisory team within School Support Services. It evaluates the aims, processes and outcomes of the School Support Services National EfS team (NEfS) initiative, by answering a series of evaluation questions and drawing on an analytic framework in relation to the NEfS initiative specifically. This report provides evaluative evidence, analysis and informed commentary to:

- inform the ongoing work of the NEfS initiative
- provide a detailed backdrop to the overview evaluation report that looks across all three EfS initiatives (Eames, Roberts, Cooper & Hipkins, in press).

A national EfS team within School Support Services

School-based education for sustainability, together with its associated professional development, grew in response to national and international attention to environmental issues in the 1960s and 1970s. A series of international meetings focused on the need for environmental education as a key strategy for taking action to address environmental problems. Growing realisation of the inseparability of environmental problems from human endeavour led to a re-orientation of thinking towards sustainable development at the Rio Earth Summit in 1992 (UNCED, 1992). National interest in environmental sustainability and education culminated in two key government documents in the late 1990s: *Learning to Care for Our Environment: Me Ako ki te Tiaki Taiao* (Ministry for the Environment, 1998); and *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999). As EfS is a relatively young field in the formal curriculum, so too are the EfS advisors a relatively new team within the work programme of School Support Services.

The School Support Services EfS team grew out of an initial contract to pilot professional development to assist schools with the implementation of the *Guidelines for Environmental Education in New Zealand Schools*. Today, there are six School Support Services in New Zealand, each of which employs at least one EfS adviser.¹ The primary focus of the six organisations is professional development for schools, with a focus on supporting professional learning communities within and between schools. Each School Support Service is responsible for carrying out the work outlined in a Regional Output Schedule for EfS within the Ministry of Education Teaching Support Services contract. Each School Support Service provides milestone reports to the Ministry of Education about progress on their Teaching Support Service contract, of which EfS milestones are one component.

Each EfS adviser is also a member of the NEfS team, which is led by two co-coordinators (one of whom is also a regional adviser). The national coordinators are responsible for the work under another Output Schedule, which is focused on building the capacity of EfS nationally, including professional development for all regional advisors themselves. One of the six School Support Services managers is a nominated management representative for this work. The coordinators present their milestone reports to a NEfS Reference Group, contracted by the Ministry of Education to provide reflection and advice for the NEfS team. As at late 2007 there were 21 EfS advisors in total, approximately half being part-time in their EfS role.

¹ This report uses the term EfS advisors, but they are also called NEfS advisors, EfS regional co-ordinators or EfS facilitators.

The expected outcomes of the work of the regional advisors, and the full national team, are discussed in later sections of the report.

Report structure

The report is organised by the evaluation questions outlined the next chapter on evaluation methodology. Chapter 3 evaluates the alignment between NEfS advisory service and broad EfS goals. We consider the effectiveness of the relationships and processes of the initiative through the perspectives of the EfS advisors in Chapter 4 and school staff in Chapter 5. In Chapter 6 we examine the impacts that the EfS advisors have had on schools and teachers, and the consequences for student learning are presented in Chapter 7. We draw the evidence together in relation to NEfS contractual expectations in Chapter 8 and outline implications for future EfS developments in the final chapter.

2. Methodology

It is common for evaluators to develop a logic model to represent the expected sequential relationships between a programme's intended inputs, outputs and outcomes, from the immediate, to the medium term, and on to the longer term (Duignan, 2004; Monroe & Fleming, 2005; Rogers, & Huebner, 2000). One criticism of this approach is that it represents a linear and mechanistic view of the world, one that could be seen to contrast quite sharply with the ecological systems approach that underpins EfS (Sterling, 2001). A logic model assumes that outcomes can be predicted and defined ahead of time, and that everyone within a programme or change-system should be heading towards the same destination. In fact this is often not the case in innovative developments nor in complex systems where outcomes have an emergent quality that cannot be fully predicted in advance (Patton, 2008). Table 1 provides a brief illustrative summary of key differences between these two approaches. Ecological models highlight the importance of visions, values, principles and processes (rather than looking to find replicable models and measurable final outcomes), as well as the interconnectedness of whole systems (rather than focusing on discrete steps or parts).

Table 1: The focus in two different change models

Ecological systems model	Linear logic model
Visions for an uncertain future	Blueprints for change
Foregrounds principles and processes for change	Foregrounds expected outcomes of change
Change is continuous and emergent	Change occurs in steps and stages
Interconnected whole	Discrete parts
Complex systems	Systems can be simple or complicated
Assumes principles emerge from—and adapt in—local contexts	Assumes that models can be perfected and replicated across contexts

In this evaluation we attempted to bring together these two approaches. We are aware that different representations of change processes have implications for how evaluators might go about understanding whether an initiative is meeting specific objectives and big-picture aims. For example, there are at least three ways to judge whether EfS outcomes are being achieved. We could ascertain whether and to what extent (and possibly how, for whom and within which contexts):

- EfS principles are expressed in different ways throughout schools and the education system as the “modus operandi” of all participants
- predetermined steps of change have occurred as the flow-on effects from EfS professional development (ie, there is attributable transference from EfS advisors to teachers/schools to student outcomes)
- there is an improvement in the future state of the education system and the health of our planet and its communities in, for example, 20 years time.

We have used a combination of the first two methods for making judgements in this evaluation (“principles” and “steps”), while keeping our eye on the third (“futures”). In practice this means that we evaluate the extent to which we believe key EfS principles are evident in school, teacher and student outcomes.

In order to successfully juggle these different methods of judgement, with their different underpinning assumptions, we developed an analytic framework which is discussed shortly. This framework was informed by the evaluation team's understanding of principles and visions for school-based EfS, as discussed in the research literature, as well as our previous research on environmental/sustainability education and other education developments. A set of evaluation

questions, negotiated between the evaluation team and the Ministry of Education (with minimal input from any EfS initiative), informed our evaluation design and the structure of this report.

Evaluation questions

The questions that guided the overall evaluation of the three initiatives were²:

1. What are the key messages, goals and intended outcomes of school-based EfS and how does each initiative align with these?
 - a) What key motivations and developments have informed and supported the initiation and growth of these initiatives?
 - b) How do the goals and intended outcomes of each initiative align with or extend internationally-promoted and New Zealand governmental “Key Messages” for EfS in schools, and specifically New Zealand/Māori conceptions of sustainability?
 - c) How have the goals and intended outcomes of each initiative aligned with or extended the “aims for Environmental Education” outlined in the *Guidelines for Environmental Education in New Zealand Schools* and other government guiding documents in school-based environmental education?
2. How effective are the three initiatives in “operationalising” EfS key messages and achieving EfS goals in schools?
 - a) To what extent do the initiatives individually contribute to the achievement of EfS goals?
 - b) How do the three initiatives work together and complement each other to achieve EfS goals?
 - c) What and how do contexts, processes and practices support the achievement of EfS outcomes within each initiative?
 - d) To what extent do the EfS initiatives impact on: students’ learning opportunities, understanding and assessment of student learning outcomes in EfS; teaching practices, including pedagogical change; school-wide structures and curriculum development; and community partnerships and sustainability?
 - e) To what extent do the initiatives achieve outcomes suggested by wider literature and conceptions of EfS (in comparison with Environmental Education)?
 - f) To what extent have the initiatives achieved the goals and outcomes set out in their service agreements with the Ministry of Education?
3. What are the future directions for school-based EfS in relation to current and potential goals?
 - a) What are the key areas that require further development within each of the initiatives?
 - b) What could the Ministry of Education do to support the ongoing development of EfS in the New Zealand context?

We conducted the evaluation in two phases.

Phase One

The first phase of the evaluation (August 2007–March 2008) focused on understanding the background and intended outcomes of the initiative, how EfS advisors understood and carried out their work, how they assessed the impact of that

² The order of the subquestions in this report differs from the order in the overview report (Eames, et al., in press).

work, and barriers and opportunities associated with achieving their outcomes. In the first year of the evaluation we gathered data through individual and focus group interviews, a survey and document analysis. These comprised:

- one focus group with five EfS advisors
- four individual EfS advisor interviews
- two NEfS national co-coordinator individual interviews
- three School Support Service manager interviews
- twenty completed EfS advisor surveys.

We selected EfS advisors to take part in interviews and/or focus groups to include a range in terms of their: length of service, region, primary/secondary and the NEfS working groups of which they were part. School Support Services managers were selected on the basis of: wider involvement in NEfS, size of their EfS team and their region. Interview schedules were developed on the basis of the evaluation questions, analytic framework and an initial planning meeting with the NEfS co-coordinators. The focus group took place at the October 2007 National EfS Hui, and the individual interview schedules were reviewed as a result. Each interview covered: history and aims; structures, processes and relationships; perceived effectiveness, supports and challenges; and reporting and future directions. The evaluator took detailed notes during the interviews and then reviewed these with the aid of an audio-recording. Where requested, the transcript was sent to participants for verification or alteration.³

The adviser surveys were mailed to all EfS advisors, and a response rate of 95 percent was achieved. The survey contained both open and closed questions (see Appendix A), and covered the following areas:

- employment position and background
- conceptions and purpose of advisory work
- supports and resources
- advisory practices and processes
- effectiveness and impacts
- data collection and reporting
- relationships
- challenges and future directions.

Data from closed responses were captured by NZCER's Statistical Data Management team, who provided initial analysis of quantitative patterns. Open responses were data entered by the same team but here the content was analysed by the evaluator. Six advisors who were only employed during 2007 (when they also completed the survey) tended not to answer many of the impact questions.

We also interviewed, individually or in a focus group, a number of other representatives of key organisations that have an interest in EfS. These included the Department of Conservation, the New Zealand Association for Environmental Education, the Royal Society, the Greater Wellington Regional Council, WWF New Zealand and the Sustainable Business Network (the Ministry for the Environment declined to participate).

³ Three requested this option.

Our document analysis took into account the two School Support Services output schedules for national and regional EfS work (2007 and 2008), the EfS National Coordination Team Strategy 2006–2008 and the NEfS Draft Annual Plan 2007.

We produced a Phase One interim report⁴ for the Ministry of Education and the NEfS team to describe the development, key emphases and operational practices of the NEfS team, as well as the advisors' perceptions about their effectiveness. The early timing of this interim report meant that the material we were able to present was largely descriptive and did not fully answer the evaluation questions (especially Questions 2 and 3). This report addresses the gaps in the interim report as well as building on the initial findings.

Phase Two

The second phase of the evaluation (April 2008–March 2009) focused on seeking to understand the impact that the NEfS team has had for schools, communities and student learning outcomes, and the contexts that enable or hinder such outcomes. In this second phase we gathered data from members of school communities through surveys, interviews, document analysis and case studies. This involved:

- a survey for a national sample of EfS lead teachers
- two case studies with multiple interviewees—one at a primary school and one at a secondary school
- two sole interviews with a key staff member at another primary and another secondary school
- analysis of documents relevant to EfS as provided by interviewees.

Developing the lead teacher survey

The survey asked EfS lead teachers to respond to questions about their own, their school's and their students' experiences and outcomes in relation to support from EfS advisors.

The NEfS team is essentially a professional development team and so we drew on the work of a leading international professional development evaluator, Thomas Guskey (2000, 2002) when designing the survey questions. He suggests there are five stages between professional development input, teacher outputs and student outcomes that can be examined as follows:

- Teachers' reactions. (Did they like it? Did it make sense? Did they find it useful?)
- Teachers' learning. (What did they learn?)
- Organisation support and change. (Were teachers' supported to make change? Was there decent resourcing?)
- Teachers' use of new knowledge and skills. (Did it make a difference to their practice?)
- Student learning outcomes. (Did it benefit students? How?)

Guskey makes the point that for professional development advisors to do a good job they need to be clear about the student outcomes they are aiming to achieve, and work *backwards* from there to design suitable professional development. He suggests that evaluators need to work *forwards* from teachers' initial reactions to understand the impact of professional development, because if student outcomes are less than ideal it is useful to know which step in the chain is letting them down. While helpful to our design thinking, the logic of this approach does not sit entirely well with complex systems thinking, nor with a focus on professional learning *communities* rather than on individuals.

⁴ Unpublished report provided to the Ministry of Education in March 2008, and later circulated to the NEfS co-coordinators then the full advisory team.

Consequently, our survey design was also informed by wider EfS and professional learning literature, as well as documentation and analysis from the first phase of the evaluation.

The questionnaire was divided into six areas:

- background on the teacher's role and the school's involvement in EfS
- the nature and usefulness of the support they/the school received from EfS advisors
- the impact of this support on teaching and the school
- student outcomes achieved through EfS
- the match between EfS and education directions for New Zealand
- support and barriers to EfS development.

Survey respondents

The NEfS database shows that EfS advisors had worked with nearly 300 schools in 2007 and/or 2008. Of these, 180 schools were also on the Enviroschools database. Because the Enviroschools initiative was also being evaluated we divided the "in common" schools into two randomised groups so that half (90 schools) were available for the NEfS survey. To these 90 schools we added the remaining 110 schools that had received NEfS support but had not been Enviroschools. We removed three kura kaupapa Māori/wharekura as they may have begun work with the Mātauranga Taiao initiative. As a result we were able to send out the NEfS survey to a final sample of 206 schools. The survey was addressed to the EfS lead teacher and they were asked to respond in relation to support from NEfS. One hundred and five schools returned a completed survey (two of which arrived after our data capture deadline). This gave an adequate response rate of 51 percent.

- Seventy-two percent of completed surveys came from primary or intermediate schools and 28 percent from secondary schools, which very closely matches the overall proportions in the NEfS database.
- Three-quarters (76 percent) of the surveys were completed by a designated EfS lead teacher (about half had held this role for less than two years) while another staff member completed the remainder. Two-thirds (66 percent) of respondents were classroom teachers; the remainder being senior managers such as principals and department/curriculum leaders.
- Just over half the respondents had at least 10 years' teaching experience, but only 10 percent had been personally involved in some form of environmental/sustainability education for over 10 years (34 percent had less than two years' EfS experience and 44 percent had two to five years' experience).

When checking other responses against school size we found some relationships that will be discussed later in the report. As a context for these findings, Table 2 shows that respondents were evenly spread across all except the very biggest schools. As might be expected the primary schools tended to the smaller end of the scale and the secondary schools to the larger end.

Table 2: Size of schools in the achieved survey sample

Roll numbers	1–100	100–299	300–499	500–999	> 1,000
Primary	27	21	17	8	0
Secondary	0	1	5	15	7
Total	27	22	22	23	7

Note that 15 of the 17 principals who responded as the “lead EfS teacher” were in schools with rolls of fewer than 100 students.

The school case studies and interviews

Two case study schools, one primary and one secondary, were selected from the NEfS database. Table 3 shows that these case study schools differed in a wide range of characteristics likely to be pertinent to the evaluation. Obviously two schools cannot be considered representative, but they did provide an important insight into EfS developments within a given context and helped us to gain a deeper understanding of some of the quantitative survey patterns. We also interviewed one staff member from two other schools that we were unable to include as full case studies.

For the case studies, we designed several interview schedules tailored to different roles in the school (eg, principal, student, EfS lead teacher). Each interview covered: background and purposes; practices and outcomes; and strengths and challenges. The questions were used flexibly to build up a rich contextualised picture of the EfS advisors’ relationships with the school, and its impact on the development and outcomes of EfS in the school. Interviewees were also asked to provide any documentation relevant to the evaluation, or to illustrate areas of discussion (eg, school vision statements, curriculum and unit plans or examples of student work). Each interview or focus group lasted up to one hour. The interviewer, Josie Roberts, took detailed notes and later returned to the digital voice recordings to fill gaps of interest.

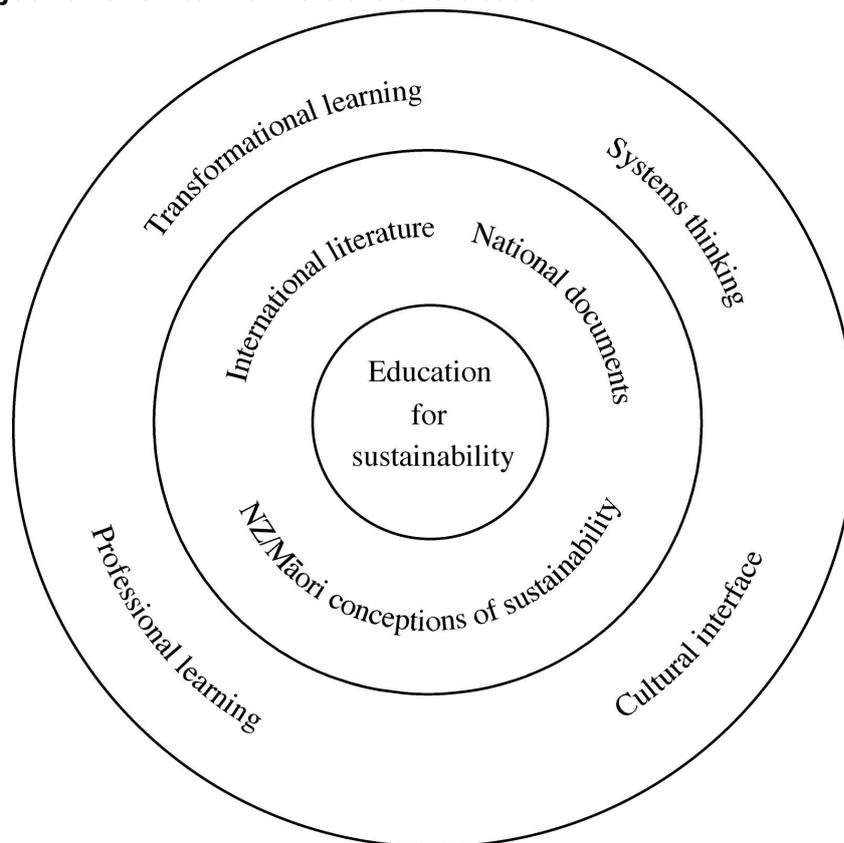
Table 3: Characteristics of the case study schools

	School details	Method
Case Study Two: Secondary School	Large city Decile 5 Enviroschool (awards programme) Multicultural with Māori bilingual unit	Individual interviews with: <ul style="list-style-type: none"> • deputy principal • executive officer • caretaker • EfS lead teacher • 3 other teachers Focus groups with: <ul style="list-style-type: none"> • 2 students (Y12 and Y13) • 3 students (Y10)
Case Study One: Full Primary School	Small village Decile 10 Enviroschool (facilitated programme) Predominantly Pākehā	Individual interviews with: <ul style="list-style-type: none"> • principal • EfS lead teacher • another teacher Focus groups with: <ul style="list-style-type: none"> • 5 students (Years 3 to 6) • 2 parents
Sole Interview One: Contributing Primary School	Medium town Decile 9 Enviroschool (only recently facilitated)	Individual interview with: <ul style="list-style-type: none"> • principal
Sole Interview Two: Secondary School	Medium town Decile 8 Enviroschool (non-facilitated)	Individual interview with: <ul style="list-style-type: none"> • EfS lead teacher

Analysis

We developed an analytic framework to inform the design of the evaluation instruments and overall synthesis of findings. The framework directed our focus towards national and international thinking about EfS, the nature of the initiatives as professional development programmes (as suggested by their contracts with the Ministry of Education) and the unique New Zealand context. It also encouraged us to pay particular attention to transformational learning, systems thinking, cultural interfaces and professional learning, as well as considering the interconnections between them (within NEfS itself as discussed in this report, and across all three initiatives as a fuller EfS system as discussed in our overview report).

Figure 1: An analytic framework to inform the overall evaluation



The elements to which we paid particular attention within each of the four outer areas are set out in Table 4. We note a degree of overlap between them, where some elements in the second column could also be associated with at least two of the broad areas in the first column. These summarise what we saw as important intentions of school-based EfS, as expressed in national and international literature. These intentions are described in more detail in the next chapter, in relation to EfS generally and the NEfS initiative specifically.

Table 4: Expanding on the four broad areas of the analytic framework

Broad area	Elements (principles/outcomes)
Transformational learning—learning that leads to thinking, acting and being that fosters sustainability; emphasising that EfS is about change both in educational and sustainable practices	<ul style="list-style-type: none"> • Facilitative teaching • Student-centred learning • Participatory action taking • Critical thinking and reflection • Clarifying values, ethics and assumptions • Change towards sustainable practice
Systems thinking—emphasising the holistic and interconnected nature of EfS and a deep reflection on the underlying causes of problems and development of solutions	<ul style="list-style-type: none"> • Whole-school/systems approach • Democratic decision-making • Strong school–community links • Interconnectedness of people and the environment • Integrating curriculum
Cultural interface—emphasising the interrelationships between cultures in New Zealand, especially between Western culture and Māori culture, and the dynamic spaces between different cultural ways of knowing/being/doing	<ul style="list-style-type: none"> • Honouring the Treaty of Waitangi • Recognising multiple worldviews • Negotiating between worldviews • Creating shared language • Tracing genealogies of knowledges
Professional development—emphasising the focus of the three initiatives on a professional development process to develop EfS learning communities	<ul style="list-style-type: none"> • Shared visions • Reflective conversations • Sharing of practice • Joint planning and curriculum development • Distributed leadership • Support for changing practice

In the next five chapters the evaluation findings are presented under the relevant evaluation questions, tailored as necessary to refer specifically to the NEfS initiative.

3. Intentions of Education for Sustainability

In this chapter we use the three background dimensions of our analytic framework to address our first evaluation question. As shown in Figure 1, these are: international literature; national documentation; and New Zealand/Māori conceptions of sustainability. Our aim is to better understand the intentions of EfS in New Zealand, so that we have a way to understand what is important to consider for the evaluation.

The first overall evaluation question required some adaptation in order to be most useful for addressing the specifics of the NEfS initiative in particular. Table 5 shows how this was done, with three subquestions developed to provide greater clarity and focus for the discussion of findings.

Table 5: How Q1 was adapted for the NEfS initiative in particular

Main evaluation question (Q1)	Question and subquestions adapted to NEfS (Q1)
What are the key messages, goals and intended outcomes of school-based EfS, and how does each initiative align with these?	What are the intentions (key messages, goals and intended outcomes) of school-based EfS according to: international thinking and commitments; national documentation; and NEfS documents and interviews?
Main evaluation subquestions (Q1a, b, c)	How do the NEfS intentions align with, further clarify or sit in tension with these broader intentions of school-based EfS, with special attention to:
(a) What key motivations and developments have informed and supported the initiation and growth of each EfS initiative?	<ul style="list-style-type: none"> the key motivations and developments that have informed and supported the initiation and growth of NEfS (aligns with subquestion (a))
(b) How do the goals and intended outcomes of each EfS initiative align with or extend internationally-promoted and New Zealand governmental “Key Messages” for EfS in schools, and specifically New Zealand/Māori conceptions of sustainability?	<ul style="list-style-type: none"> internationally-promoted conceptions of EfS in schools (aligns with subquestion (c)) New Zealand and Māori conceptions of EfS/sustainability (aligns with subquestion (b))
(c) How have the goals and intended outcomes of each EfS initiative aligned with or extended the “aims for Environmental Education” outlined in the <i>Guidelines for Environmental Education in New Zealand Schools</i> and other government guiding documents in school-based environmental education?	<ul style="list-style-type: none"> government/education conceptions of EfS, particularly the EfS outcomes expressed in: the Key Messages for EfS in schools; the <i>Guidelines for Environmental Education in New Zealand Schools</i>; and <i>The New Zealand Curriculum</i> (aligns with subquestion (c)).

School-based EfS: Key messages, goals and intended outcomes

NEfS appears to be accountable to a range of outcomes from a range of places. In order to understand the key messages, goals and intended outcomes of school-based EfS we needed to speak to a range of people and to look across a range of documents. We begin the discussion by laying out what we see as the key intentions⁵ of EfS as we have seen these expressed in international literature, key New Zealand documents and NEfS material and interviews.⁶ We then analyse the tensions that could arise from differences in expectations and examine how these impact on NEfS in development, in theory, on paper and in practice.

International EfS intentions

Internationally, EfS outcomes are expressed through theoretical literature, practical resources and a number of international commitments. Current international thinking regarding EfS in schools emphasises transformational systems thinking (Jickling & Wals, 2007; Sterling, 2001), whole-school approaches (Malone & Tranter, 2003; Tilbury

⁵ We use the word “intentions” as shorthand for key messages, goals and intended outcomes.

⁶ Please note that this ordering from the international to the local is somewhat of an antithesis of the ground-up approach important to EfS.

& Wortman, 2005), cultural inclusiveness (UNESCO, 2007) and participatory action taking (Blanchet-Cohen, 2006; Jensen, 2002). Transformational, systems thinking looks towards interrelationships between complex systems that might support a sustainable future. It also recognises the role that critical thinking plays in coming to understand the underlying reasons for our current relationship with the environment. Whole-school approaches emphasise the need to engage the whole community in EfS and to participate democratically in education that empowers learners. Cultural inclusiveness promotes the incorporation of indigenous ways of knowing and doing in EfS and recognises the interconnectedness of the world's peoples. Participatory action taking suggests that education must lead to an ability to act with knowledge and intention, to develop what is known as action competence, with reference to the environment and a sustainable future.

International concerns about global sustainability have led to the development of several international treaties and protocols for sustainability and the role of education. New Zealand is a signatory to many of these, including:

- The Kyoto Protocol, which commits New Zealand to reducing carbon emissions
- Agenda 21 (UNCED, 1992) which called for education for sustainable development in schools, and was updated at the Johannesburg World Summit Rio+10
- The Decade of Education for Sustainable Development 2005–2014 (UNESCO, 2007), which promotes interdisciplinary and values-based learning, critical thinking, participatory decision-making and locally relevant actions.

National EfS intentions: Government perspectives

A uniquely New Zealand approach to EfS is expected to honour the Treaty of Waitangi and support inclusion and self-determination of Māori knowledge, to respect other cultures and focus on local and regional approaches to sustainability. Two government ministries and a commission have set out their expected outcomes from EfS in New Zealand: the Ministry of Education; Ministry for the Environment; and the Parliamentary Commissioner for the Environment.

Ministry of Education

The following Key Messages (Ministry of Education, 2007b) for the Government's purpose in EfS were espoused in the Request for Proposals for this evaluation:

- Education is a key part of the Government's strategy to protect and enhance the environment.
- Education for Sustainability will have social, cultural, economic and environmental benefits for all New Zealanders.
- Education for Sustainability links to New Zealand's developing image of a socially and culturally inclusive society committed to protecting and enhancing our environment.
- Education for Sustainability requires effective partnerships between a range of government and non-government organisations.

These key messages are affirmed by the Ministry of Education's *Statement of Intent 2007–2012* (Ministry of Education, 2007c) which recognises that education is "critically important" for New Zealand's long-term sustainable development, and that the Ministry of Education can support sustainable practices through influencing curriculum development (p. 17).

Two other key documents produced from outside the Ministry of Education also outline the Government's intended outcomes for EfS.

Ministry for the Environment

The Ministry for the Environment's *Learning to Care for Our Environment: Me Ako ki te Tiaki Taiao* sets out seven outcomes "sought by the Government" from environmental education:

- individuals, families and communities with the knowledge, skills, attitudes and values that result in sound environmental behaviour
- the effective transfer of knowledge gained from research and good practice to those that need it
- tangata whenua have the knowledge and skills necessary to fulfil their responsibilities as kaitiaki
- the effective use of environmental education to help people and organizations understand and implement environmental and other policies
- the well-informed participation of communities in issues affecting their environment
- the effective integration of environmental education within the school curriculum
- integration of environmental education into business and professional education in a wide range of sectors (Ministry for the Environment, 1997, p. 15).

Parliamentary Commissioner for the Environment

The Parliamentary Commissioner for the Environment's (2004) *See Change: Learning and Education for Sustainability* outlined aims and priorities and aims for EfS nationally.⁷ Key principles for EfS (across and beyond primary, secondary, tertiary and non-formal education) were outlined to: have a strong values base; include critical thinking and reflective learning; be future focused and participatory; focus on learning for life and across boundaries; and be transformative. The overall intention is that EfS will enable proactive whole systems "redesign" (rather than reactive problem management), and ensure that we "do things differently in the first place, instead of just cleaning up the symptoms of underlying problems" (Parliamentary Commissioner for the Environment, 2004, p. 38).

National EfS intentions: Curriculum documents

Currently, two main documents produced by the Ministry of Education articulate the intentions for school-based EfS in New Zealand: *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999); and *The New Zealand Curriculum* (Ministry of Education, 2007a). Both acknowledge the central importance of the Treaty of Waitangi in New Zealand's school-based education.

Environmental Education Guidelines

In 1999, the Ministry of Education published the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999).⁸ This document took its cue from mid-1990's international conceptions of environmental education and New Zealand's educational and cultural context, including commitment to the Treaty of Waitangi. The *Guidelines* specify aims (see Table 6 below), dimensions and concepts to help teachers plan for environmental education in their schools. There is a significant emphasis on sustainability, action taking, interconnectedness and Māori worldviews.

⁷ It also set out a range of recommendations that various organisations, including the Ministry of Education, were later evaluated against (Parliamentary Commissioner for the Environment, 2004).

⁸ At the time of writing this report, these *Guidelines* were under review to better align them with *The New Zealand Curriculum*.

Table 6: The aims of environmental education are for students to develop

Number	Aim
Aim one	Awareness and sensitivity to the environment and related issues
Aim two	Knowledge and understanding of the environment and the impact of people on it
Aim three	Attitudes and values that reflect feelings of concern for the environment
Aim four	Skills involved in identifying, investigating and problem solving associated with environmental issues
Aim five	A sense of responsibility through participation and action as individuals, or members of groups, whānau or iwi, in addressing environmental issues

A key goal of the *Guidelines* is to encourage environmentally responsible behaviour and informed participation in decision-making, and its vision is for a clean, healthy and unique environment that sustains nature and people's needs and aspirations.

The New Zealand Curriculum

The *New Zealand Curriculum* describes the Government's goals and the intended outcomes of school education in New Zealand. This study occurs at a time of transition from *The New Zealand Curriculum Framework* (Ministry of Education, 1993) to *The New Zealand Curriculum* (Ministry of Education, 2007a). The 1993 *Framework* made no mention of education for sustainability, and objectives focusing on the environment or sustainability were restricted to the science, technology, social studies and health learning areas. The 2007 *New Zealand Curriculum* represents a significant change. Eight principles for local curriculum design are specified, four of which could be seen as providing potentially transformative underpinnings for EfS approaches. They are *cultural diversity*, *inclusion*, *learning to learn* and *future focus*. Within the *future focus* principle, education for sustainability is included as one of four themes that schools can choose to include in their curricula or use to integrate their various curriculum areas. *Ecological sustainability* is one of eight specified values to be "encouraged, modelled and explored". Another value, also arguably strongly linked to action competence models of sustainability is *community and participation for the common good* (see p. 10). Furthermore, schools are encouraged to accept more autonomy in their curriculum decisions, working with their students and communities to develop a school curriculum that is most relevant to them (see p. 37). There is also a stronger emphasis on lifelong learning and the development of key competencies, which align with concepts of student development within EfS. Finally, the learning areas of Science, Technology, Social Sciences and Health have retained a focus on environment and sustainability.

Other guiding documents

A range of other documents, produced by EfS providers including, for example, Enviroschools, WWF, the Royal Society, local government agencies, provide further descriptors of desired outcomes for EfS. While each could be seen as heading towards a similar vision, they also have their own particular perspective on the principles, processes and outcomes that might be involved in creating a sustainable future within and beyond the education sector.

The challenge of ongoing change

EfS is an area that has grown over time, and compared with traditional learning areas, is broad in scope. The intentions encompass goals not just for student learning, but implicate a focus on the purpose and nature of schooling and the relationships between cultures, as well as outcomes for the environment and society in the short and long term. Meanwhile, the concept of "sustainability" has also evolved over time, and EfS developments have had to keep pace with—and contribute to—the increasing depth and breath of meaning and the actions called for.

This evaluation was conducted in a time of transition. During 2007–8, when the data in this report were collected, several changes were in process:

- *The New Zealand Curriculum* (Ministry of Education, 2007a) was released, replacing the previous *New Zealand Curriculum Framework* (Ministry of Education, 2003) and associated curriculum documents.
- A consultation process began to revise the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999).
- The Ministry of Education incorporated all of its major EfS contracts within the national EfS reference group, which was previously solely dedicated to the School Support Services NEfS team.
- International imperatives were shifting in relation to a growing awareness about climate change, unstable oil prices and a developing economic crisis.

EfS intentions according to NEfS documents and NEfS team members

The School Support Services NEfS advisory service is a professional development initiative set up to support school-based EfS. Its intentions are expressed through its NEfS strategy, two contracts to the Ministry of Education (national and regional) and the views of the advisors. We consider each in turn, before considering how these align with the intentions of EfS expressed in the international and national documentation outlined above.

NEfS Strategy intentions

A 35-page two-year *EfS National Co-ordination Team Strategy 2006–2008* supports the work of the National EfS team (Christchurch College of Education, 2006). The *Strategy* articulates the concepts, issues and guiding documents that inform the team's approach to EfS—extending the *Guidelines for Environmental Education* by examining the shift from Environmental Education through to a sustainability frame (pp. 13–15). It also outlines the core principles of the programme's EfS professional development, including how to bring about transformative ecological change management (pp. 17–18). It covers EfS pedagogy that informs both their professional development processes and the quality EfS teaching and learning they support in the classroom, re-orienting the teaching/learning processes to model sustainability and transform education at a deep level (p. 18).

Intended outcomes can be seen in the *Strategy's* vision, purpose and the “fruit” of their objectives. The purpose is that “the NEfS team will work in partnership with schools and kura, and key stakeholders, to be catalysts of change for sustainability in NZ society, through education” (p. 6). The long-term vision is:

Ko ngā iwi o Aotearoa. He tāngata whai tikanga. Kia toitū te rangi, te whenua, me te moana. Kia toitū te tangata. New Zealanders are innovative and motivated people who think and act sustainably. (p. 5)

The outcome for students, Ngā Hua (ie, the fruits of their work/objectives) is “learners developing action competence” (p. 9). Student outcomes are also framed in terms of the type of learning experiences they can be part of, the aims in the *Guidelines for Environmental Education* (Ministry of Education, 1999), the type of learners and citizens they will become and the wider impacts for their communities and New Zealand, for the present and future.

The *Strategy's* 12 objectives, each matched to at least one of the top four outcomes in the 2007 regional output schedule, are reproduced in Table 7 below. Although they are worded as objectives, each statement indicates an intended outcome,⁹ and the relationships between these outcomes are loosely represented by elements of the tree metaphor.

⁹ For example, if the objective is “To have cross-curricular standards in EfS registered on the NZQA framework” the outcome is “cross-curricular standards in EfS are registered on the NZQA framework”.

Table 7: NEfS Strategy 2006–2008 objectives

Aspect	Objectives (N.B. cross-referenced outcomes in brackets)
Te Rā/Sun	To promote EfS as an imperative for New Zealand and global society (2, 3, 4)
Status of EfS	To link student pathways from preschool education to tertiary education (4)
Ngā Kapua/ Clouds	To use data and evidence to advocate for higher status for Education for a Sustainable Future (EfS) in New Zealand schools and kura by having a stronger mandate in the curriculum framework (1, 2, 3)
Mandate for EfS	To have cross-curricular standards in EfS registered on the NZQA framework (1, 2, 3)
Ngā Peka/ Branches	To work in partnership with facilitators of the Enviroschools Programme to provide a holistic vision and support structure for schools and kura (2, 4)
Partnerships	To have a nationally coordinated programme which collaborates with key agencies, regionally, nationally and internationally, working for a sustainable future (4)
Te Kātua/Trunk	To ensure EfS promotes the teaching and learning strategies that reflect the key competencies of the curriculum framework (1, 2, 3, 4)
Quality teaching and learning	To ensure that EfS includes social, political, cultural, economic and bio-physical aspects (1, 2, 3, 4) To use evidence of student achievement to advocate for recognition and support for innovative teachers modelling effective practice in EfS (1, 2, 3)
Ngā Pakiaka/ Roots	To build the EfS team's own content and pedagogical knowledge (3, 4)
Support for advisors	To have more support for Māori pedagogy and understanding of EfS in each region to support kura and mainstream education (2, 3, 4) To have more acknowledgement/recognition/support from Ministry of Education/School Support Services for the special characteristics of the in-depth work of the regional EfS co-ordinators promoting quality teaching and learning in schools and kura (1, 2, 3, 4)

Table drawn from *EfS National Co-ordination Team Strategy 2006–2008* (Christchurch College of Education, 2006).

National output schedule intentions

The Ministry of Education national output schedule for School Support Services sets out: the focus of national EfS co-ordination; the intended outcomes; key tasks related to the outcomes; and data sources to demonstrate activities and achievements. The 2008 schedule also outlines responsibilities, communications and reporting expectations. It includes protocols for working with School Support Services managers and the Ministry of Education, as well as the role of the Ministry of Education's EfS Reference Group and a new School Support Services EfS Advisory Group.

The focus of the National Co-ordination for the 2008 EfS Output Schedule was:

To provide national co-ordination of the education for sustainability facilitators/advisors who are based within the six universities that deliver School Support Service contracts.

The outcomes for 2007 and 2008 were:

- professional leadership for regional EfS facilitators/advisors
- professional learning support for regional EfS facilitators/advisors
- the further development of a professional learning community in EfS
- evaluation of progress towards outcomes noted above.

Ultimately the two national co-coordinators are responsible for these outcomes, but reaching them involves input from the full national EfS team (which includes all 20+ regional advisors).

Regional output schedule intentions

The Ministry of Education regional output schedule for School Support Services sets out the EfS Advisory team's focus, intended outcomes, indicators, the knowledge base to be drawn from and the processes advisors will use. The focus of the School Support Services 2008 Output Schedule for EfS (C2) was:

The provision of professional development and support for teachers in schools and kura in respect of Education for Sustainability, and to provide links between schools and environmental communities of interest and responsibility, and providers of Education for Sustainability programmes. (Ministry of Education, 2008, p. 1)

This schedule is a variation on other "C-section" output areas covered by the overall Teaching Support Services contract. The standard outcomes intended to result from all advisory work in 2007 and 2008, including EfS, are summarised in Table 8.

Table 8: Summary of 2007 and 2008 Regional Output Schedule outcomes

Paraphrased outcomes	
1.	Teachers' and schools' reflective use of data, including student achievement data, for decision-making ¹⁰
2.	Change in teachers' beliefs and practices to help all students become successful learners, especially those (at risk of) underachieving
3.	Increase teachers' pedagogical content knowledge and subject knowledge
4.	Build inclusive school cultures ¹¹ and effective learning communities
5.	Schools have a plan to ensure developments can be sustained over time (added for 2008).

The indicators appear to be tailored to EfS specifically, and each indicator is associated with at least one (and most often all) of the outcomes above. The indicators are that: aims, key concepts and key dimensions of EfS outlined in the *Guidelines for Environmental Education* (Ministry of Education, 1999) are evident in teachers' planning; data are used for programme refinement; pedagogies appropriate for EfS are evident in teachers' practice (including experiential, co-operative, inquiry-based and action-based); Māori concepts related to mātauranga taiao are evident; there are working relationships with local iwi; and teachers are helping students work with environmentally focused partners.

The EfS advisors' intentions

When asked about the purpose of EfS advisory work, interviewees often mentioned the generalised outcomes specified in their output schedules while also pointing to some unique aspects of EfS advisory work within the broader Teaching Support Service teams. Below is a typical survey response to a question which asked "What is your understanding of the main purpose of the work of the EfS regional advisors?":

To work with teachers and schools to develop the pedagogies and the content knowledge to help them move towards whole school sustainability education through curriculum integration and action. (EfS adviser)

Unpacking their role further, EfS advisors discussed these additional dimensions that point to the outcomes they intend to achieve, and match well with their contracts and national and international EfS intentions:

¹⁰ In the 2008 schedule this was extended to another outcome: teachers and schools improve their practice and raise achievement through evidence-informed inquiry.

¹¹ In the 2008 schedule this was expanded to state "which acknowledge the identity and diversity of all students".

- Improve teachers' EfS content knowledge and therefore *what* they teach, to incorporate environmental, social, cultural, political and economic sustainability.
- Raise teachers' EfS pedagogy and therefore *how* they teach EfS and other learning areas (to involve authentic contexts, experiential learning, shared student decision-making, etc.).
- Enable EfS as a context curriculum development, and for teaching and learning in all curriculum areas.
- Coordinate and link together different EfS opportunities from various providers in a way that makes sense to schools, meets curriculum needs and suits teachers' demands.
- Focus EfS at a deep systems level, so that students investigate/address causes and complexities rather than symptoms or surface responses.
- Raise student achievement in EfS (broadly defined, but including action competence).
- Ultimately bring about more sustainable and action-competent individuals, schools and communities, where all make a difference for a sustainable future.

Advisors strive towards “good EfS” in all schools. Some paraphrased interviewees’ explanations of what “good EfS” entails are arranged under four key areas in the shaded box that follows.

Summary of advisors’ explanations of good EfS practice

Nature and structure of schools

EfS is a visible part of the school culture, conversations and documents (from school vision to teaching plans). The senior management is enthusiastic and committed, which is reflected in their own understanding of EfS and practical commitment to teachers’ learning journeys. It is a whole-school approach, with all school staff involved.

Curriculum development

EfS is ongoing, embedded and integrates several curriculum areas with the “front end” of *The New Zealand Curriculum*. Sustainability is a context for curriculum development, and sustainability knowledge (content) is investigated in different ways (including by using the “lens” of different learning areas). School sustainable practices, including community connections, provide authentic contexts for teaching and learning.

Teaching practice and pedagogy

Teachers provide transformational learning environments and model sustainability in their teaching practice and wider lives. They encourage analysis and problem solving to go beyond “surface” or “symptom” problems to underlying causes and future-focused thinking. They match assessment to the task (using NCEA flexibly), rather than developing tasks to meet assessment needs.

Students’ learning

Students make decisions about their learning and action, taking shared ownership of their learning, their school and their communities. Learning through EfS raises students’ engagement and achievement in all areas of schooling. Students and the school are buzzing, and learning flows through into behaviour change beyond the topics under study. Students demonstrate action competence and whole/living systems thinking.

Interviewees saw the purpose of national coordination work to be to:

- Strengthen the capability of the EfS advisors; for example, by providing a professional learning community amongst EfS advisors from across New Zealand.
- Ensure nationally consistent messages about EfS.

- Develop resources to support EfS from a quality teaching and learning perspective.
- Identify and contribute to EfS best practice regionally and nationally.
- Link EfS advisors to other organisations related to EfS, such as EnviroSchools, Department of Conservation, local government, businesses, etc.
- Engage in national educational developments that may have implications for EfS, or vice versa.

EfS Advisory Service's alignment with EfS intentions

This section addresses the alignment challenges signalled by part three of our first evaluation question: How do NEfS intentions align with, further clarify or sit in tension with the intentions of school-based EfS, with special attention to: the key motivations and developments that have informed and supported the initiation and growth of NEfS; internationally-promoted conceptions of EfS in schools; New Zealand and Māori conceptions of EfS/sustainability; and government/education conceptions of EfS (particularly the EfS outcomes expressed in: the Key Messages for EfS in schools; the *Guidelines for Environmental Education in New Zealand Schools*; and *The New Zealand Curriculum* (c)?

We begin by discussing the alignment between NEfS intentions and the advice on directions from these other sources in three ways: “through development” “in theory” and “on paper”. We then highlight a number of tensions that exist “in practice” which limit the ability of the advisors to fully realise their stated intentions.

In development: NEfS initiation and growth

Analysis of EfS Advisory documentation, especially the NEfS *Strategy*, and discussion with advisors and national coordinators, suggests clear synergy between this initiative and international conceptions of school-based EfS. It is clear the NEfS team has demonstrated an ability to learn from, and adapt to, emerging overseas (and local) experience over time.

Several members of the NEfS team were instrumental in defining, documenting and supporting the professional beginnings of EfS in New Zealand. The first co-coordinator of the National EfS Advisory Team (who only recently resigned) was one of the key writers of the first draft of *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999). He also co-led a School Support Services contract set up to pilot the guidelines across a number of schools: Environmental Education Professional Development 1999–2002 (Christchurch College of Education).¹² Several of the current EfS advisors trained as environmental education facilitators for this pilot project.¹³ In 2003 an EfS subcontract was set up within the main Teaching Support Services contract, for which each of the six School Support Services in New Zealand are now responsible and one of their success indicators is still to ensure that the *Guidelines* are evident in teachers' planning. Advisors' involvement in preparations for a potential review of the *Guidelines for Environmental Education* suggests that the NEfS team may already be aiming *beyond* the aims of the current guidelines.

¹² Another Ministry of Education programme set up subsequent to the release of the Guidelines was Professional Development for Sustainable School Organic Gardens. It was run, in 2002, by Massey University and the Soil and Health Association of New Zealand (Bolstad, Baker, Barker and Keown, 2004).

¹³ At that stage it was independent from the large Ministry of Education Teacher Support Services contract (which now includes EfS Advisory) but had similarities in the fact that a number of regional facilitators were employed through School Support Services to run workshops with teachers around New Zealand.

The international move from “environmental education” towards “education for sustainability” is reflected in the EfS advisors’ description of their work.¹⁴ Seventy-five percent of EfS advisors prefer to use the term EfS, because it captures things wider than environment¹⁵. The team had earlier wanted to be called Education for a Sustainable Future partly because it reflected international trends and was more “concrete”. As at late 2007, most EfS advisors claimed to understand intentions around environmental aspects of sustainability better than other aspects (social, political, cultural and economic), although at least one adviser noted that these are inseparable and that ecosystems are the base of maintaining all the other “aspects” of sustainability, metaphorically and physically, as is suggested by international literature on “strong sustainability” (Sterling, 2001).

The NEfS team aims to develop an EfS knowledge base that is distinctly New Zealand, and they aim to support schools to develop EfS in ways that make sense to—and draw on the knowledge of—local communities. Some national NEfS development processes aim to develop new knowledge in EfS, from which teachers and resource writers can draw. For example, there are several working groups, each made up of a subset of the advisors from different regions (some also directly engage teachers and others, as EfS co-inquirers and co-leaders are developing EfS documents and trialling draft materials).

The NEfS *Strategy*’s bicultural vision for EfS is visually represented by two sides (in te reo Māori and English) of an unfurling koru. Advisors spoke about what Māori perspectives can bring to EfS, as well as the possibility that Māori worldviews might offer quite different but complementary conceptions of, and approaches to, EfS. The *Strategy* states that:

The national EfS coordination team has a personal commitment to explore, integrate and foster New Zealand multi-cultural heritage into all EfS professional development activities. The national co-ordination training programmes address regional requirements for involving a Māori dimension in all regional programmes. (p. 15)

Within the NEfS national coordination team there is no formal partnership with kaupapa Māori based organisations or Māori advisory teams within School Support Services.¹⁶ However, looking forward, interviews and the NEfS *Strategy* suggest that the team aims to continue to build opportunities to: build their own cultural knowledge (for example, through workshops with Te Mauri Tau in partnership with Enviroschools); collaborate with others to run professional development for schools (for example, one adviser had co-facilitated a workshop with Waitangi Education Trust); and/or support schools to develop their own collaborations with, for example, local iwi.

The international focus on a whole-systems approach is reflected by the EfS advisors shifting from one-off engagements with individual staff members across multiple schools, to more in-depth work with wider professional learning communities within individual schools (and where possible local clusters of schools) to bring about long-term, transformational, self-regulating, whole-school change.¹⁷ Whole-school change outcomes are envisaged to incorporate not just shifts in teaching and learning, but all aspects of school (and community) life, from sustainable management practices, visionary leadership and shared decision-making, to environmental responsibility and active engagement with the local community.

¹⁴ Many had a “get on with it” attitude: decide what it is called, have discussions and resources so that there can be consistent messages about its broad meaning rather than endless debate of terminology.

¹⁵ One respondent preferred Environmental Education, two Education for Environmental Sustainability, and two other.

¹⁶ At least one adviser spoke of a working relationship between their particular regional EfS Advisory team and the Māori Advisory team within their School Support Service.

¹⁷ This also aligns with New Zealand’s Best Evidence Synthesis on Professional Learning (Timperley, Wilson, Barrar & Fung, 2007), which is based on international and national studies.

In theory: NEfS practice to EfS outcomes

From an ecological change perspective, the NEfS teams' principles and aims seem to make sense for bringing about transformational change. Here we provide a brief account of the “logic” or “flow” of change that suggests the NEfS team is putting its focus on the right places to lead towards their vision for New Zealanders who are innovative and motivated people who think and act sustainably and other broad EfS intentions.

From NEfS documentation and interviews it appears that the central aims of the NEfS advisory service are to catalyse transformational change across: the nature and structure of schooling; cross-curricular contexts and content; and teaching and learning. It is not possible to perfectly map exactly what should change in what order, as interrelated changes in school structures, pedagogy and curriculum are intended to be locally designed according to each school's unique context and the vision shared by its community. Therefore the principles that guide NEfS professional development (eg, collaborative, action-oriented) are important as they model the ways that teachers and schools can operate to generate new “ways of being” across the school.

Core to this transformation process are new learning opportunities for students that are based on set of interrelated pedagogies with a focus on sustainability. Like NEfS professional development principles, EfS teaching pedagogy should integrate curriculum areas and be student-centred, authentic, action-oriented, cooperative, experiential and inquiry-based. Involving the community beyond teachers and students is also important, because it enables schools and students to draw on appropriate expertise and build networks where new knowledge generation is possible. Through these experiences it is expected that students will have the opportunity to develop in many ways, including, for example, through values clarification, integrative awareness, futures creation, living systems thinking and behaviour change. These are hoped to raise student achievement, both in traditional academic disciplines and holistically as people. Action competence is one way to describe student achievement through EfS. It incorporates action taking, knowledge gathering and reflection towards sustainability.

This whole change process of transformation is intended to build sustainable schools, communities, nations—a sustainable future. Key elements seen as necessary for a sustainable future include, for example, collaborative knowledge generation, participatory interrelationships, cultural regeneration and active citizenship. Again, these are intended to be modelled in NEfS professional development, to become part of the operating principles of schools and their communities and to manifest in students themselves (as well as school staff and community members).

Rather than just being an input near the start of this change process, many EfS advisors have a sense of responsibility for stewarding this whole process of change, noting where—and what—support is needed, while recognising that they are well positioned to provide expertise on teaching and curriculum. This means that they work primarily with teachers, but a core intention of their work is to develop EfS networks (including school-to-school, school-to-community and school-EfS providers/experts) so that learning can be shared, reflective and ongoing. With change being complex and dynamic the advisors aim to constantly adapt in order to best support EfS principles and outcomes to emerge within any given context. The various EfS guiding documents provide “signposts” to help them navigate along the way.

On paper: The NEfS documents' alignment with EfS intentions

On paper there is clear alignment between the NEfS advisory service, and messages/goals/ outcomes (“intentions”) of school-based EfS. Key NEfS contracts and documents are cross-referenced to each other. Similarly, they make reference to EfS intentions outlined in the wider national and international documents outlined above.

The NEfS *Strategy* probably best represents this alignment. It brings together the standard School Support Services outcomes and the unique nature and intentions of EfS (through the NEfS objectives cross-referenced to the Output Schedule outcomes, as presented in Table 6). These objectives also align with both the *Environmental Education Guidelines*, which zoom in on intentions for teachers and learners (and their relationship with other groups) and the

Ministry of Education's *EfS Key Messages*, which appear to further emphasise the role that EfS plays in bringing about social and political change. The NEfS *Strategy* is intended to be a working document that will be used to evaluate progress and capture new directions/goals over time:

We had to focus our goals and we are actually working along those guidelines. There has been a shift from the writing of that document and the whole team carrying it out—it will be dynamic and updated regularly and people will use it for a context of what they're doing. It is also good to have it for the basis of our team but it can also enhance the Toitu te Ao philosophy of the three groups and maintain our points of difference. (National co-coordinator)

The Regional Output Schedule's lists of indicators and processes also make specific reference to the *Guidelines for Environmental Education* and *The New Zealand Curriculum* (including the key competencies). Also, one might argue that since the generalised School Support Services outcomes are based on professional learning theory, each could be seen as a short-term mechanism to enable longer term EfS outcomes.

Similarly, NEfS commitments to the Treaty of Waitangi and cultural diversity are outlined on paper. One of the *Strategy*'s objectives is "to have more support for Māori pedagogy and understanding of EfS in each region to support kura and mainstream education" (p. 9).¹⁸ It is located in the "root" of EfS development which represents support for the advisors. A related responsibility for the national team is to provide professional development for advisors to increase competence in Māori pedagogy (p. 12).¹⁹ One of four key focuses for the work of all School Support Advisors, including the NEfS team, is "improving the classroom practice to meet the diverse needs of all learners including Māori and Pasifika". Indicators with particular relevance to EfS include "Māori concepts related to Mātauranga taiao are evident in planning and implementation of curriculum" and "meaningful working relationships that support EfS practice are established at the school and district level with local iwi". The national co-co-ordination output schedule makes no specific mention of working with Māori or Māori conceptions of sustainability.

To the best of our knowledge the Key Messages²⁰ for EfS that we received from the Ministry of Education on the Request for an Evaluation Proposal do not appear in the School Support Services EfS Advisory documentation. However, we also suggest that the key messages' focus on EfS enabling big picture social change in line with the Government's sustainability agenda, is implicit in the advisors' intentions and approaches, as well as the NEfS *Strategy*.

In practice: Opportunities and tensions

Our interviews with EfS advisors and co-coordinators, as well as three School Support Services managers, suggest that in practice team members do make the necessary connections between the objectives and outcomes in the various documents that guide their work, including the standardised School Support Services outcomes, and the overall perceived messages, goals and intended outcomes for school-based EfS. National-level responsibilities and membership in NEfS align with—and contribute to—the advisors' regional responsibilities to support good EfS in schools. Advisors spoke about the value of the national team and of attending hui that could support their professional learning to "inform my practice in my region".

¹⁸ Four key aims related to this approach are outlined in the Strategy, and provide some insight into the ongoing journey of the NEfS team. These include identifying key strategies for Māori professional development in EfS, ensuring that funding is available for Māori professional development in EfS, identifying ways that trained Māori EfS professional development providers could support advisors and integrating suggestions from the new Mātauranga Taiao co-ordination team into the national EfS team.

¹⁹ Two also noted that EfS advisors are required to help raise Māori and Pacific achievement but they do not necessarily feel that they have the appropriate cultural knowledge or skills to do this work.

²⁰ As included in the Request for Evaluation proposals.

However, some misalignments are also evident in the interface between the various NEfS's guiding documents and practice. If one considers each key document (including, for example, the output schedules, *Guidelines for Environmental Education*, and *The New Zealand Curriculum*) to be a component of New Zealand's school-based EfS system, it is possible to see that the drivers and scope of each are somewhat different. While there is always the potential to add up to ideal EfS outcomes in schools, we see four interrelated tensions that present a particular challenge for meeting NEfS/EfS intentions, none of which are within the immediate control of the NEfS team itself.

1. A focus on standardised outcomes

The EfS advisors operate in an environment that foregrounds standardised School Support Services outcomes and reporting requirements, which has some perceived benefits for the effectiveness of the overall School Support Services advisory team but also presents some tensions. Interviewees who spoke of being part of School Support Services mentioned both positive and negative impacts on their ability to influence EfS in schools. On the positive side, advisors gain some sense of identity amongst the full range of EfS providers from the School Support Services' emphasis on professional development/learning communities geared towards improving curriculum-based teaching and learning that leads to student outcomes. Benefits included advisors' access to:

- School Support Services resources
- a wide professional community of advisors beyond EfS
- professional development as part of wider School Support Services opportunities.

In contrast, perceived negatives included being subsumed under standardised contracts and generalised outputs, outcomes and reporting requirements, which several advisors understood to have been set up mainly for provision of support to single curriculum areas:

The School Support Services framework has a more, not necessarily linear, but mechanistic approach to meeting particular requirements within the Teaching Support Services contract. So we gained freedom in one sense but not in another—it's not necessarily a negative but it took an awful lot to do to get up speed. (National co-coordinator)

EfS is different from other areas where advisory support is provided to schools. It is not prescriptive or 'cut and dried' ... and is very much needs-based, there is no 'one model fits all' scenario. [Also] gathering data to provide evidence of shifts is extremely challenging (especially student achievement data) as EfS is closely related to values and attitudes and changes in this domain may not be evident immediately. (EfS adviser)

Many advisors pointed to unique aspects of EfS advisory work within the broader Teaching Support Service teams, such as:²¹

- There is little curriculum mandate for EfS and few related national curriculum resources.
- There is a focus beyond teaching in schools, towards partnerships with other EfS providers and community groups, etc.
- Because of the limited extent of current EfS practice in schools and in teacher training, there is a limited pool of potential EfS advisors from which to draw.

²¹ We return to some of these in more detail later in this report.

- Regional advisors are accountable to national EfS co-coordinators as well as their regional School Support Services managers.

Some advisors suggested that their relationships with the national EfS team and its co-coordinators have provided the only space within which their EfS work is truly understood and supported. They did not feel their role was particularly well understood in their regional School Support Service (but note that this was not the case for everybody we interviewed). Some also expressed concern that the popularity of the term “sustainability” has been trivialised within (and beyond) School Support Services, evident in phrases such as “sustaining the maths programme”:

We still operate in silos within the School Support Services. EfS [advisors] are off the radar because we’re not mandated.

As we discussed above, EfS calls for an ecological change process (eg, where new understandings and aims are generated by “doing” and “co-constructing” new knowledge in the area) which means that it can be difficult to specify the exact steps for EfS advisors to follow. This appears to contrast with their contracts which set specific outcomes to be achieved and the expectation that these can be clearly monitored and evidenced. A related challenge is that the main Regional Output Schedule outcomes (presented on page 21) determine the process, or short term mechanism, by which EfS goals are expected to be reached. While these are based on sound professional learning literature, they may not necessarily reflect professional learning in truly innovative contexts where the goals are extremely “big picture” and uncertain (much as in paradigm shifts in society). Even the “personalised” EfS indicators do not convey the rich nature of EfS or its transformative vision. The effect could be that the EfS advisors become overly accountable to—and spend a lot of energy on—developing an evidence base that is standardised and quantitative, pulling their attention back to known short-term outcomes and sapping the creative energy needed for this kind of work.

2. National co-coordinators’ limited scope

The national co-coordinators operate in an environment where they have responsibility for the overall professional learning, resource development and direction of NEfS, but have very little control over key decisions at a regional level. This means, for example, that they do not have control over—or even necessarily input into—the recruitment of new team members, the work programmes of regional advisors, or the milestone reporting and other reflective data collection/analysis within each region (which gives an indication of progress, effectiveness and issues to be resolved).

Several interviewees perceived a lack of cohesiveness between the regional and national contracts, and their separate management systems, which culminated in competing demands between their regional and national roles. At least one wanted clearer acknowledgement of their joint role:

[The national role is] a time impediment, not a value impediment.

They’ve got two contracts. You’d think they could marry them together.

While three interviewees, including School Support Services managers, mentioned that the current boundaries between regional line management and national co-ordination are important to maintain, other interviewees suggested that these operational systems are counter-productive to building EfS capacity and modelling EfS sustainability nationally. They believed that the national team and/or national co-coordinators needed to be able to have a greater level of self-determination within School Support Services, or at least be part of more shared and transparent decision-making and data sharing.

3. Limited resources and trade-offs

The NEfS team is operating in an environment of limited curriculum resources and limited School Support Services resources dedicated to their contract. The size and mandate of the NEfS team is dependent on decisions made by the Ministry of Education, as determined by the Government and Education Ministry representatives in negotiation with School Support Services managers, EfS advisory/reference group(s) and NEfS co-coordinators. Funding levels determine the priority that is given to EfS within each School Support Service. This was bolstered when the Government pledged funding for four years (2007–10). As one School Support Services manager commented:

Because [the EfS Advisory work] sits in C-section of the Teaching Support Service contract, the Ministry dictates what goes in and we discharge it. Because EfS is given priority by the [Labour-led] Government, due to an agreement with the Greens, our funding has increased ... Now we have got four people who work in that area, not all full-time. When you put that alongside other subject areas which would be between 1–2 full-time equivalents per curriculum area, EfS has quite a high level of priority. (School Support Services manager)

Another manager offered a different perspective:

When you look at the amount in numeracy [adviser FTEs] compared to EfS [adviser FTEs] of course you are going to get more coverage in numeracy. (School Support Services manager)

Obviously resources are never limitless, but most interviewees suggested that they were under a lot of pressure. We note the fairly low ratio of FTEs in comparison to the geographical spread and number of schools that could potentially receive support from these advisors. All three of the School Support Services managers we interviewed also expressed some concern about the high workload of the co-coordinators and risks around successful succession. The introduction of a co-coordinator was seen as a positive step, but not necessarily sufficient considering the part-time nature of their roles and the amount and range of work involved.

Advisors are in a position where they need to make very real trade-offs between their national and regional roles and the breadth and depth of support for EfS in schools. Both have implications for their ability to facilitate widespread engagement and EfS outcomes. In terms of the trade-off between regional and national work, the 2007 output schedule stipulated three to six days on national-level EfS work per coordinator. However, some advisors did not appear to be clear about whether this existed, whether it was really what happened or whether the time allowance was sufficient. That said, all interviewees spoke of the importance of the national work, partly because EfS is relatively new and complex with few supporting national resources.

There are few national education documents in the area of EfS specifically for EfS School Support Services advisors to work with. For example, there is no curriculum document in EfS as compared with subject areas such as science or social studies. Considering time (un)availability and the spread of expertise, two interviewees wondered whether there might have been a better way to undertake national resource development²² (even though many advisors acknowledged their professional learning from this process):

If we had a resource team behind us where we were working in schools and could identify what their needs were, and have a team of people building the resource base [then] that would be fantastic. (National co-coordinator)

²² Resources in the pipeline through the NEfS working groups include a NEfS website (launched in 2008), a number of books that explore EfS pedagogy and tools for data collection. These have taken longer to develop than expected, due partly to competing demands on advisors for their region-based work.

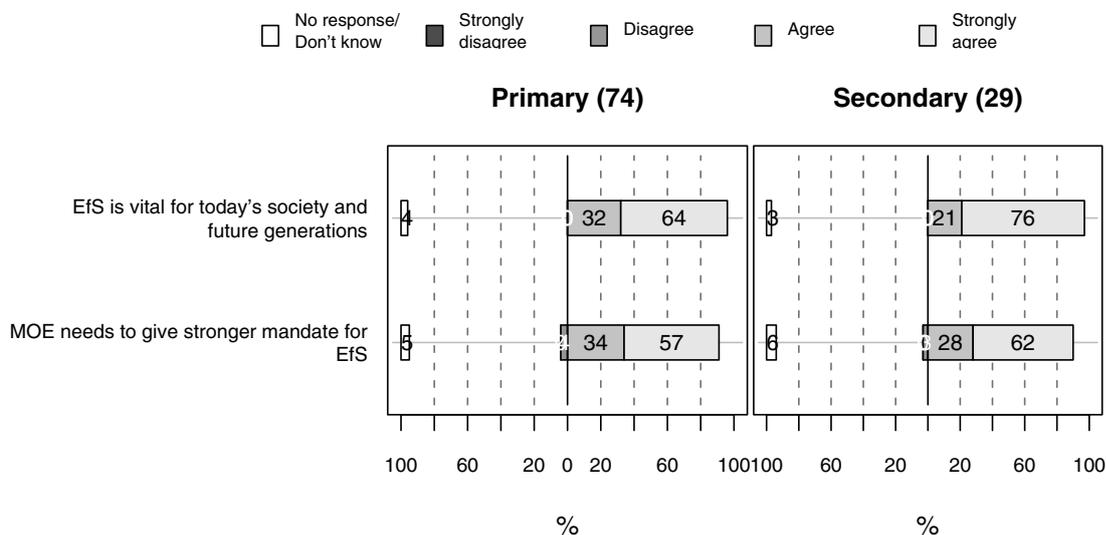
I would like to have seen the group for national resources ... to be a separate contract that could involve people who had the experience and wanted to do the work—perhaps in Learning Media with advice coming from [the national co-coordinators] with others feeding in so there is the right skill set. (School Support Services manager)

NEfS interviewees commented that, to bring about sustainable change despite limited resource, they try to “back winners” and avoid the “spray and pray method”. A development in some regions is to work with clusters of schools,²³ in addition to one-on-one work in individual schools, or running open-entry workshops for whoever is interested in a given topic in their region.

4. Inconsistent messages in the public domain

The NEfS team is operating in an environment in which there is a great deal of publicity about environmental issues. Various messages are being transmitted to schools about the importance of EfS, either explicitly or implicitly. While EfS advisors try to work with the Ministry of Education and school leaders to better align these various messages, in general there appears to be a level of frustration about a perceived mismatch between the urgency of individuals’, schools’, communities’ and countries’ commitment to create a sustainable future, and the system support they get for their efforts. Figure 2 below shows that almost all the surveyed school respondents see EfS as vital for today’s society and future generations, and almost as many think that the Ministry of Education needs to give a stronger mandate for EfS. These are educators who are committed to working in this area. In a different question set, and doubtless reflecting a level of frustration with current efforts, over a third of the survey respondents suggested that the support for EfS from government policy was “poor”.

Figure 2: School respondents’ views on EfS importance and mandate



Two NEfS *Strategy* objectives relate to the statements in Figure 2. Only four advisors thought that good progress had been made on promoting EfS as an imperative for New Zealand and global society, and only five thought clear progress

²³ One adviser observed that different regions and schools are more suited to cluster work than others. For example, they had found that clusters (including e-clusters) worked better in Northland than in Auckland.

had been made on gaining recognition and support for EfS advisory work from the Ministry of Education. These represent two of five objectives where ratings suggest least progress had been made.²⁴

We received positive—but slightly mixed—messages about how well the revised *New Zealand Curriculum* (Ministry of Education, 2007a) represents a coherent position on sustainability. All interviewees spoke of the traction that this curriculum can give to further develop EfS content knowledge, curriculum integration, pedagogy and partnerships.²⁵ However, the survey data that we present in the next chapter also suggest that EfS is seen to serve the intentions of the curriculum slightly more so than the curriculum is seen to serve EfS.

The four tensions we have discussed above may warrant further consideration if the Ministry of Education's EfS *Key Messages* and *Statement of Intent* are to become reality.

Evaluating NEfS alignment with EfS intentions

This chapter drew on our analytic framework (international literature, New Zealand/Māori conceptions and national documentation) to evaluate how well the aims and implementation structures of the NEfS initiative align with global EfS intentions.

We found that the work of the national EfS team aligns well with international and national conceptions of EfS. The contractual and organisational arrangements of EfS provide for a strong professional learning base, thus modelling the innovation and collaboration principles that are essential to EfS. The team's history of ongoing learning and adaptation demonstrates how it has provided valuable input into the development and extension of EfS thinking, and this is reflected in key documents such as its *National Strategy*.

We found little written theoretical documentation to provide conceptual guidance about Māori viewpoints on EfS. Nevertheless, the NEfS team has gone some way towards creating space for Māori perspectives in EfS, partly through their advisors' professional learning and through some regional partnerships with Māori School Support Services advisors and others. However, the indications are that more work, support and co-ordination are needed in this area.

Notwithstanding some tensions between specific EfS goals and the more general goals of School Support Services, the EfS Advisory programme has succeeded in making workable alignments between School Support Service contractual requirements, broader EfS intentions, and the ecological approaches to school transformation that are such a strong signal in international EfS theory and suggested best practice. The challenges of translating theory to practice here should not be underestimated. Together with the related EnviroSchools and Mātauranga Taiao initiatives, the EfS initiative is attempting to bring about whole systems change in schools and education, and in students and society. The level of resourcing provided for the NEfS Advisory service is somewhat limited considering the scope of these challenges. The EfS advisors have demonstrated strong commitment to their work and the limited hours allocated for this mean their roles could be unsustainable in the longer term. It could be that solutions to this dilemma will reside in the development of more strategic ways to support the ongoing work, particularly in terms of national-level resource production.

²⁴ Five or fewer advisors agreed that good progress had been made on five of the 12 NEfS *Strategy* objectives listed earlier in this chapter.

²⁵ We will look at the alignment between EfS and the curriculum in several ways throughout this report.

4. The nature and perceived effectiveness of advisors' own practice

We now begin to address the second question of the overall evaluation: “How effective are the three initiatives in ‘operationalising’ EfS key messages and achieving EfS goals in schools?” The overarching question was broken down into a series of specific subquestions, and Table 9 shows the three subquestions that we answer in Chapters 4 and 5. (We present and answer the remaining subquestions in Chapters 6, 7, and 8.) Questions for the overall evaluation have been adapted to maximise their relevance to the NEfS initiative in particular.

Table 9: How Q2a–c was adapted for the NEfS initiative in particular

Main evaluation question (Q2)	Question and subquestions adapted to NEfS
How effective are the three initiatives in “operationalising” EfS key messages and achieving EfS goals in schools?	How effective are the NEfS Advisory Services’ operational practices at supporting EfS in schools, and what has it achieved in relation to EfS intentions expressed in Chapter 3?
Main evaluation subquestions (Q2a, b, c)	
a) To what extent do the initiatives individually contribute to the achievement of EfS goals?	What do participants see as the unique contribution that the NEfS Advisory Service makes to the achievement of EfS goals?
b) How do the three initiatives work together and complement each other to achieve EfS goals?	How do participants think the three EfS initiatives work together and complement each other to achieve EfS goals?
c) What and how do contexts, processes and practices support the achievement of EfS outcomes within each initiative?	What practices/processes does the NEfS team use to serve EfS intentions, and how useful do evaluation participants see these to be? (part one) What factors/contexts particularly challenge the ability for EfS advisors to serve EfS intentions? (part two)

This chapter reports on the advisors’ understanding the processes of the EfS advisory programme and their perceptions of the effectiveness of their work, particularly in the light of the ambitious goals laid out in Chapter 3 with their associated tensions. The chapter outlines one half of the evidence needed to address the first three subquestions to Question 2.²⁶ Chapter 5 will address the same questions from the perspective of the teachers and then discuss the overall evidence related to these evaluation subquestions.

NEfS effectiveness in relation to its unique and collaborative nature

Rather than addressing the subquestions in a linear fashion, the sections that follow *foreground* one or two while including maintaining a more holistic focus across all of them. First we look at relationships between EfS and the other two initiatives (subquestions 2a and b). Overall, this section demonstrates that in some cases the three initiatives operate individually, and in other cases they work together collaboratively but uniquely.

Relationships with Enviroschools

Responses from the advisors we interviewed suggested that there is co-operative sharing between Enviroschools and the NEfS Advisory Service at the national level. This enables the initiatives to work together strategically to influence change, as well as to clarify and maintain their unique identities/roles.²⁷ As a co-coordinator put it, “We have a fantastic relationship and it’s symbiotic [in that] we’ve both benefited from each others’ existence.” In 2007, representatives

²⁶ Outcomes subquestions are addressed in Chapters 6 to 8.

²⁷ As at late 2007 there was an NEfS Advisory representative on the Enviroschools Board, and Enviroschools leaders attended NEfS hui.

from Enviroschools, Mātauranga Taiao and NEfS came together to develop principles for working in relationships while maintaining their points of difference as EfS providers:

We need to develop common overviews around how to work structurally within regions and look at disparities between regions. Because our advisors are part of the Enviroschools makeup in their regions, we need to make sure that the holistic overview of how we work is shared in the national team. (National co-coordinator)

The NEfS *Strategy* is driven by research knowledge about the challenges of educational transformation. It focuses primarily on teacher professional development and teacher learning communities, and appears to foreground the importance of teacher pedagogy, curriculum development and student outcomes and achievement. Doing so may involve helping schools to develop networks with others within and beyond education and sustainability organisations, including Enviroschools facilitators. From the perspective of one interviewee:

We have a contract with specific outcomes on teacher professional development and learning outcomes and achievement for students. [Enviroschools] have more a holistic mandate. For example, they also have an eco-building remit, which is not our role specifically, but we bring in people to support it—in this case we bring in Enviroschools. More of our focus is on Ministry of Education requirements around curriculum and delivering that curriculum through EfS. (National co-coordinator)

At the regional level collaborative relationships between the initiatives appear to be based on pragmatics, partly dependent on skill sets and availability of the facilitators employed within each programme, and partly on the relationships that they have established over time. NEfS professional development provides an alternative to schools that do not want to become an Enviroschool, or schools that are in regions without a facilitated Enviroschools programme.²⁸ Many advisors have participated in Enviroschools training and some also act as Enviroschools facilitators in their region.²⁹ Advisors spoke of their working relationships with Enviroschools in two ways. Either they worked in different schools to avoid double-up, or they worked with the same schools providing different but complementary expertise:

We have good strong relationships. I see my role as supporting those Enviroschools facilitators and Enviroschools schools where I can, especially with the curriculum work but also in working as a team—we think ‘What are our personal strengths?’...We try to run workshops together. (Adviser)

²⁸ According to the NEfS database, and school survey responses, about 40 percent of the schools that the advisors work with are not Enviroschools.

²⁹ The relationship between NEfS and Enviroschools partly depends on regional arrangements. In some regions NEfS advisors fulfil the role of an Enviroschools facilitator.

The case study findings outlined in the box below show how these flexible processes were experienced by the schools.

Both the case study and sole-interview primary schools were Enviroschools. Interviewees in both schools said they experienced seamless support for EfS development from Enviroschools and NEfS, even though they were aware that the support came from different initiatives with slightly different parameters. Enviroschools had provided fairly intensive on-the-ground support for a given period (through the Enviroschools-facilitated programme), which had been supported by (and in one school suggested by) EfS advisors who worked with the school before Enviroschools facilitation and again, along with a cluster of other schools, beyond the Enviroschools facilitation period.

Both the case study and sole interview secondary schools also had involvement with Enviroschools. Interviewees from these schools made stronger distinctions between EfS Advisory and Enviroschools, perhaps because they had not received Enviroschools facilitation for teachers. Interviewees at the case study school said that the Enviroschools Awards provided a useful framework of aims for them to work towards, although saw these to be particularly challenging in a secondary context. The awards had provided excellent opportunities for students to become involved in outside of class time, as for example in the Youth Jam initiative. The sole interviewee at the other secondary school also said the main role of Enviroschools was to provide opportunities for students, in particular to take part in a student-led Enviro-group and local sustainability activities.

Relationships with Mātauranga Taiao

At the time of our interviews with EfS advisors in 2007, there was a developing relationship between NEfS Advisory and Mātauranga Taiao, and stronger relationships had been built at a national level and within some regions. Interviewees expected that the different roles and relationships between Mātauranga Taiao and NEfS Advisory would become clearer over time.

The process of NEfS professional development and its perceived effectiveness

As just outlined, the EfS advisors are clear that their role is in teacher professional development. How do they go about helping teachers learn, and what factors and contexts challenge their ability to do this in the spirit of the EfS intentions? This section reports advisors' perceptions of their processes and their effectiveness, first at the national and then at the regional level. It thus addresses subquestion 2c, part one (see Table 9 above).

National-level practices and their perceived effectiveness

The primary role of the nationally co-co-ordinated NEfS team is to provide a professional learning community for EfS advisors themselves, and to help lead thinking in—and advocate for—EfS at a national level. How well are they doing this?

Three School Support Services managers attested to the positive impact of the national co-co-ordination. In their view the two national coordinators are key catalysts and consistent advocates for EfS in New Zealand. These individuals have built the capability of the EfS team, and raised its effectiveness in working with schools. Interviewees from the EfS Advisory team also spoke of the importance of the national team as central to an EfS professional learning community. They particularly value this because they work in an educational environment that does not yet fully grasp EfS. Some advisors said their main professional learning support comes from being part of the NEfS team supported by the national co-coordinators, but others considered it to come equally from the national team and from their regional School Support Service and its range of advisors working beyond EfS.

In the 2007 survey, advisors were asked to indicate, from a provided list, the professional learning opportunities in which they had taken part, and to rate the usefulness of each of these on a Likert scale. In descending order of *average*

usefulness,³⁰ professional development opportunities for the EfS advisors were NEfS working groups, Enviroschools Level 2 training, EfS New Advisor training, national hui prior to October 2007, the October 2007 national hui, and Enviroschools Level 1 training. All advisors had accessed at least three of these possibilities. About two-thirds of the surveyed advisors recorded other useful professional development, including New Zealand Association for Environmental Education (NZAEE) events, university papers or degrees, one-off related seminars, conferences or workshops, other Enviroschools workshops, shadowing another EfS adviser and in-house School Support Services professional development opportunities. Concern was expressed that EfS-relevant professional development is not very common in New Zealand and there is little time to upskill or participate in professional learning conversations because of the high levels of demand for work in schools.

That the highest professional learning value was placed on NEfS working groups³¹ supports perceptions of the critical support role played by the national team, as outlined above. There is a double benefit here. Not only do these working groups provide a form of professional development, they are also geared towards producing resources that will support all EfS advisors and schools in the long-run (although as discussed in Chapter 3, time frames for resource development have elongated, possibly related to limits of time and expertise). In addition, a number of EfS advisors work on at least one complementary EfS contract outside the scope of the evaluation. Examples could include a Teaching Learning Research Initiative (TLRI) project³² or an EfS achievement standards development contract. Several interviewees mentioned that these additional opportunities had influenced the way they conceptualised their role and had impacted positively on the way they now carried out their work. Again there is a double benefit when work for a specific purpose informs the wider national role.

Table 10 summarises advisors' views of the impacts of the national team in relation to whole-system change, as indicated by the national objectives for the initiative. The 12 objectives cluster into five aspects, meaning that each aspect has at least two objectives and some have three.

When reviewing these ratings it is important to remember that many of the advisors may not have in-depth knowledge of all the work that occurs under the national co-co-ordination contract. (This could well apply to the second of the "status" objectives—creating pathways from preschool to tertiary, which was the least likely to be rated as progressing well, and the most likely to be left blank.) Nevertheless, the patterns of responses suggests that, overall, the national co-ordination process is perceived by the majority of advisors to be progressing well in relation to half of its objectives and making at least some progress in relation to most of the others.

Note that two of the "quality teaching and learning" objectives related to curriculum change are seen to be progressing well, but less successful progress is perceived for the third aspect. Evidence of student achievement is not as clear cut to describe in the EfS area because it entails values and actions that are not immediately assessable, at least with today's assessment assumptions, procedures and tools. This has already been noted as an area of tension between generic School Support Services objectives and specific EfS objectives, and we will return to this discussion in the final chapter of the report. Other areas of greater difficulty relate to aspects of improving EfS status and mandate, outside of the important milestone of the newly developed EfS achievement standards. This is not surprising since these objectives describe big-picture, longer term goals. Slower progress in the area of building appropriate knowledge to support Māori pedagogy and EfS understandings accords with the findings reported in Chapter 3.

³⁰ Only those who attended were used to calculate each average.

³¹ Nearly all EfS advisors take part in at least one.

³² This action research project has been working towards developing frameworks to support the formative assessment of students' action competence and whole-school approaches to EfS.

Table 10: Progress made on NEfS objectives, as rated by advisors in late 2007 (n=20)

Aspect	Objective	Progress being made or well achieved	Slow/initial progress	No progress being made	Did not respond
Status	To promote EfS as an imperative for New Zealand and global society	4	12	1	3
Status	To link student pathways from preschool education to tertiary education	1	8	3	8
Mandate	To use data and evidence to advocate for higher status for Education for EfS in New Zealand schools and kura by having a stronger mandate in the curriculum framework	4	7	4	5
Mandate	To have cross-curricular standards in EfS registered on the NZQA framework	14	1	-	5
Partnership	To have a nationally co-ordinated programme which collaborates with key agencies, regionally, nationally and internationally, working for a sustainable future	12	4	-	4
Partnership	To work in partnership with facilitators of the Enviroschools programme to provide a holistic vision and support structure for schools and kura	16	1	-	3
Quality T&L	To ensure that EfS includes social, political, cultural, economic and bio-physical aspects	15	1	1	3
Quality T&L	To ensure EfS promotes the teaching and learning strategies that reflect the key competencies of the curriculum framework	16	1	-	3
Quality T&L	To use evidence of student achievement to advocate for recognition and support for innovative teachers modelling effective practice in EfS	6	7	2	5
Support	To have more acknowledgement/recognition/ support from Ministry of Education/School Support Services for the special characteristics of the in-depth work of the regional EfS coordinators promoting quality teaching and learning in schools and kura	5	10	1	4
Support	To have more support for Māori pedagogy and understanding of EfS in each region to support kura and mainstream education	5	9	2	4
Support	To build the EfS team's own content and pedagogical knowledge	13	3	1	3

Regional-level practices and their perceived effectiveness

The primary role of the regional EfS “team” (in some cases one individual) within each School Support Service is to provide EfS professional development opportunities for teachers and to support professional learning communities within, between and beyond schools. We now look at how they do that, and, in their own estimation, how *well* they do these things.

Survey responses indicated the advisors had worked with between six and 40 schools over the past two years. Five advisors had worked with primary-level only, five with secondary level only and 15 with both primary- and secondary-level teachers. Of those, many had worked with more primary schools than secondary schools.

What regional advisors do

The 2007 survey asked EfS advisors to estimate the proportion of schools in which they carried out a range of specific roles. Looking at the most frequent practices, at least half of the advisors said they did the following with *all* the schools they work with:

- Share resources about EfS.³³
- Provide environmental content knowledge.
- Provide pedagogical ideas for teaching processes.
- Provide wider sustainability content knowledge (primary only³⁴).
- Work one-on-one with a teacher (secondary only).

In terms of least frequent practices, at least half of the advisors only do the following with *half or fewer* of the schools they work with:

- Support the collection of EfS-relevant data.
- Support the analysis of EfS-relevant data.
- Provide suggestions for EfS-relevant assessment (primary only).
- Teach practical environmental skills to teachers (secondary only).
- Provide advice to help design course/class/activity (secondary only).
- Support teacher learning communities between different schools (secondary only).

Supporting the national pattern we again see indications that it has been a particular challenge to build an evaluative, data-informed culture as part of EfS professional development. Somewhere in between the most and least frequent practices was work to:

- support teacher learning communities within schools
- provide advice about integrating the curriculum.

Preferred and actual interactions with teachers and schools

Many advisors discussed their preference for a whole-school approach to EfS because this was seen as more effective for achieving EfS intentions, as echoed in the EfS literature (Tilbury & Wortman, 2005). Such an approach involves working with a wide range of people, hopefully including senior management, teachers, students (often in a modelling capacity) and community partners. For example:

I work with the principal and curriculum leader initially to see their vision—then we put together a draft plan and a Memorandum of Understanding. The key is working with teachers to plan units of work, then to go into the class with the teacher. Later there's reflective review and [setting up] next steps. It seems to work well because often schools know what they want to do. It's about building relationships with teachers and getting into their class to see how dynamics are working. It's very exciting when you work

³³ At least half of the advisors use the following regularly: Environmental Education Guidelines; EnviroSchools Kit; own self-developed resources; people in the EfS community; other websites; and resources from other sources.

³⁴ "Primary only" means that at least half of primary advisors do this with all schools, but less than half of secondary advisors do (which we class as "somewhere in between"). This rule can be applied to other bullet points.

with a school over the year because you get to know them and the kids and you can do something tailored for them. (Adviser)

However, the data in the next table, taken from the 2008 teacher surveys, strongly suggest that schools weren't always willing or able to embark with this level of commitment. It seems that advisors often end up working with either one or a subset of teachers in a school. They are often seen as the "passionate people" with a prior interest in environmental issues and/or quality teaching and learning.

Table 11: Teaching staff involved in NEfS professional development in past two years

	Primary schools % (n=74)	Secondary schools % (n=29)
One teacher	31.1	44.8
Some teachers	37.8	44.8
All teachers	25.7	3.5
No response	5.4	6.9

Half the respondents who said all teachers were involved in professional development came from the smallest schools (rolls of under 100 students) and nearly half the respondents who said that only one teacher was involved came from schools with rolls of 500 or more students. This pattern highlights a tricky contextual challenge for EfS, with its aim of achieving whole-school change. Smaller schools may well find it easier to achieve transformative change given the necessary visionary leadership.³⁵

Engaging senior management was seen as a major lever for good EfS, but one that, according to EfS advisors, could not always be achieved. Half of the primary school teacher respondents, but only a small number of secondary respondents, suggested that an EfS adviser had worked with their school's principal. EfS advisors were reported to have worked with caretaker and board of trustees in less than 5 percent of the schools.

Making the best of these challenges to their preferred ways of working, advisors have developed a range of workshops and workshop programmes, sometimes in collaboration with these other EfS providers or School Support Services advisors from other curriculum areas, to work flexibly with clusters of teachers. For example, one adviser explained that their region runs a "lead teacher programme", and a "whole-school programme", both of which involve participants setting up their goals and moving towards these with the aid of workshops and other support over the year. This region also offers one-off workshops, several of which were in the pipeline in late 2007. These included workshops with a focus on EfS achievement standards and cross-curricular contexts such as "EfS and literacy" and "EfS and drama" co-facilitated with School Support Services advisors in related curriculum areas. Another adviser discussed the pros and cons of workshops versus one-on-one work with schools, noting that the best approach depends on context and purpose:

In the workshops you are working with a group of teachers. You don't necessarily know their needs so have to decide purpose and activities ahead ... When you go into school you spend time working with where they are, what their background is and what they want to do. (Adviser)

Acting as connectors

Several other features of regional advisors' practices are worthy of particular note because they highlight the interconnections supported by their practice:

³⁵ Recall that 15 of the 17 responding principals came from very small schools.

- Advisors connect the professional learning of individual teachers with whole-school, school-cluster or even whole-community professional learning communities.
- Advisors connect with teachers from across all year levels (ie, Years 1–13) and from all learning areas.
- Advisors encourage teachers and schools to connect EfS with the national curriculum; for example, by approaching sustainability as a context for school-based curriculum development, which ideally connects up different learning areas.
- Advisors support teachers to connect a curriculum focus on sustainability with pedagogies that are underpinned by constructivist learning theories.
- Advisors help to connect teachers and schools with EfS resources/providers/experts and their local communities.

As illustrated earlier in this chapter, most EfS advisors said that they had an excellent or good relationship with Enviroschools facilitators. Reflecting the concern for holistic models of change, good relationships were also established with providers of a range of complementary programmes in schools; for example, healthy eating and peer support initiatives. Half the advisors said they had “excellent” or “good” working relationships with Mātauranga Taiao facilitators, the New Zealand Association for Environmental Education, EfS-promoting NGOs such as WWF, and local businesses. A wide range of other relationships were also acknowledged, with mentions including the clothing business Untouched World, local councils, TV3, the Department of Conservation, NIWA and city/district/regional councils.

Challenges for advisors’ practice

Part two of subquestion 2c asks about challenges to serving EfS intentions that advisors face. Table 12 documents these but also describes the strategies that they mentioned to sidestep or minimise these challenges.

Table 12: Challenges mentioned by advisors and their strategies used to meet them

Challenges faced	Strategies used
Lack of time or money, including no Teacher Participation Fund (improved in 2007)	Where available, using the Teacher Participation Fund in ways that best support teachers and schools to access professional development and further EfS
Lack of commitment or understanding from senior managers in schools	Working beyond the teaching staff; for example, with the principal, senior management team, board of trustees, etc
Teachers and schools that lack any understanding of EfS, and/or see it as an “add-on” or pay it “lip service”	Setting up visions and agreements with senior management, to help them understand the depth and extent of EfS possibilities
Inability to engage a “critical mass” of teachers to lead whole-school change and integrated curriculum planning	Being more discerning about the schools in which advisors will invest their time Putting a lot of adviser input into one school over an extended time period (sometimes for years)
Pedagogical practice is sometimes far behind what EfS demands; EfS requires a paradigm shift which is not easy to achieve	Balancing EfS content against teaching and learning processes (inquiry/action-based, student-led) where appropriate to engage different audiences
Competing pressures from “mandated” learning areas, and other professional development opportunities through School Support Services and other providers (links are not maximised)	Talking with other advisors in School Support Services to co-ordinate professional development better, and to better understand schools that other advisors have previously worked with (in terms of any noted strengths, challenges and visions)
Advisors experience work overload or a lack of time. Advisors are spread thinly across large geographic areas, and do not necessarily have a lot of peer support	Modelling sustainability and EfS in their own work as a team and with schools; for example, share ownership, leadership and decision-making; work collaboratively across different people and discipline areas, etc

A consistent theme in the interviews was that it is important to work with where teachers and schools are at, while attempting to get as much commitment and change as possible. A possible strength in this approach is each adviser’s

practice might suit their local context and their own skill set; a possible weakness might be one of starting from the local context and so constantly “reinventing the wheel” rather than building cumulative practices across schools.

Data used to inform EfS advisors’ practice

Part of any School Support Services advisors’ role is to help schools gather and analyse data, including student achievement data, to inform their professional decision-making.³⁶ Advisors are also expected to use this and other data to develop case notes and evaluate the effectiveness of their practice in milestone reports for the Ministry of Education. All EfS advisors who responded to our interviews and survey listed a range of data sources used by themselves and the teachers they work with. Their responses included:

- administrative output data, such as contact hours, school numbers, workshop participants
- standard School Support Services evaluation questionnaires
- staff and student questionnaires on a range of EfS topics, including behaviour change, sustainability knowledge and student decision-making
- anecdotal and interview evidence from students and teachers
- samples of students’ work, including photographic evidence and scrapbooks of action
- samples of teachers’ work, such as learning journals, unit plans, etc
- classroom observations
- responses elicited by specific EfS tools, such as a “reflection/change wheel”
- environmental statistics on waste, energy, and water usage
- progress in Enviroschool Awards
- student assessment results, including in related learning areas such as science.

Table 13 shows how useful advisors found various reporting strategies for informing their practice. The ambivalent response in relation to regional milestone reports³⁷ potentially indicates differing expectations about the viability of quantitative and/or student assessment data for evaluating their effectiveness (we discuss this in more detail in Chapter 5). As noted above, a NEfS working group is dedicated to exploring data-gathering opportunities in more depth.³⁸

Table 13: EfS advisors’ rating of how useful their data and reporting strategies are for informing their advisory practice

	Very useful (n=20)	Useful (n=20)	Slightly useful (n=20)	Unsure/ No response (n=20)
Data you personally collect	4	11	2	3
Data schools you work with collect	3	4	3	10
Regional milestone reports	-	5	10	5
Other reporting you do at a regional level	2	2	4	12
Reporting you do at a national level	1	6	6	7

No adviser indicated that they found any of the above “not useful”.

³⁶ We discuss data used to evaluate student outcomes further in Chapter 7.

³⁷ One interviewee found oral milestone reporting the most useful because it enabled a two-way conversation and immediate feedback from the Ministry of Education.

³⁸ Several NEfS advisors have also been part of additional contracts developing approaches to student and school EfS data, including NCEA achievement standards contract and a TLRI action research contract.

Bringing it all together: Case studies of practice

This chapter paints a picture of flexible practice, as responsive to the needs of individual schools and teachers as circumstances allow. While different types of support are outlined separately above, in reality a number of these processes may come together in the support provided to any one school. Illustrating this more holistic picture, we end this section not with a summary³⁹ but with two rich snapshots of practice in the case study schools.

The secondary school case study

The secondary school had access to several years of support from at least one NEfS provider. Over the past couple of years, the support had started to gain more traction and involve a greater number of teachers and school leaders. Several staff had recently formed an EfS group, including faculty representatives and nonteaching staff. The EfS adviser met with the lead teacher and assistant principal occasionally, and attended the EfS group meetings where possible to provide guidance, mentoring and challenges. Two teachers had also attended a two-day NEfS workshop, and were receiving follow-up email and in-person support for developing new units and courses with EfS contexts. Another teacher received individual support for developing a new course using the new EfS Achievement Standards. The adviser proactively and reactively provided suggestions, resources and contacts/opportunities. The adviser had supported the EfS lead teacher to facilitate an EfS whole-school professional development session, which ended with each faculty starting to develop a set of EfS goals. The school was also an EnviroSchool, which was used to provide an awards framework and some co-curricular opportunities for students rather than professional development support for teachers.

The following interview excerpt helps to illustrate the interaction between this more intensive in-school activity and an external workshop attended by multiple schools:

I did some [NEfS] professional development early in the year. It was two separate days with work in between ... At that point it was the most important professional development I had been on in my life. They asked for two teachers from here. Basically they talked about what sustainability is with all different people, from principals to [junior teachers]. We did some generic sustainability stuff—what is it, how does it fit into schools, what focus are we trying to bring (like it's more than just recycling), how does it fit with the new curriculum. They also went through the new EfS Standards and showed how they could be used in all schools and could be integrated into any programme. Then we had to go away and put it into practice. [Since then I have developed a new unit plan and workbook for students.] (Technology teacher, secondary case study)

³⁹ An overall evaluative summary of how well the regional advisors met their outcomes will be presented after all the schools' evidence has been described and discussed.

Primary school case study

Being an Enviroschool was more central to the narrative of the case study primary school. The school had received 40 hours of Enviroschools facilitator support. They saw EfS advisors as contributing to this journey, with greater time restrictions. The EfS adviser had co-facilitated full staff workshops with the Enviroschools facilitator, beyond which the school was “back in the hands of School Support Services” since, as the principal said, “Sometimes it’s hard to sustain when you’re doing something a little different.”

Since Enviroschools facilitation had ended, support from NEfS mainly included facilitated local cluster meetings, as well as one-on-one support for the EfS lead teachers to help them continue whole-school developments and locate further networking opportunities. The EfS adviser occasionally attended the school’s staff meetings to answer questions about EfS and curriculum integration/development and had recently (co)run whole-school professional development on the key competencies.

The following interview excerpt helps to illustrate the processes EfS advisors used:

The [the EfS adviser] has come to whole-school staff meetings, and co-ran a teacher only day [which was possible] since we’ve got a supportive principal. The cluster groups [NEfS facilitate] are pretty awesome ... At cluster meetings it helps you see where you’re at and get new ideas. We use the model of training a couple of people and those teachers share the message with others. (EfS lead teacher, primary school)

5. School participants' perceptions of regional EfS practice and its usefulness

The chapter complements Chapter 4 and addresses the same evaluation questions, this time from the perspectives of school participants. Professional development evaluation theory, such as advocated by Guskey (2000), suggests that if teachers react positively to a professional learning opportunity, they are more likely to follow through on the further thinking and action that it calls for. The findings of this chapter specifically address two of Guskey's five evaluation stages, as outlined in Chapter 2. The focus is on teachers' reactions to the professional development, and their views of the support for change provided by the resources available to them. The other stages—what they learnt, did differently and what changed in terms of student outcomes—will be addressed in Chapters 6 and 7.

To set what follows in context, Table 14 provides a quick overview of the breadth of NEfS contact with the survey schools.

Table 14: Nature of advisory contact with responding schools

Schools	<ul style="list-style-type: none"> • 300 schools received support from the EfS advisors in the past two years • 103 schools returned a survey that was designed for their EfS lead teacher (74 from primary schools and 29 from secondary schools)
Extent of NEfS support and EfS development	<ul style="list-style-type: none"> • Two-fifths of the schools had been doing some form of sustainability or environmental education for less than two years, two-fifths for between two and five years and a fifth for greater than five years • Most schools (at least one teacher) had received less than three years of support from EfS advisors⁴⁰ • 63 percent had also received some form of support from Enviroschools and 35 percent from another EfS provider or programme⁴¹

School participants' reactions to EfS professional development

We look first at teachers' perceptions of the effectiveness of the advisors' practice, and the usefulness of different types of learning opportunities and resources. The overall picture is one of a high regard for advisors' work and expertise, with some interesting indications of the tensions that are entailed in attempts to achieve profound transformations of long-established practice. Following that, challenges to advisors' work are outlined, as seen through the school participants' eyes.

The effectiveness of the advisors

Figure 3 shows that teachers who responded to the survey saw EfS advisors as effective, organised and collaborative facilitators who have a more than adequate grasp on sustainability, schools and curriculum.

Note that this and subsequent figures for school survey data rank items by the average level of response of the primary school participants. There were fewer secondary school respondents, so their percentages need to be interpreted with care.

Unlike some of the subsequent data sets, there is a notable level of accord between the opinions of the primary and secondary school respondents to this item set. Note also that we found no significant differences by school size.

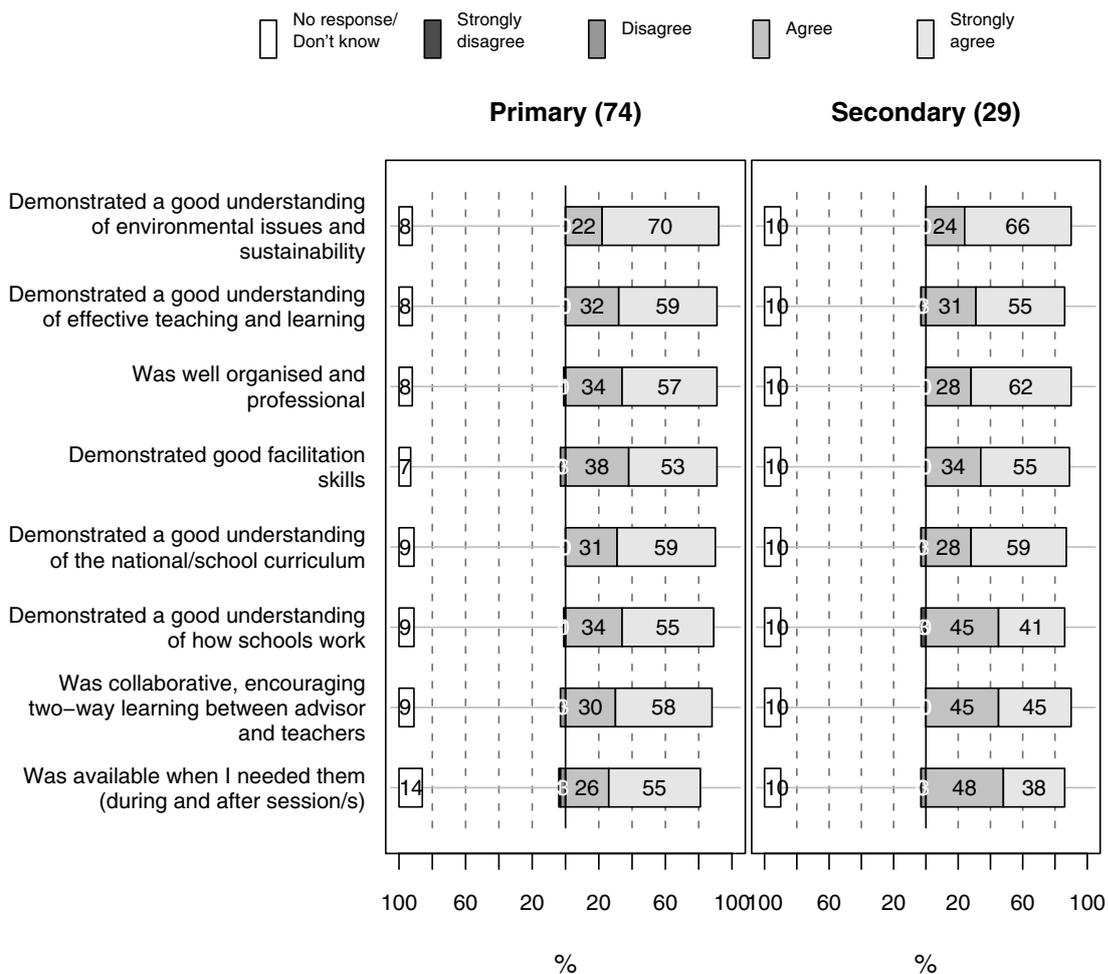
⁴⁰ 17 percent for less than a year, 48 percent for one to two years, 17 percent for three to four years and 8 percent for five or more years.

⁴¹ Including the Department of Conservation, a regional or city council and community environmental bodies.

Notwithstanding the contextual challenges discussed elsewhere in the report, being in a bigger school did not appear to impact on the regard in which respondents help the advisors’ work.

The strong recognition that advisors aim for collaborative two-way learning, notwithstanding their acknowledged high levels of existing knowledge, is especially encouraging. Such co-learning is held in high regard within the EfS field, partly because it models the learning that can happen between teacher and student.⁴² It also echoes effective teaching pedagogy by involving teachers as inquirers, as modelled in *The New Zealand Curriculum* (Ministry of Education, 2007a, p. 35).

Figure 3: School respondents’ impressions of EfS advisors’ practice



The usefulness of different types of professional learning opportunities

Four general types of professional development offered by EfS advisors are compared in Table 15. The table indicates the percentage of respondents who had taken part in each type of professional development. Where a teacher indicated they had taken part, we also noted if they had found this category “very useful”. The mean score for each professional development category (calculated but not recorded here) suggested that on average people find NEfS professional development to sit between useful and very useful.

⁴² For example, the NEfS *Strategy* states that, in line with an ecological change management process, advisory work “should be viewed as a dynamic process that allows knowledge to evolve through experience and engagement. Thus it is dynamic, open to negotiation and change, collaborative and responsive to the views of all involved” (p. 18).

Whole-school professional learning was much more common in primary schools (not necessarily just because they tend to be smaller—size was not a significant difference here), but the most commonly experienced learning for both primary and secondary school respondents took place in cross-school clusters.

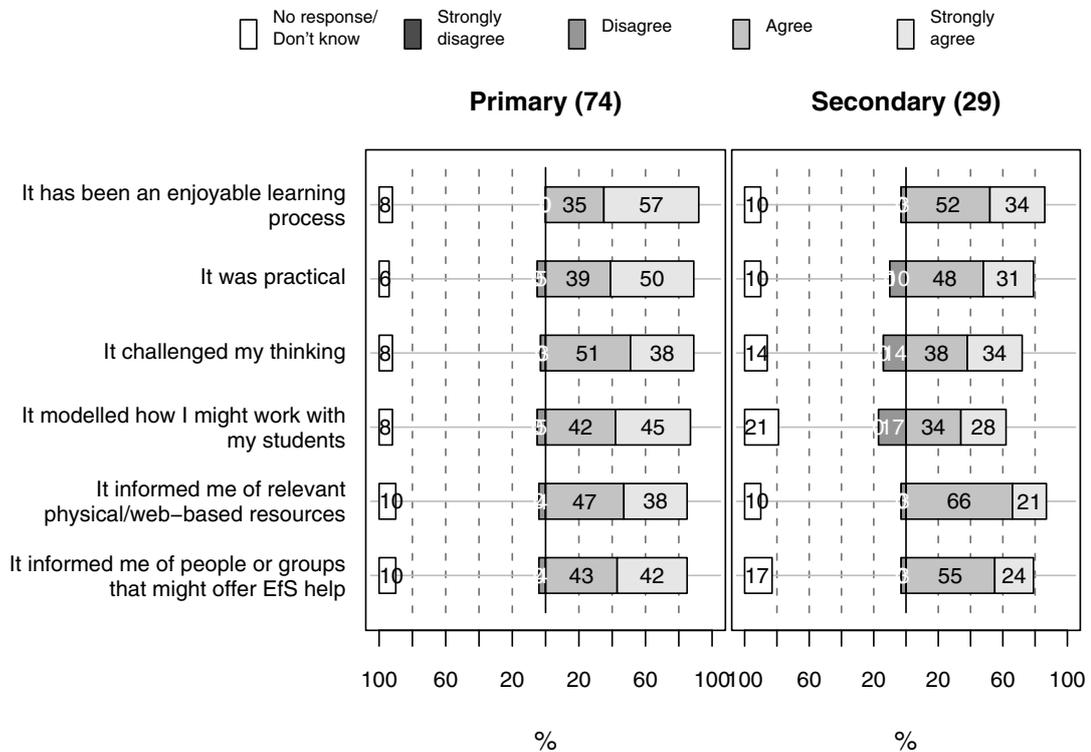
Table 15: School respondents' patterns of involvement and perceptions of usefulness of NEfS professional development

	Primary respondents		Secondary respondents	
	Involved % (n=74)	Involved and found very useful %	Involved % (n=29)	Involved and found very useful %
Professional development for a region/cluster, attended by staff from a range of schools	75.7	60.7	82.8	41.7
Professional development for a school, attended by several staff within the school	60.8	57.8	31.0	22.2
Individual one-on-one professional development/support for respondent	55.7	60.7	58.6	64.7
Other* School Support Services EfS professional development	33.8	48.0	20.7	83.3

* Other support recorded included: working with students; resource provision; emails; and school visits to check progress.

Figure 4 now presents responses to a series of items that asked respondents to rate their level of agreement with reasons that professional development could be experienced as useful and engaging. Again, patterns of responses are similar for primary and secondary participants and high levels of agreement are consistent with the positive regard in which EfS advisors are held.

Figure 4: School respondents' assessment of NEfS professional development



Notice that over a third of the secondary school respondents did not think that the professional development modelled how they could work with their own students, or did not answer this question. This is the highest level of negative/nil response to this set of items. Perhaps this was not the intention of the professional development they attended, or perhaps they did not find it to be immediately relevant to their subject area or struggled with the pedagogy. Details from two secondary school case study interviewees illustrate that there are likely to be different reasons for different teachers:

[The two-day workshop] was well run. The [EfS adviser] was wonderful. The other participants [from different learning areas] were really interesting. The facilitators taught using processes we could use in the classroom without it feeling like we were being treated like kids. Other professional development is usually where I sit and people talk at me. All I learn is that it wouldn't work for students. (Languages teacher, secondary case study)

[Some of the workshop activities] would turn a lot of mainstream teachers off ... like closing our eyes and reflecting. And doing activities with pictures [and] with paper and pens in groups. Teachers go to find how they can increase environmental issues in their subjects ... They want more of a lecture style. (EfS lead teacher, secondary individual interviewee)

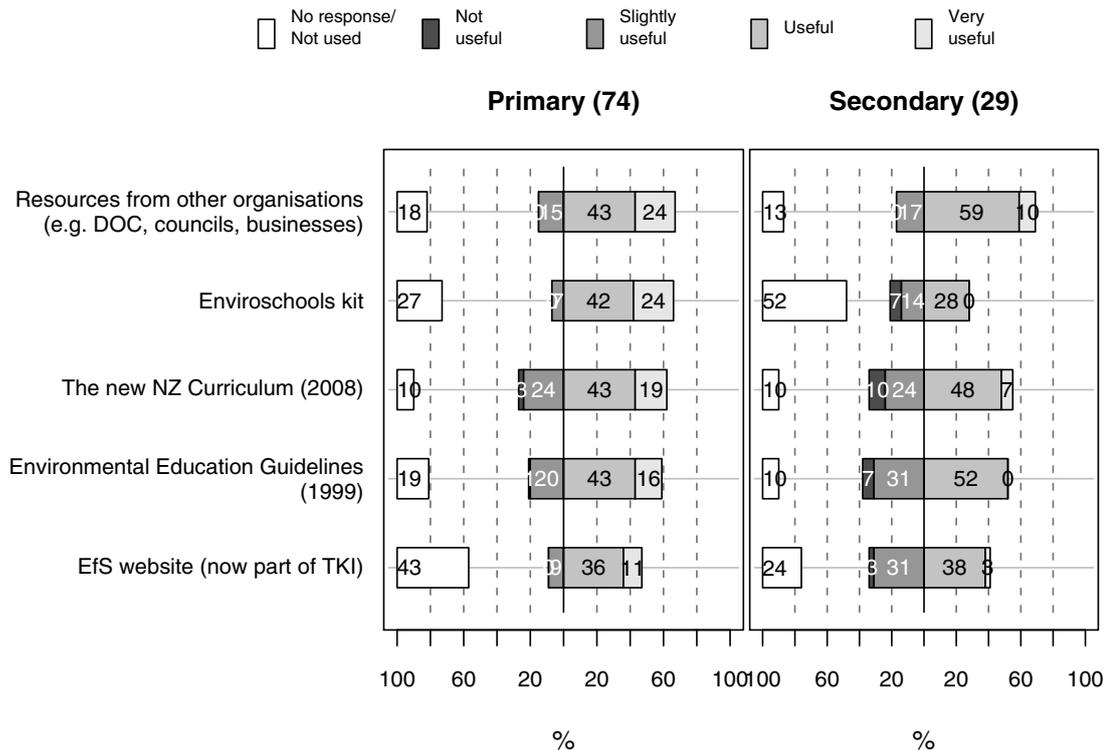
Opportunities to think deeply about personal theories are one of the hallmarks of professional development that leads to actual change, as identified by the recent Best Evidence Synthesis (Timperley et al., 2007). Research literature suggests that the difference of interpretation of an adviser's intent could be linked to each teacher's (probably tacit) theory of learning. If learning, and hence effective teaching, is seen as being primarily about efficient transfer of knowledge, then the second teacher's response makes sense. By contrast the first teacher recognises that the intent is not to treat teachers "like kids" but to model practice they could take up. This teacher experiences transfer of knowledge, which the second teacher wanted more of, as being "talked at" and seems to hold a view of learning that is more experiential. This small contrast illustrates the challenges that EfS advisors face when trying to help teachers challenge and shift their personal theories to aid transformative change.

The usefulness of resources

As noted in Chapter 4, the advisors draw on, and connect schools up with, a range of other EfS resources and expertise to serve EfS intentions:

We've got the Ministry of Education subject curriculum resources—because of the integrated nature of EfS learning we can link into them. Regional councils have amazing stuff online, for example *Life's a Beach*. There's a [local lakes] resource, Wastebusters, etc. Any of the regional council websites have lots of materials for students and teachers, and [they have] people resources. (Adviser)

Figure 5 shows that EfS lead teachers find some of these resources more useful than others.

Figure 5: School respondents' experience of the usefulness of EfS resources

A dedicated EfS website is now part of TKI (<http://efs.tki.org.nz>) but was not at the time of the survey. Open comments showed that some interview and survey respondents hoped for more school-based documents, possibly from the Ministry of Education.

Opportunities and challenges for change

EfS advisors are part of a system of change that relies on—and engenders—the support of other people and processes. While EfS advisors are pivotal to leading and supporting change they must work in collaboration with the school and all the particularities of its context. Accordingly, it is important that we consider evaluation subquestion 2c part two (What factors/contexts particularly enable the ability for EfS advisors to serve EfS intentions?) through the eyes of the school participants.⁴³ We begin with indications of how EfS is embedded in schools (or not) then look at levels of support from others in the school and from the local community. The section concludes with a discussion of the impact of these varying support levels on the provision of resourcing for EfS work.

EfS in the wider school context

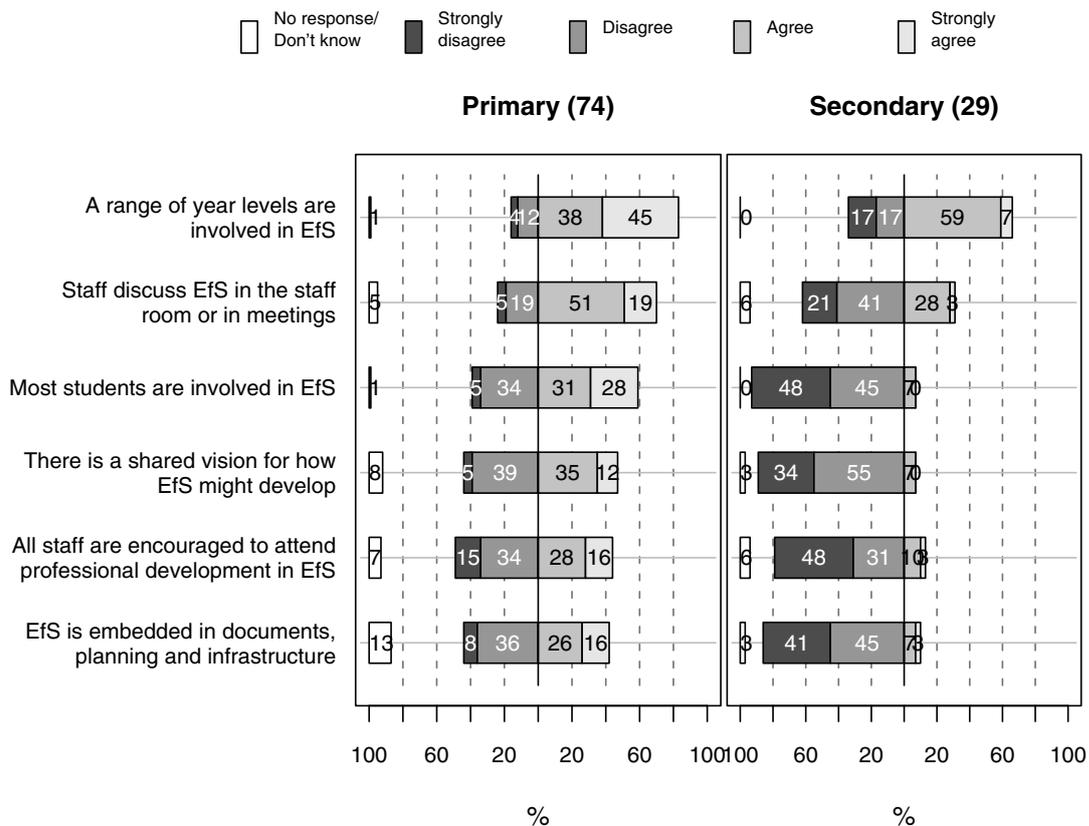
Figure 6 provides a picture of the extent and reach of EfS in the schools of the survey participants. Unlike some of the earlier graphs, primary/secondary differences are clearly evident for most items, and many of these differences are correlated with school size. For example, “all staff” were encouraged to attend EfS professional development in 44 percent of primary schools but just 10 percent of secondary schools. Not surprisingly, the smaller the school, the more likely this was to happen. (Also congruent with this pattern, 30 percent of primary and 45 percent of secondary respondents said they were the only teacher in their school involved in NEfS professional development.)

⁴³ Challenges perceived by the EfS advisors were presented in Chapter 4.

Involvement of most students, across a range of year levels, is again more likely in the smaller schools. While students from a range of year levels may be involved in EfS in secondary schools, they are likely to be few in number relative to the school population. This points to a pattern of selective involvement of a few classes.

There are indications that EfS discussions are more widely shared in primary staff rooms, and that in around half of the primary respondents' schools there is at least an attempt at whole-school changes in practice (most students are involved, shared vision for development). Embedding EfS in the planning infrastructure was underway in just under half the primary schools but the possibility of doing so appeared to have barely registered in secondary schools. Again, all these things were more likely to happen in the smallest schools.

Figure 6: School respondents' perceptions of EfS in the school context



Support for EfS in the school and local community

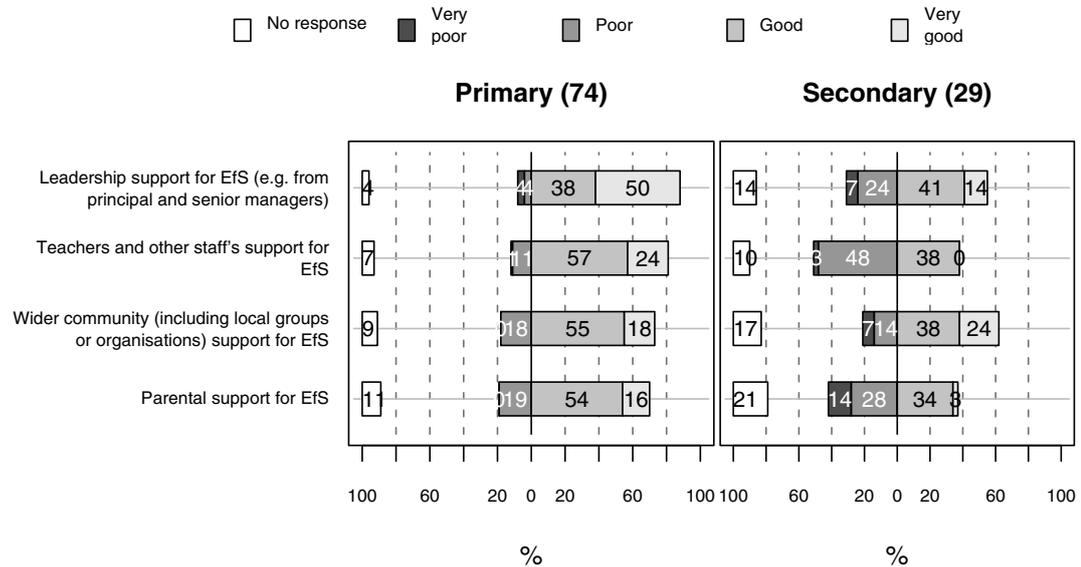
Organisational support helps teachers to translate professional development into practice (Guskey, 2000) but how well supported did the survey respondents feel?

Figure 7 shows that at least 70 percent of primary respondents felt that EfS development in their school received “good” or “very good” support across all groups, and especially from their own school leaders. The patterns here suggest that primary survey respondents came from schools that were reasonably supportive of EfS intentions.

Secondary participants appeared to be less likely to enjoy support for their efforts inside the school, especially about other teaching staff, or from parents. Higher levels of community support could relate to the actual initiatives in which they were involved. This pattern of responses is congruent with their perception that their vision of EfS is not shared by other staff, nor have other teachers experienced EfS professional development (see Figure 6 above). Just over half of the secondary respondents felt they had the support of the school’s senior leaders—which means that nearly half did not. In

combination with the data in Figure 6, the picture here is of dedicated teachers battling on, which makes the help and support of their EfS adviser all the more critical.

Figure 7: School respondents' rating of EfS development support from key groups



It is known to be more difficult to establish successful cross-curricular professional learning communities at secondary level (Stoll & Louis, 2007; Timperley et al., 2007). Indeed, data presented throughout this chapter and the next suggest that it is a particular challenge for EfS advisors to implement highly valued whole-school professional development that meets EfS intentions at secondary level, not least because these tend to be larger schools. Some of the constraints mentioned by EfS advisors include: subject-based teaching informed by assessment demands; department silos; 50-minute timetables; larger schools making whole-school change more difficult; less supportive senior management, etc.

Comments from school leaders in both the primary and secondary case studies show how leadership support, including principals' engagement with the EfS advisors, can play a critical role in EfS development:

[For me the biggest change from working with our EfS adviser is] having a conscience. You can have staff who are passionate, but the connection we have [with NEfS] makes me feel accountable. (Assistant principal, secondary case study)

I give EfS prominence in staff meetings, and it's an open agenda. At least once a term I'm available to release [EfS lead teacher] for the Envirogroup. There is also an appraisal process around EfS, so it's quite formalised—we take it seriously. It's an expectation for every class. (Principal, primary case study)

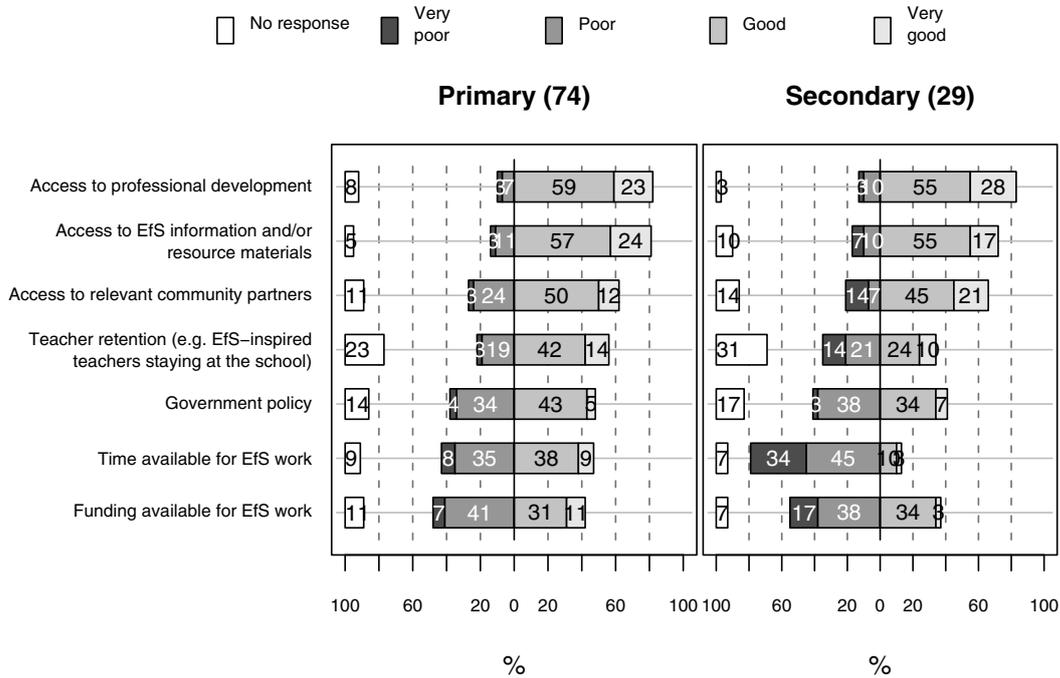
We also asked survey respondents to consider the support they might get from a range of other places. This draws attention to the importance of resources, as discussed next.

Resources that support EfS

The response patterns in Figure 8 suggest that access to professional development is the least likely of all the items to be a barrier to implementation of an EfS initiative. This is in accord with the picture of flexible, innovative practice that emerged in the last chapter. Notwithstanding the time constraints they face, EfS advisors do appear to be reaching those

who want their help.⁴⁴ The greater impact of teachers moving on from secondary schools again supports the picture of a small number of dedicated teachers carrying on behalf of the whole school.

Figure 8: School respondents’ rating of resources that support EfS



An open question asked respondents, “What barriers (if any) have prevented your school from further developing EfS?” Of the 91 written responses, 51 cited a lack of time, 18 a lack of adequate funding, 16 competing requirements (such as other professional development and curriculum demands) and nine cited traditional school structures. Some examples coded under these areas include:

The huge workload involved with other subjects, topics and NCEA paperwork.

Probably time, teachers feel pretty overloaded with demands upon learning time (while I’m doing this [survey] I should be planning my reading, marking maths, posting national library books etc!).

The principal’s principles [are] money and time driven rather than sustainability driven. Having to train new staff—trying to train the caretaker.

Time! When working on other contracts, this is a big ask to sustain and do well continuously.

Overloaded curriculum, not all staff with an attitude for EfS to be an integrated priority.

The time it takes to apply for funding for projects. The workload, in general, is often huge!

At our school by the time you teach your core subjects it is difficult to do EE. Even when you integrate it, to do it well means either smaller classes or time off to organise and follow up.

⁴⁴ A caveat to this comment is that respondents were drawn from the EfS data base. We have no way of knowing how many teachers might want, but not yet have accessed, EfS advisory support.

Large school, rapid turnover of teachers. Caretaking staff very overstretched and short staffed ... Exams and assessments, short lesson times, changing classrooms, etc.

Time and money tend to be the most often cited barriers to any type of innovation (see, for example, NZCER's national surveys of both primary and secondary schools (Schagen & Hipkins, 2008)). Thus the perception of more participants that support in these areas is poor could be anticipated. Given competing demands for both time and money, this is a need that is unlikely ever to be satisfied, and creative solutions are needed here.

Factors associated with a context conducive to professional learning include time, active school leadership and consistency with policy trends (Timperley et al., 2007). Overall, this section suggests that these conditions are less likely to be achieved in secondary schools than in primary schools. However, the EfS advisors actively try to shift potential barriers, and appear to have succeeded in some cases:

For all barriers and frustrations that come with the job, some schools have made huge shifts in the way they teach. (Adviser)

Evidence of these shifts is the subject of Chapter 6.

Evaluating the overall effectiveness of NEfS processes

Chapters 4 and 5 paid particular attention to the “professional development” aspect of our analytic framework because the explicit focus on professional development for teachers in mainstream schools is a unique contribution that the NEfS initiative makes to education for sustainability.

We found that the processes EfS advisors use at a national and regional level, and teachers' perceptions of them, align well with effective professional learning as expressed in key literature. The structure of having both national and regional elements to the advisors' work appears to provide a meso-level conduit between the macro-policy environment discussed in Chapter 3 and the micro-environments of the different schools. This greatly enhances the possibilities for EfS synchronisation between levels of the education system (Fullan, 2003; Istance & Koboyashi, 2003).

The teachers in this study reacted very positively to advisors' skills, knowledge and processes/activities used to “deliver” professional development. All of this suggests they will be more likely to learn and make changes in their practice (Guskey, 2000). Almost all respondents saw the advisors as well informed and able to provide content knowledge and pedagogical expertise to inject new ideas and challenges, which is a key requirement of effective professional development (Timperley et al., 2007). In some contexts, particularly in the secondary sector, greater use of sustainability specialists could further assist teachers to build their content knowledge of this complex area.

The processes that advisors use to establish “learning communities” across schools, and also within schools where possible, are contributing towards creating shared understandings of practice, and in some cases to the “deprivatisation of practice” (Timperley, Phillips, & Wiseman, 2003) particularly where the adviser works alongside the teacher in the classroom or in planning processes. EfS advisors aim to support teachers to be inquirers and reflective practitioners, but undertaking “data-informed” inquiry is an issue because of the associated assessment challenges. In larger schools the preferred whole-school approach, where it is taken up, can connect up teachers from different year levels and learning areas. However, the evidence also strongly suggests that the bigger the school, the greater the challenges of whole-school alignment and change. This is an issue that could bear further, more explicit, investigation.

While they are willing to meet teachers' perceived learning needs by using any form of organisational processes that will work within the specific constraints of the context, the preferred advisory approach is to model collaborative knowledge generation by working with other EfS providers and supporting the establishment of spaces where school

staff can collaborate with each other and with others. This type of pedagogy is coherent with the types of change they are trying to bring about, and they use a variety of activities to involve teachers as learners. Again, these practices are known to be effective in challenging teachers' thinking (Timperley et al., 2007).

The evaluation was asked to address the factors and contexts that appear to challenge the ability of EfS advisors to serve EfS intentions. While the "usual suspects" (time, resources) were in evidence, we see these as surface-level manifestations of much deeper challenges. In any case the advisors are committed, resourceful and energetic in overcoming the barriers these pose.⁴⁵ Of greater potential import here is that advisors are trying to establish the kinds of professional learning communities which have been shown to be the most demanding, particularly the establishment of professional learning communities within secondary schools (which is at least in part rated to their size) and wider learning communities that link teachers and other school staff to interested others in the wider community. Sustaining such professional learning communities is known to be challenging (Stoll & Louis, 2007).

⁴⁵ With the caveat, discussed in Chapter 3, that some of them are stretching themselves over too much work for the time available.

6. What changed for schools and teachers?

This chapter continues the reporting of findings that inform the second research question for the overall evaluation. The focus of this question is on various aspects of achieving EfS goals in schools. This chapter draws on the systems thinking/change, transformational teaching and learning, and cultural interfaces aspects of our evaluation's analytic framework as we begin to address evaluation subquestion 2e, as summarised in the Table 16.⁴⁶

Table 16: How Q2d was adapted for the NEfS initiative in particular

Main evaluation question (Q2)	Question and subquestions adapted to NEfS
How effective are the three initiatives in "operationalising" EfS key messages and achieving EfS goals in schools?	How effective are the NEfS Advisory Service's operational practices at supporting EfS in schools, and what has it achieved in relation to EfS intentions expressed in Chapter 3?
Main evaluation subquestion (2d)	
(d) To what extent do the EfS initiatives impact on: students' learning opportunities, understanding and assessment of student learning outcomes in EfS; teaching practices, including pedagogical change; school-wide structures and curriculum development; and community partnerships and sustainability?	To what extent does the NEfS Advisory Service (sometimes in collaboration with other EfS providers) impact on: <ul style="list-style-type: none"> • teaching practices • curriculum development • school-wide changes, including community partnerships • students' learning outcomes?

In this chapter, the findings are presented from the perspective of Guskey's (2000) evaluation framework. We discuss what the participants said they learnt and the extent to which these new insights made a difference to their practice and to school structures. Indicators they saw of changes in student outcomes are discussed in Chapter 7. The data are presented as if events unfolded in this linear logic of learning first and change second, but the summary at the end of these two chapters uses the analytic framework to draw the component parts into a more holistic picture of a web of changes. We draw the evidence together with reference to advisors' contractual outcomes in Chapter 8.

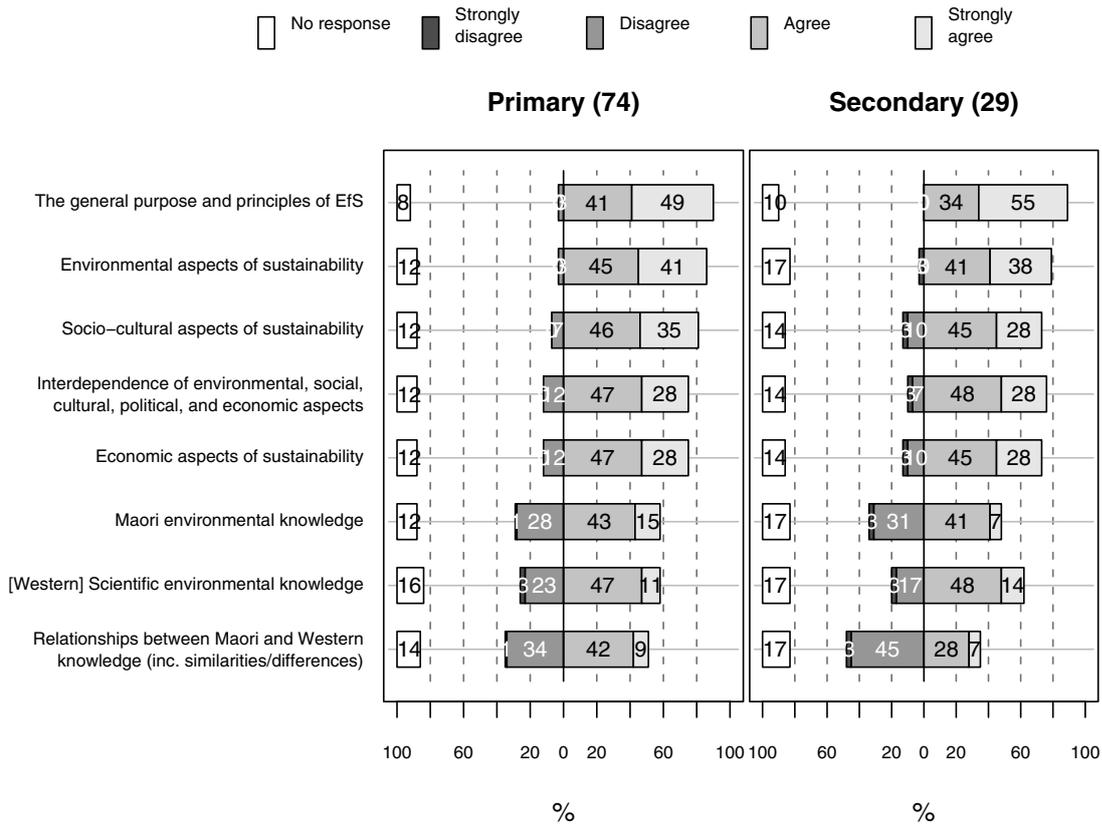
What participants said they learnt

We asked survey respondents about the extent to which they agreed that being involved in EfS professional development had helped them better understand a range of relevant concepts—in other words, the extent to which their curriculum knowledge had been strengthened. The results are shown in Figure 9. Taken together they are evidence that NEfS professional development has increased teachers' understanding of the holistic, interdependent, multifaceted and sometimes contested nature of sustainability. NEfS professional development helped more than three-quarters of the participants, at both levels of schooling, improve their understanding of environmental and sociocultural aspects better than economic aspects of sustainability.⁴⁷ However, further work appears to be needed in developing understanding of Western scientific and Māori knowledge of the environment and the relationship between these. This is congruent with the findings in Chapter 3 where we identified a need for greater guidance in this area.

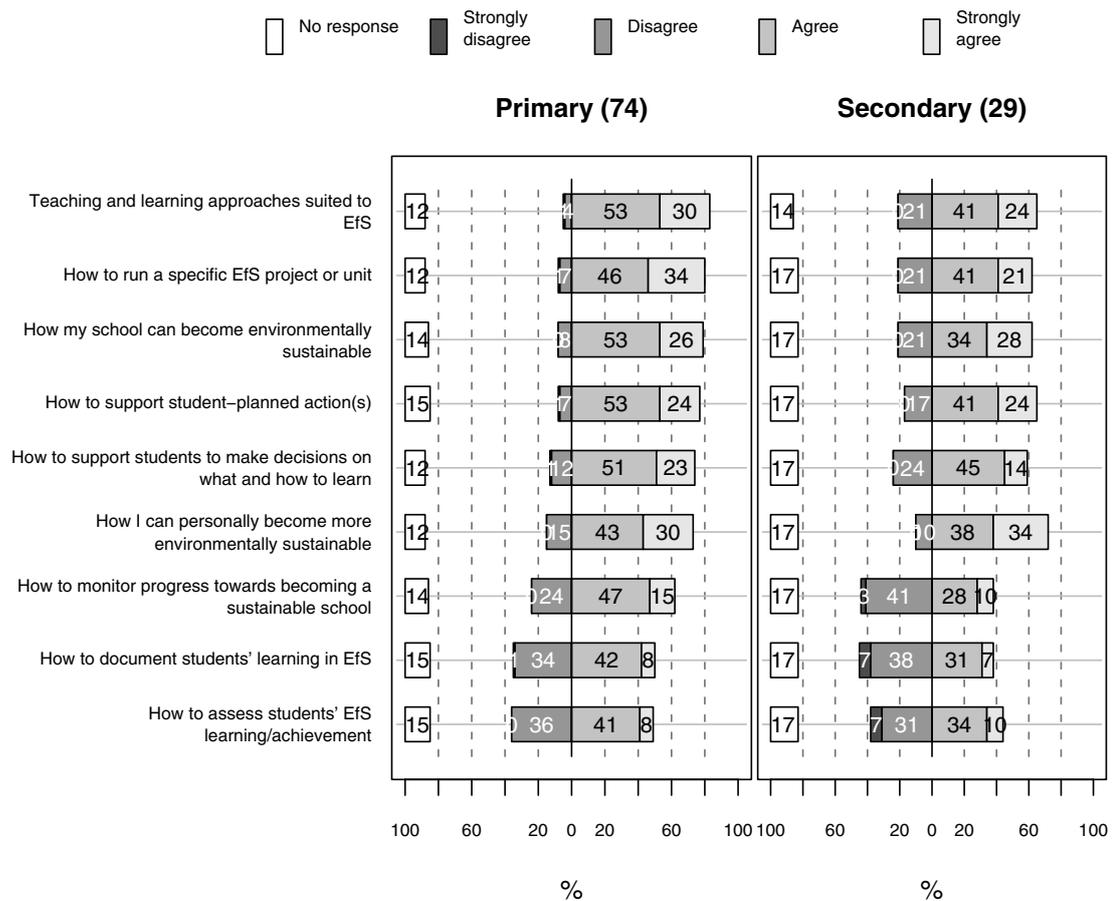
⁴⁶ Students' learning opportunities, outcomes and assessment will be addressed in Chapter 7.

⁴⁷ These findings echo EfS advisors' self-reports of their own understanding in these areas—slightly more EfS advisors claimed to have a better understanding of environmental aspects than other aspects of sustainability.

Figure 9: Extent to which school respondents enhanced their sustainability knowledge



As well as curriculum content teachers need to know how best to teach what they wish to teach—what might be called pedagogical content knowledge or PCK. Figure 10 shows the extent to which survey respondents perceived that being involved in EfS professional development had increased their knowledge of a range of relevant actions and pedagogies. The pattern suggests that both primary and secondary participants valued their new learning in a range of relevant “how to...” areas of practice. Again, however, we see evidence of the impact of a tension first discussed in Chapter 3. There were much lower levels of agreement that the professional learning has helped participants gain a better understanding of how they might approach assessment and accountability imperatives.

Figure 10: Extent to which participants increased their PCK and practical knowledge

Changes made to teaching practice

The interviews we conducted with Efs advisors and school staff suggested that Efs is inseparable from facilitative pedagogies. Case study teachers described the way that bringing in Efs had led them to strengthen their teaching in ways that appeared to move them closer to the seven aspects of effective teaching pedagogy outlined in *The New Zealand Curriculum*⁴⁸ (Ministry of Education, 2007a). Such shifts align well with the teaching elements associated with transformational learning and systems thinking referred to in our analytic framework (we will expand on this in the “student learning opportunities” subsection below). For example, teachers from the case study primary schools spoke of using inquiry learning approaches within meaningful contexts to encourage students to become creative thinkers and innovative actors. Secondary teachers said that Efs had helped them better share decision-making with their students. They suggested that learning had become more personalised to students’ interests and prior experiences, thus calling for more just-in-time planning rather than predetermining learning tasks for the entire class:

Inquiry learning is a process of teaching, it’s more student centred ... [and] in some cases now the students are teaching us. We’re empowering them to be thinkers—it’s that social action side ... If there weren’t people doing that job [Efs advisors] it wouldn’t get deeper and deeper. We might still integrate and use inquiry but we’d miss the ‘So what?’ It provides a context instead of one-off topics. (Efs lead teacher, primary case study)

⁴⁸ These are: creating a supportive learning environment; encouraging reflective thought and action; enhancing the relevance of new learning; facilitating shared learning; making connections to prior experience; providing sufficient opportunities to learn; and teaching as inquiry.

I felt like I was a beginning teacher—things are happening and I’m suddenly planning around it. There’s lots more discussions in class. Generally I knew what I wanted to do, but now I’m having to go with the students more ... I have enjoyed teaching it more than [my other courses]. I always thought sustainability was just environmental but it’s not. It makes me want to expand. It’s completely changed my teaching for this subject. (Geography teacher, secondary case study)

As the next explanation shows, the process of developing EfS in a school can enable teachers—in collaboration with students—to become more confident inquirers into sustainability:

[The EfS adviser] is a coach on the side, a critical friend for the school who works with the lead teacher and senior management ... [They] work alongside a school’s facilitator with the staff—not take over and be the expert and tell the staff what to do, but [she] steps forward when needs be and then steps back. (Assistant principal, secondary case study)

All the primary and secondary survey respondents who answered the questions about the relationship between EfS and *The New Zealand Curriculum* thought that “EfS encourages effective teaching (eg, reflective teaching; teaching as inquiry)”. It is notable that this item received the strongest positive response from secondary respondents of any item in the survey, with 59 percent *strongly* agreeing this was the case.

Nearly two-thirds of the primary survey respondents (60 percent) and over half (55 percent) of the secondary respondents indicated that NEfS professional development had personally led them to “make changes to my teaching style”. About two-thirds of the teachers who provided further explanations as to why they may not have made a change suggested that their teaching approach already aligned with pedagogies valued by EfS (ie, change was not needed); the remaining third did not. Both possibilities are represented in these open responses:

We already have an inquiry-based learning approach embedded in our pedagogy, so the authentic real-life environmental approach to learning was not new. It fits in very well to our school philosophy. (Primary school survey respondent)

My teaching style hasn’t been changed. If I spent more time with an NEfS provider then maybe it would. (Primary school survey respondent)

Many survey respondents who said they had changed their teaching style described these changes in their own words. As indicated by the emphases of theoretical literature in the *EfS National Co-ordination Team Strategy* (Christchurch College of Education, 2006) we coded their responses as facilitative teaching practices that enable learning opportunities to be: student-centred with authentic; action-oriented; inquiry-based; experiential; shared decision-making and cross-cultural. The results are shown in Table 17.

Table 17: School respondents' self-reports of main teaching changes (n=32)

Code	No.	Examples
Authentic	11	I have become better at providing more authentic learning experiences through big ideas/key concepts in a variety of relevant contexts. I have incorporated a greater range of teaching approaches which have allowed the children to be involved in more hands-on and relevant experiences and given them the motivation to think of solutions and strategies to issues that they wish to focus on improving/changing. We have integrated students' interests into community/environment need.
Action-oriented	9	Developing action competence. Create understanding of direct and indirect action. Start with an issue, rather than study something then decide what will govern my "So what?" Provided the opportunity for children to take direct action and have more role in decision-making etc.
Inquiry-based	10	Relaxed about immersion in process and its value—stuff takes longer to set up ... but hopefully deeper learning. Developed a unique inquiry learning approach for our school.
Experiential	4	More practical and experiential activities. Have a go approach—let children explore and discover.
Shared decision-making	6	More student voice and choice in content of studies, and children making decisions about things that impact on the school. Giving students opportunities to investigate possibilities and to make decisions based on what they have learnt. Involving students in decision-making.
Cross-cultural	2	I am more passionate about teaching in, for and about the environment and the key concepts associated with these, especially in incorporating a Māori component.

These descriptions—and more detailed accounts from case study interviewees—match well with EfS pedagogy described by EfS advisors and reflected in EfS literature, as outlined in Chapter 3. While we cannot comment on the teaching pedagogies of teachers who were not surveyed, the response patterns across all the survey items suggest that NEfS professional development has encouraged a range of teachers to develop EfS practices and has contributed to greater collaboration between teachers (see Figure 12, later in this chapter).

Changes made to the school curriculum

Curriculum development involves increasing sustainability *content* while also using sustainability as a rich *context* for curriculum development. As will be discussed shortly, the two greatest impacts from NEfS support at the whole-school level were seen to be “increasing environmental/sustainability content in the school curriculum” and “designing units/projects around the unique needs/location of the school” (ie, curriculum context).

Seventy-five percent of secondary respondents and 85 percent of primary said that NEfS professional development had led them to increase sustainability content in their classes. Of the survey respondents who described some kind of curriculum change, one-third had designed a new EfS unit or course, and two-thirds had integrated EfS into current subjects and teaching units. The nature of these self-reported changes is illustrated in Table 18.

Table 18: School respondents' self-reports of curriculum changes (n=29)

Code	No.	Examples
EfS course/unit design	11	Whole-school unit based on environmental theme—with “active” outcomes. We have a unit in Year 10 on the environment. I have incorporated the Trees for Survival programme into a Year 12 unit. 1. Inquiry topics based on EfS using Enviroschool Kit activities. 2. Art in the Environment—murals painted by children for our school ...
EfS integration	20	I include EfS at every opportunity and am working to incorporate EfS in all my teaching units. In the classroom I have been able to integrate EfS in to all curriculum areas, which has made a huge impact on the children's learning. Included more environmental issues in lesson plans. I relate my teaching to the key dimensions, ie, Biodiversity, Interdependence, etc, much more. I am using action competence more in my teaching.

Some open-ended survey and case study responses also suggest that EfS can provide an umbrella for the design of a shared school curriculum. As Table 19 shows, 60 percent of primary schools and 21 percent of secondary schools included EfS as “an integrated theme across a syndicate or school”, although we suspect that a smaller proportion would have been developing EfS to integrate and connect up all learning areas across all year levels. EfS was fairly evenly spread across all primary learning areas, with slightly more schools involving science, and slightly less involving maths. Secondary schools were most likely to develop EfS as an extra/co-curricular activity/group, and/or include it in one or more learning area (most likely science and/or social studies).

Table 19: School respondents’ description of how EfS has developed in the school

	Primary respondents %	Secondary respondents %
As an extra/co-curricular activity or group	27.0	51.7
As a separate interdisciplinary EfS course, subject or module	10.8	17.2
As an integrated theme across syndicate or school	59.5	20.7
Included in all learning areas	20.3	0.0
Included in one or more (but not all learning areas)	50.0	51.7
<i>English or languages</i>	32.4	0.0
<i>Mathematics</i>	16.2	3.4
<i>Science</i>	43.2	34.5
<i>Technology</i>	29.7	3.4
<i>Social Sciences</i>	27.0	31.0
<i>Arts</i>	23.0	6.9
<i>Health and Physical Wellbeing</i>	24.3	0.0
<i>Other</i>	1.4	6.9

Insights from the case study schools

The secondary school case study gives an insight into how NEfS support through workshops and/or one-on-one planning support had enabled teachers to integrate a sustainability focus into a range of subjects, as well as develop a new subject. For example:

- A technology teacher had written a new unit for a class to explore product life cycles and the socially responsible business practices.
- A languages teacher had developed a new topic on food miles and advertising, and had “completely rethought” how she would teach the junior school programme the following year.
- An environmental studies teacher had used a focus on sustainability to “teach the research process”.
- Another teacher had developed a new course where students were supported to develop sustainability projects and actions and reflect on their process and the implications for a sustainable future using the EfS standards.

While, at this stage, EfS was being integrated into curriculum areas, rather than being an integrated learning area, one teacher could see new possibilities emerging:

[Usually] everybody shuts off into their own world but only when there is this communal ambition can we understand each other’s subjects. (Teacher, secondary case study)

The primary school case study provided an insight into the way in which a sustainability “future focus” can serve as an organising principle for developing a school’s curriculum, as is suggested by the School Curriculum Design and Review

section of *The New Zealand Curriculum* (Ministry of Education, 2007a). EfS had provided a focus for the school to flexibly design their entire curriculum according to the school's values, community interests and location. The school had set the theme of energy for the year, and teachers of each year level developed key inquiry questions each term for which students investigated and designed actions while meeting achievement objectives in each learning area. It has also helped teachers to "make sense" of other learning areas in which they had recently received professional development:

When we were doing the statistics project we collected all the lunch rubbish, and we graphed it, etc. ... We also designed a survey about school's entrance way and the students collated it... For ICT—what I've done is for their action project kids took photo of lunches, and did a letter home to parent. [Two teachers] presented to the ICT cluster using EfS and statistics ... With the ICT it's not my strength but [our sustainability focus] made me see how I can do it. (Lead teacher, primary case study school)

Alignment between sustainability and the national curriculum

All survey respondents and case study interviewees agreed or strongly agreed that EfS provides a means to meet the intentions of *The New Zealand Curriculum* (Ministry of Education, 2007), particularly its more transformational elements, including the vision, key competencies and future-focused issues.⁴⁹

The new curriculum really opens some doors to have all children educated in New Zealand about a sustainable and healthy environment. Let's really move it forward and make a tremendous, extraordinary difference to how our kids see the world! (School survey respondent)

Emphasis on the new curriculum is doing a lot [for EfS]. People need different pedagogies to move from 'teaching subjects' to 'teaching students'. (EfS lead teacher, secondary case study)

If [we] look at all the values and learning goals [of the curriculum] EfS sits hand in hand. It integrates so well it shouldn't be a separate subject, it should be a compulsory part of each department but then you can't force people. I would like to see all the subjects incorporating the model in all of their practices because it puts a real-world focus on their subjects and sustainability affects everybody. (Technology teacher, secondary case study)

Figure 11 shows strong unanimity among the survey participants for these views. Respondents saw the new curriculum as a key driver for EfS and—more obviously—EfS as a vehicle to deliver the new curriculum. In comparison to nearly every other area of the survey, this group of items gained the strongest positive response and least negative response overall. Unusually, secondary school respondents were as positive as primary. For example, 86 percent of both primary and secondary⁵⁰ survey respondents saw EfS to be relevant to the essence statements and achievement objectives of the learning areas they teach, and over a third strongly agreed that this was the case.

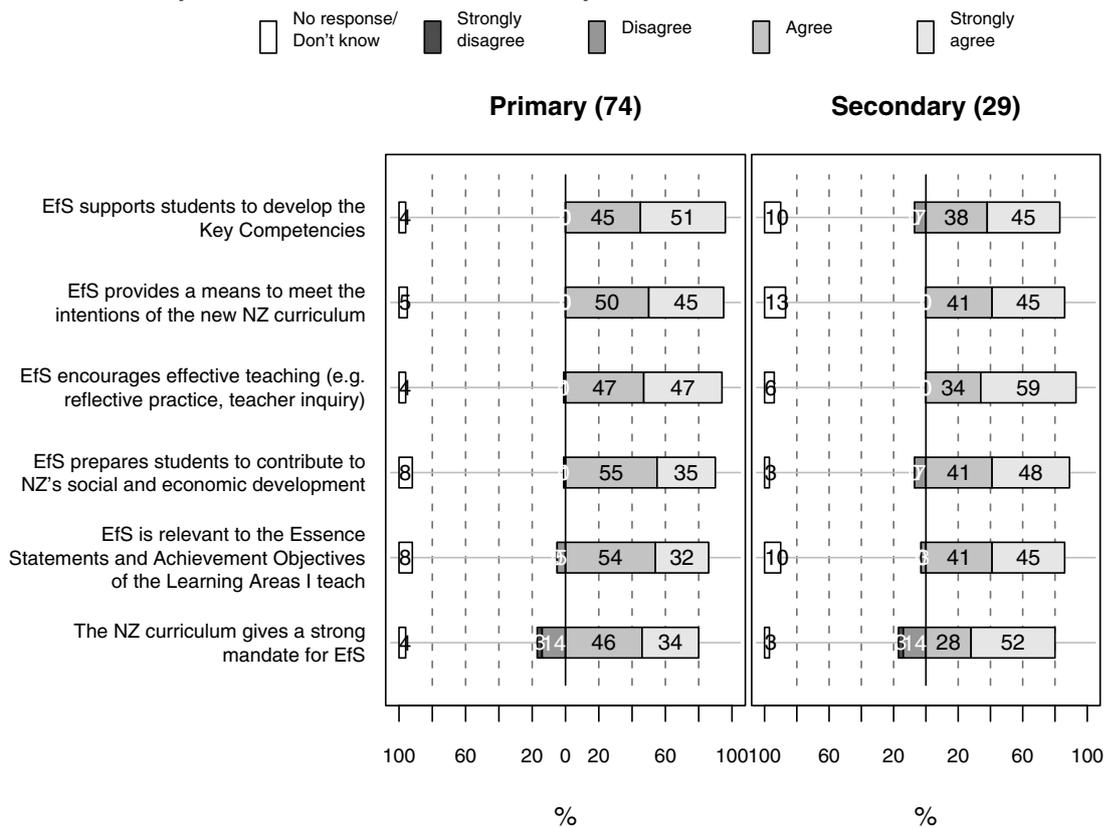
Note that the item that specifically asked whether *The New Zealand Curriculum* gives a strong mandate for EfS was rated slightly lower than the other items (with 17 percent disagreement). This suggests that school staff view EfS as

⁴⁹ The NEfS team also believes they are making good headway in maximising the synergistic relationship between EfS and the new curriculum. For example, most advisors indicated that they were making good progress on their Strategy Objective "to ensure EfS promotes the teaching and learning strategies that reflect the key competencies of the curriculum framework". This area was considered the furthest-equally well developed of all 12 NEfS Strategy Objectives.

⁵⁰ The secondary result here may partly reflect an overrepresentation of social studies and science teachers completing the survey, which is where EfS appears to be primarily developed at secondary level.

...serving the potential of the new curriculum slightly more than the new curriculum is seen to serve EfS.⁵¹ Perhaps this is because sustainability is encouraged rather than prescribed, and because some specific environmental/sustainability content has been lost from some learning areas in the move to a less content-driven curriculum. In fact, *The New Zealand Curriculum* does not prescribe content per se. Rather it is a framework to help schools develop a local curriculum relevant to the learning needs of their students. This could be disconcerting for those who expect to be directed as to what to teach and could be the reason that around a third of primary and half the secondary respondents said they did not find *The New Zealand Curriculum* to be a useful or very useful resource for developing EfS in their school/teaching (refer back to Chapter 5, Figure 5).

Figure 11: School respondents' views of the relationship between EfS and *The New Zealand Curriculum*



Changes made at the school-wide level

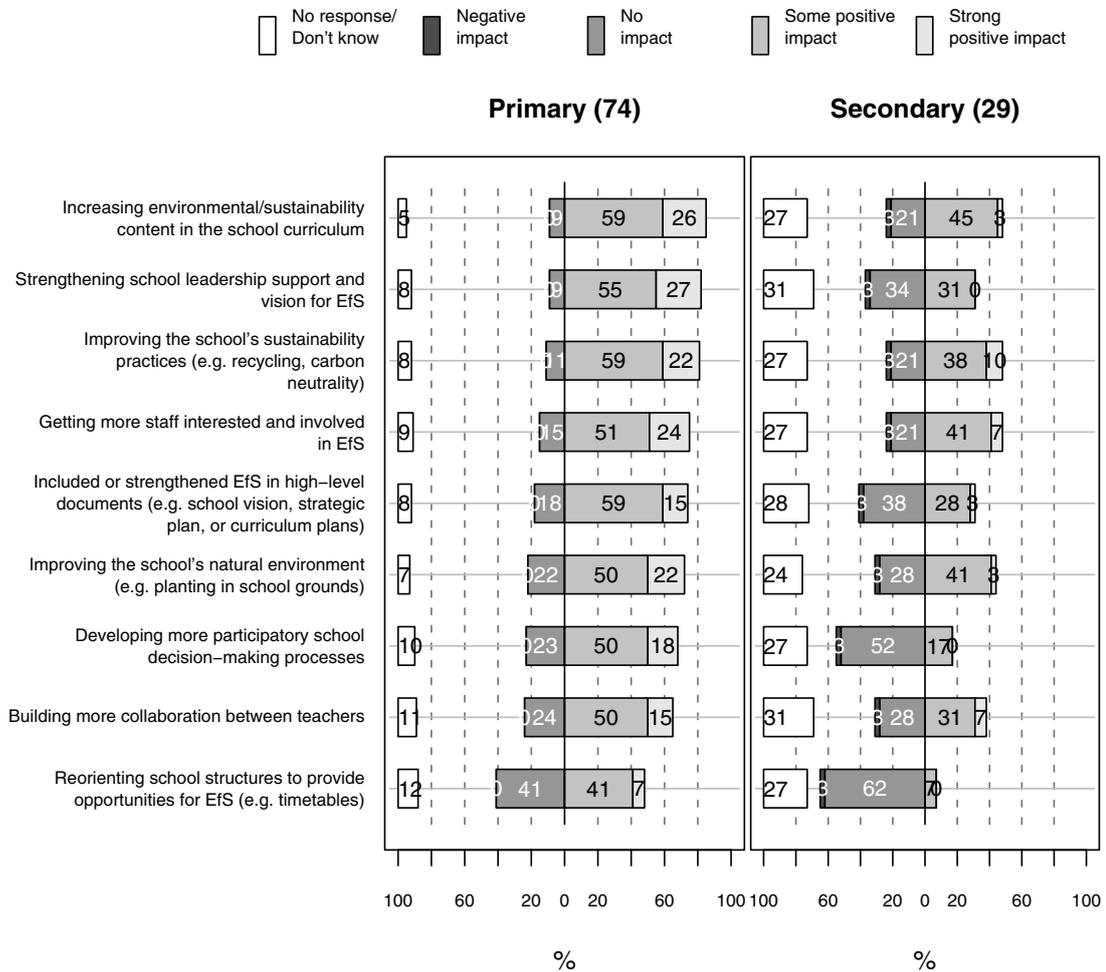
As we saw in Chapter 5, not all the students in a school will be taught by a teacher with an interest in EfS. This is particularly likely to be so in secondary school and raises the question of whether and how other students might experience learning that enhances their knowledge of and actions for sustainability. With this question in mind, we now look at school-wide impacts of involvement of school staff in EfS.

Congruent with the findings reported in Chapter 5, at least two-thirds of primary respondents indicated positive school-wide impacts from involvement in NEFS professional development. Figure 12 shows that these include some changes that may not impact on students directly (eg, strengthening EfS in high-level documents such as school vision/strategic

⁵¹ This message is echoed by EfS advisors' own ratings of progress on their NEFS Strategy Objective to strengthen the mandate for EfS in the New Zealand curriculum. Only four advisors thought that good progress had been made here, whereas seven thought slow/initial progress had been made, four thought no progress was being made and five did not respond.

plan) as well as some that will give students direct experience of taking action for sustainability (eg, recycling, planting in the school grounds). There is also evidence that NEfS has contributed to the development of a more participatory and collaborative decision-making culture in a majority of the primary schools.

Figure 12: School respondents' assessment of NEfS impact on school-level outcomes



The patchy pattern of change in secondary schools doubtless reflects the size-related difficulties documented in Chapter 5. Impacts were more likely to be reported in smaller schools (up to 300 students) for all of the following items: included or strengthened EfS in high-level documents (eg, school vision, strategic plan or curriculum plans); strengthening school leadership support and vision for EfS; developing more participatory school decision-making processes; reorienting school structures to provide opportunities for EfS (eg, timetables); and improving the school's sustainability practices (eg, recycling, carbon neutrality).

Secondary respondents have made better progress with sustainability practices (where an enthusiastic teacher could go ahead unilaterally or with the help of a small number of others) than on incorporating EfS principles into school-wide documents or decision-making, with the active support of the senior leadership of the school.

Chapter 5 reported data that show that in less than half the surveyed primary schools the staff commonly discuss EfS, feel encouraged to attend EfS professional development, hold a shared vision for how EfS might develop or have EfS embedded in documents, planning and infrastructure. The figure is much lower for secondary schools. Nevertheless,

where these practices are aligned, and there is support from senior leaders, everyone can experience learning benefits, as the following insights from the case studies illustrate:

We're working with the children to decide what is important, through the vision map. And I'm taking what comes from it to translate into goals for the year with [the EfS lead teacher]. My role is to support it through the long-term plan, and to assist teachers to find links between EfS, curriculum areas and really good achievement objectives. We've also worked with the new curriculum on that—we were all beginners. (Primary principal)

I do try to co-ordinate what goes on in the curriculum with what goes on generally in the school. For example, to make sure that if we are telling the students that educationally they should think about sustainability, then we're applying the same in management. So we are using recycled paper from Konica Minolta ... I've been gathering information on triple bottom line reporting ... With property we're trying to think before we do something—are we using the best materials so we can hold our heads up? ... We have to decide whether to spend more in some areas now to save in the future ... in the next annual report will be a commentary on sustainability, but ideally we will get to having 'goal, action, outcome'.

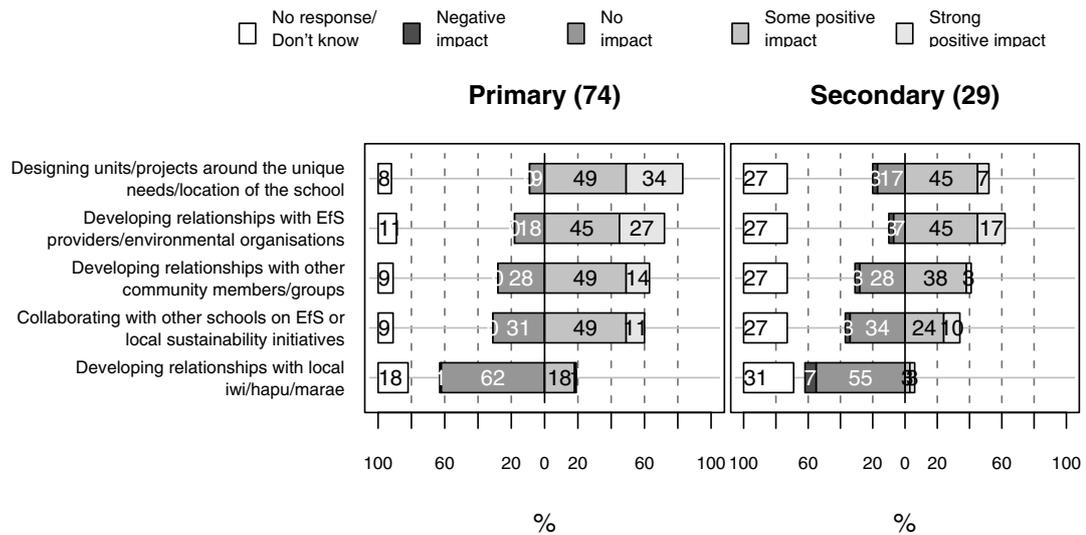
(Executive officer, secondary case study)

Notwithstanding these instances of change, current school structures can be difficult to shift. While nearly all the surveyed lead teachers suggested that NEfS professional development had led them to reflect on the purpose, nature and structure of schooling (at least 80 percent of both primary and secondary), only 48 percent of primary respondents and 7 percent of secondary respondents agreed that NEfS had impacted on “reorienting school structures to provide opportunities for EfS (eg, timetables)”. EfS advisors also rated school structures such as timetables to be the least amenable to change. This suggests that some of the traditional schooling structures, particularly at secondary level, may not sit so well with programmes involving integrated curriculum and authentic action learning, often in partnership with communities. The advisors are aware that more *transformational* structural change may be necessary if EfS is to be implemented in these ways. This implicates the overall culture of the school and the alignment between that culture and the structures of the school. Becoming sustainable can then serve as a principle that supports everybody to become more innovative within (and networked between) their particular areas of responsibility, while also providing rich contexts for student learning and leadership. As the comment from one adviser shows, this is beginning to happen in some cases:

[One] school has everybody involved. The principal and curriculum leader give staff the time and space to try programmes, where they don't know exactly what it's going to look like. EfS work also incorporates an e-officer, the board of trustees, etc. They've appreciated that we've only scratched the surface this year, but it's ongoing contact and we're taking small steps. When you go into the school and the kids present their findings they are buzzing, and have confidence. They ask questions without inhibitions ... EfS is part of their school ethos but it doesn't have to be upfront all the time. It's just incorporated in what the school does. Everybody's involved and can do something about it. (EfS adviser)

School–community partnerships

Another transformational aspect of the changes to practice signalled by EfS initiatives is that the imperative to take authentic action takes learning out of the classroom and into the wider community. When this happens conventional boundaries between school and community become blurred and partnerships develop to support students' learning. The survey asked respondents to comment on the extent to which involvement with EfS advisors had impacted on their ability to meet these challenges. The results are shown in Figure 13. Between a quarter and a third of the secondary participants did not respond to these items. Previously reported responses suggest that these are likely to be teachers working alone or in a small group, predominantly making changes in their class curriculum at this stage.

Figure 13: How well NEfS supported development of community relationships

The results suggest that NEfS advisors are particularly good at identifying and making links to places/projects in the local context with the potential to support sustainability programmes at the school. The advisors' roles as connectors of people and resources, including other EfS providers, has already been noted in Chapter 4. In around half the primary schools but only about a third of the secondary schools advisors were seen to have impacted positively on developing relationships with other groups and other schools. Note, however, that only 18 percent of primary schools and 3 percent of secondary schools said that NEfS had positively impacted on their relationship with iwi, hapū, or marae. Again, this is consistent with the finding in Chapter 3 that advisors themselves need more support to make links and develop their knowledge and experience in this area.

Evaluating impacts of EfS on schooling, teaching and curriculum development

Systems thinkers in education often argue that a deliberate focus on organisational learning is a key to adaptation and survival in times of rapid change. Schools have a long history as organisations set up to deliver a “standard model” of schooling characterised by a view of knowledge as facts and procedures to be transferred from the possession of teachers to the possession of students as efficiently as possible, in a predetermined logical order (eg, simple to complex, concrete to abstract) and in much the same manner for all students at each age and stage (Gilbert, 2005; Sawyer, 2008). The structures of schools (subjects, timetables, age-group classes, assessment regimes etc.) and their associated processes (planning, traditional pedagogies, assessment, reporting and accountability procedures) all support this standard model, as do the structures and procedures of the organisations that support and monitor the work of schools (Ministry of Education, Education Review Office, New Zealand Qualifications Authority). The standard model of schooling is understood by the wider community, and informs the expectations of both students and parents. All of this makes working for complex educational change very demanding, especially at the secondary school level which has always been organised more strongly around these standard features (eg, by employing specialist subject teachers who teach students in small blocks of time, and by the use of standardised examinations for high-stakes accounting of students' learning progress).

What do schools, as organisations, need to learn to do differently to prepare students for a rapidly changing world? Sawyer's discussion of the transformative changes needed if we are to prepare students for living and working in the 21st century is informed by a review of two decades of research in the fields of the “learning sciences”. He identifies four key insights from this expanding field of research:

The importance of learning deeper conceptual understanding, rather than superficial facts and procedures.

The importance of learning connected and coherent knowledge, rather than knowledge compartmentalised into distinct subjects and courses.

The importance of learning authentic knowledge in its context of use, rather than decontextualised classroom exercises

The importance of learning in collaboration rather than isolation. (Sawyer, 2008, p. 58)

As outlined in Chapter 3, EfS challenges the standard model of schooling and demands changes in the ways those who work within them conceptualise the nature and purposes of their work. The model advocated by the research literature, embedded in the policy documents and intended by the model of EfS provision, is congruent with Sawyer's four insights on paper. But how do these intentions play out in practice? With one eye on the enormity of the challenges, we now evaluate the findings reported in this chapter to ask how successfully the NEfS Advisory Service appears to be contributing to transformative change at school-wide and individual teacher levels.

Students cannot be expected to achieve deeper, connected, coherent conceptual understandings unless their teachers have the necessary content and pedagogical knowledge to provide the types of learning opportunities and experiences that support such outcomes. The evidence presented in this chapter, and accumulated so far across the whole report, suggests NEfS professional learning has supported teachers to deepen their knowledge in the areas of EfS traditionally associated with environmental education and have developed some multidimensional views of sustainability. Still the broadening of the scope of sustainability education to connect in economic and political systems and knowledge from other cultures (and especially Māori knowledge) needs further support and development. The expanded, more complex view of sustainability is clearly ground-breaking for advisors as well as for teachers. In this context, the continuation of the current model of collective professional learning for the advisors themselves seems important to sustain.

EfS practices and values need to be lived and modelled, not just talked about, and this has implications for the ways in which all aspects of the school are organised, including the adoption of participatory practices that involve students, their families and communities in the learning decisions made and actions taken for sustainability. The evidence presented in this chapter adds to the earlier findings that such practices, with their associated structural changes, may be more easily achieved in primary schools and in small schools. Given that secondary schools tend to be larger, these two factors are not unrelated, but they do present some differences as well as commonalities and both should be kept in mind. Table 20 speculates on the relative impact of each factor where significant differences between primary and secondary school responses were reported in this chapter. These ideas would need to be tested by further investigation but they may have implications for the strategies NEfS advisors could develop to address the secondary challenge.

Table 20: Weighing the relative impact of size and school level on the challenges of achieving EfS changes

Predominantly a size impact?	Combination of size and structural differences?	Predominantly a structural impact?
Participatory decision-making Implementing sustainable practices school-wide	Leadership support for EfS Developing EfS vision and strategic plan	Updated curriculum plans Reorienting timetables and other school structures

The vision statement, principles, values and key competencies in *The New Zealand Curriculum* are congruent with aspirations for EfS and could be implemented in ways that support Sawyer's four insights for a 21st century education, as listed above. For example, the valued outcomes signalled by the curriculum's vision include being well connected to others, the land and the environment, developing the knowledge, skills and disposition to keep on learning across the

lifespan, being an informed decision-maker and being an active contributor to New Zealand's social, economic, cultural and environmental wellbeing. The evidence shows that teachers involved in EfS professional learning do see this match between EfS intentions and *The New Zealand Curriculum*, although some of them are not as confident that *The New Zealand Curriculum* also gives them the mandate needed to implement EfS initiatives. Nevertheless, NEfS professional development has led to perceived shifts in teachers' pedagogies and curriculum planning enable opportunities for transformational teaching and learning, systems thinking and change, and learning experiences that better reflect the principles of the Treaty of Waitangi.

Seventy-five percent of primary and 85 percent of secondary teachers said NEfS professional development had led them to include more sustainability content in their teaching. Some schools described EfS as providing an umbrella for design of the whole-school curriculum, while others included EfS as an "integrating theme" across syndicates or learning areas. Reflecting the combination of size and structural challenges already discussed, secondary schools were more likely to develop EfS as a co-curricular activity, which is more manageable for a small number of enthusiastic teachers, but also preserves formal curriculum space for traditional content. As might be expected given the history of its development, where EfS was integrated into the secondary curriculum, the learning was most often located in science and social studies. However, there are interesting indications in the secondary case study that, where an EfS adviser is successful in working more at the whole-school level, teachers of other subject areas can begin to see connections and the seeming impasse created by strong secondary school curriculum and structural traditions can be breached.

The curriculum also advocates the use of teacher inquiry as a means of assessing the effectiveness of teaching and an impetus for continuous improvement. All survey respondents agreed that EfS encourages effective teaching, but does EfS Advisory input prepare them to take the plunge and change their own practice? It seems that a majority (just) do. Sixty percent of primary and 55 percent of secondary teachers indicated that NEfS professional development had led them to make changes to their teaching approach.⁵² These changes included: adopting more facilitative teaching styles; enabling students to share decision-making; and providing learning opportunities that were more authentic, action-oriented, inquiry-based or cross-cultural. There also appears to be some movement towards authentic learning opportunities driving assessment, rather than assessment driving learning opportunities, but we have already noted this as a problem area that we need to return to in the final section of the report.

The proof of the perceived effectiveness and impact of teachers' EfS professional learning must ultimately be sought by investigating what changed for the students. This is the question to which we now turn.

⁵² About half of the teachers who did not agree that they had changed their teaching style as a result of NEfS professional development suggested that this was because their personal teaching pedagogy already aligned with EfS. They still made changes in other areas, such as curriculum development.

7. Impacts on student learning

The ultimate success of any professional development initiative rests with evidence that students have experienced rich new opportunities to learn, with associated success in meeting the intended learning outcomes. In the area of EfS, as we have already seen, this simple change logic can be easier said than achieved and documented. Living more sustainably requires changes in values, along with the disposition and competencies to act in certain ways. Learning new knowledge and skills is necessary but not sufficient to achieve EfS goals. Whereas knowledge and skills have a long history of assessment, the nature of making progress in strengthening competencies and dispositions is still very much a matter for debate amongst leading educators in this area (Carr, 2008). This makes the imperative to demonstrate evidence of impact on students' learning particularly challenging. Nevertheless, this chapter presents interesting evidence that NEfS professional learning for teachers is having positive impacts on students. The chapter addresses the final part of subquestion 2d:

Table 21: The subsection of evaluation Q2d addressed in this chapter

Main evaluation subquestion (2d)	Subquestion as adapted to NEfS
(d) To what extent do the EfS initiatives impact on: students' learning opportunities, understanding and assessment of student learning outcomes in EfS; teaching practices, including pedagogical change; school-wide structures and curriculum development; and community partnerships and sustainability?	To what extent does the NEfS Advisory Service (sometimes in collaboration with other EfS providers) impact on: <ul style="list-style-type: none"> students' learning outcomes?

The chapter addresses this subquestion through several different lenses:

- teachers' accounts of students' learning opportunities and associated outcomes (with some confirmatory data from students in the case study schools)
- evidence of the transfer of learning to students' lives beyond school
- the extent to which learning experiences align with aspirations for Māori students' success, as expressed in *Ka Hikitia* (Ministry of Education, 2008)
- the extent to which the goals outlined in the *Guidelines for Environmental Education* (Ministry of Education, 1999) have been achieved by EfS
- assessment practices and challenges in relation to EfS.

We begin by recapping on the extent to which EfS was likely to have impacted on students at different levels of schooling. Figure 6 (Chapter 5) suggested that near 60 percent of primary schools and only 7 percent of secondary schools that have accessed NEfS Advisory Services involved *most* of the school's students in EfS. Students from a *range* of year levels were involved in EfS in 83 percent of primary schools and 66 percent of secondary schools. Survey respondents were also asked to indicate the year levels at which they had personally engaged students in EfS learning, as shown in Table 22.

Table 22: Year level of students engaged in EfS with responding teacher (n=103)

Years 0–3 %	Years 4–6 %	Years 7–8 %	Years 9–10 %	Years 11–13 %
35.9	44.7	35.9	15.5	14.6

Table adds to more than 100 percent because some teachers reported multi-age activities.

The distribution of percentages across the table suggests that these opportunities were more likely to be experienced by primary school students, although greater numbers of primary teachers took part in the survey so caution is needed in interpreting this pattern. As we have already seen, in many schools (particularly secondary schools), EfS learning experiences may be limited to certain classes and subjects.

As might be anticipated, given the differences reported earlier, students across all primary years (0–8) were more likely to be in schools with rolls of under 300 students while those in Years 9–13 were more likely to be in schools with rolls of 500 students or more.

Learning opportunities offered through EfS, and associated outcomes

Lead teacher survey respondents were asked to select one learning opportunity that they believed exemplified the school's approach to EfS. The examples they gave included a broad array of curricular and co-curricular learning opportunities, as illustrated by the selected examples in Tables 23 and 24.

Table 23: Examples of EfS learning experiences described by primary teachers

Type	Teacher description
Class study	Year 6 class—multicultural and ranging from special needs to highly gifted. Question: How, what and why do we want to sustain our NZ landscapes? What adaptations and issues do we need to consider? A three-term inquiry unit. One of our direct actions was informing through art.
Class study	The senior class at our school studied energy. This involved looking at the ways we get electricity. This led to a class study in 2008 on “How sustainable is our school's use of electricity?” We entered the Transpower awards and were assigned an engineer through the Institute of Professional Engineers. We have written a report which shows our school uses audit meter reading charts graphs, problem areas and how we can be more sustainable in our school's use of electricity.
Class study	A unit on sustainability: How do the environmental choices we make now affect us for the future? Tried to persuade a local focus, ie, river pollution.
Class study	Symbols are a form of identity: Looking at what makes our school—“our school”; How do we identify with the school—Why—look at history of “Windmill”.
Class study/whole-school	Setting up the Edible Gardens. My class initiated and facilitated the project before we set up the school EnviroGroup. The children designed the area, which was previously a waste area, applied for grants and have now planted our class plot. They have learnt how plants grow, the best conditions, etc. We will share the produce for brain food in 2009.
Cross-curricular focus	Children researched NZ native trees their house groups are named after. Science: functioning of a tree; Social Studies: value of trees as a natural resource; Technology: recycled paper making. Using picture books and related experiential activities children explored the concepts of sustainability plus interdependence with kowhai seeds found at school. Children researched how to grow a kowhai tree. Sent letters and seeds with instruction to people in community. The children are currently raising seedlings for future planting.
Māori cultural focus	“Te Whata kai o Rangihoua” focused on our taonga from land and sea. [We] practise and compare traditional and modern day kai gathering and cooking. Researching and linking our whakapapa, stories and landforms' names.
Whole-school focus	Whole-school focus on energy—“Energy—if it's renewable, why conserve?” which was a whole-school inquiry-based learning focus inspired by installation of our solar panels. We have also just completed a sculpture focus—creating “pous” to represent the Māori gods for air ... to display at KidsDo Sculpture exhibition.
Whole-school focus	Term 1: Water. Term 2: Energy. Term 3: Zero waste. Term 4: Find a need—Trash to Treasure. Whole year—Education for sustainability.

Table 24: Examples of EfS learning experiences described by secondary teachers

Type	Teacher description
Co-curricular	Setting up a senior Environment club (extracurricular): developing “enviro-guidelines” for every classroom; setting up paper recycling programme; fundraising for local eco-sanctuary.
Co-curricular	World Environment Day. Public school rubbish audit.
Co-curricular	We only operate as a lunchtime [sustainability] club at present. With a roll of 750 we have about 12 active members.
Subject-based	Year 12, Level 2 biology field trip to Mahoenui weta reserve, Waitomo caves and Te Kauri park. Internal components x2; Year 10—Ecology unit.
Subject-based	The class is “Environmental Improvement”—it is based on revegetating local remnants of native bush with eco-sourced seedlings grown by the students. We use Agriculture and Horticulture Unit standards as our assessments.
Subject-based	Year 9 science class looked at climate change during a “gases” topic. What is it, what effect does it have, what can we do about it? Students did action research around it—students choose some action they would do and carried it out.
Subject-based	We have several Year 12 and Year 13 units. Year 12, term 1—the damaged Earth, a unit on climate change and taking action.

Survey respondents were provided with a list of statements about learning opportunities that might be available to students during EfS. Thinking about the example they had just described (as per the tables above) they were asked to rate how strongly they agreed or disagreed that each opportunity had occurred in this instance. Table 25 shows the percentage of teachers who agreed or strongly agreed with each of these statements. The table is organised in two columns of frequency groupings. Each statement appears once in the primary column and once in the secondary column. Note that between 24–41 percent of secondary teachers did not respond to these items (perhaps these cases involved extracurricular activities of which the survey respondent was not part) and no responses fell between 20–29 percent.

Table 25: Learning opportunities and outcomes available to students during EfS

Agree/ Strongly agree %	Primary schools (n=74)	Secondary schools (n=29)
90–100	Increased their engagement, interest or motivation in learning (92) Questioned and researched about a specific environmental issue or strategy (91)	
80–89	Developed their critical thinking skills (88) Reflected on their personal understandings of sustainability (85) Developed their understanding about the biophysical environment (84) Imagined the future (82) Made key decisions about what to study or how to undertake actions (80) Took action for sustainability (80)	
70–79	Clarified their ethics and values in relation to sustainability (71) Changed their lifestyle or practices outside of school as a result (70)	Increased their engagement, interest or motivation in learning (72)
60–69	Used a variety of knowledge systems or disciplines to understand a sustainability issue (67) Developed an understanding of relationships between local, national and global sustainability (64) Questioned and learnt about big-picture sustainability themes like social justice, ecological sustainability, cultural diversity, wealth distribution, globalisation (64) Built up a picture of a complex phenomenon and change processes (60)	Questioned and researched about a specific environmental issue or strategy (69) Clarified their ethics and values in relation to sustainability (66) Imagined the future (66) Developed their understanding about the biophysical environment (65) Reflected on their personal understandings of sustainability (62) Took action for sustainability (62)
50–59		Developed their critical thinking skills (55) Worked with environmentally focused partners (eg, local government, iwi, sustainable business, NGOs) (52) Made key decisions about what to study or how to undertake actions (51)
40–49	Worked with environmentally focused partners (eg, local government, iwi, sustainable business, NGOs) (47) Drew on, or developed their understanding of, Māori concepts (47)	Developed an understanding of relationships between local, national and global sustainability (48) Used a variety of knowledge systems or disciplines to understand a sustainability issue (48) Questioned and learnt about big-picture sustainability themes like social justice, ecological sustainability, cultural diversity, wealth distribution, globalisation (45)
30–39		Built up a picture of a complex phenomenon and change processes (38) Changed their lifestyle or practices outside of school as a result (38) Drew on, or developed their understanding of, Māori concepts (31)
10–19	Felt overwhelmed and disempowered about sustainability issues (15)	Felt overwhelmed and disempowered about sustainability issues (10)

As might be predicted by the pattern of responses in the earlier chapters, primary school students are more likely to experience learning opportunities that align with EfS intentions. The same opportunities are experienced by secondary students, and the ranking order is very similar in most cases but typically fewer secondary teachers agreed or strongly agreed that their students had these opportunities (the remainder of the secondary teachers were more likely to not respond than to disagree). An exception to this pattern is working with environmentally focused partners, which was more likely to be a part of secondary students' experiences.

Increasing engagement and motivation as learners and citizens

Of particular interest in the patterns of the table just presented is that the highest rated item overall was “students increased their engagement, interest or motivation in learning” as a result of EfS learning experiences (92 percent of primary and 72 percent of secondary respondents agreed or strongly agreed). Engagement has been shown to be associated with learning success, and the relationship is captured in the idea that each student has an evolving “learning career” during which their accumulating experiences of learning success (or not) come to shape how they see themselves as people who can learn and be successful. While not directly expressed, this relationship is hinted at by the following comment from one adviser:

EfS has the potential to engage students who are not successful in ‘traditional’ classrooms. Many learning/behaviour issues could be addressed through the teaching approaches and real-life context employed by EfS. (EfS adviser)

Measurement and interpretation complexities precluded us from asking about achievement directly but the case studies did endorse the argument that EfS learning opportunities had enabled students to stretch themselves both academically and personally. For example, three case study secondary school teachers who taught in different academic disciplines suggested the way they had developed their own EfS content and pedagogy had enabled their students to become better researchers, designers and linguists (through an environmental science, technology and a language course respectively). Likewise, primary school interviewees suggested that setting learning in authentic contexts had supported students' achievement in core learning areas, including literacy and numeracy:

In this school they've always achieved quite well, students generally read at a good level ... but [developing EfS] has helped student achievement in that they have a greater knowledge of the world. The biggest gains have been in their thinking skills. (EfS lead teacher, primary case study)

When doing inquiry we've identified information literacy as an area we need to develop. How students can explore [and develop] higher order thinking ... so they can participate in public debates around these issues, like [writing] letters to editor asking really good questions to inform and provoke discussion. That requires high levels of information literacy—so EfS has given us a whole lot of new learning goals. (Principal, primary case study)

Case study teachers (and some students) in both schools also talked about EfS “changing lives” partly because of a new found sense of engagement and success, either through curricular or co-curricular learning opportunities:

[By bringing in a sustainability focus] it is intrinsically stimulating. They are interested and their language responds accordingly ... Some students are more interested than others—but if some have a buzz then others get caught up ... It engages their brains. I'm not just a 'pen' languages teacher. I'm developing their thinking skills ... I still assess the four main language skills [reading, listening, comprehension, etc.]. (Languages teacher, secondary school)

EfS experiences give kids the skills to pursue things they wouldn't otherwise do, and can build a lot of confidence. You don't necessarily get that amount of change in a traditional subject ... [For one student]

I'd never seen anyone so excited to plant a tree. Getting kids out to ... run the trap lines and follow them through the bush seems like a really scary thing to do. For a lot of kids that might be the first time they've been allowed to explore or do something a little dangerous or challenging. And it changes them. They can do something and it's not related to how good their writing skills are or their NCEA credits. It's about developing them as people. (Lead teacher, secondary school)

Secondary students who were interviewed said that in classes where teachers were developing EfS content and pedagogy, learning was more interesting and rewarding, and they enjoyed "doing something that is important so you can make a difference":

It's something you can use in your life (not like [other subjects]). (Student, secondary case study)

It's more hands on. You get in contact with the actual problem. It's part of your own environmental studies [because] it's your own learning. I found it a new skill. (Student, secondary case study)

At the case study primary school, where EfS was part of the school ethos, it was very clear that the students were key decision-makers in all areas and levels of the school.

Opportunities to take action and explore big-picture themes

Table 25 shows, most primary respondents and more than half the secondary respondents to the survey agreed that students had reflected on their personal understandings of sustainability and developed their understanding of the biophysical environment through their EfS activities. Two-thirds of primary respondents and nearly half the secondary respondents agreed that learning opportunities had enabled students to use a variety of knowledge systems or disciplines to understand an area, that they had been able to learn in authentic contexts with people from outside the school and that they had developed their critical thinking skills as well as their future thinking skills. Eighty percent of primary and 62 percent of secondary teachers agreed that their EfS learning opportunities had involved students taking action for sustainability.

These findings are encouraging because these types of learning opportunities match well with broader educational literature on engagement, 21st century learning, transformational learning and systems thinking (see, for example, the discussion at the end of Chapter 6). One caveat is that the opportunities were more likely to be offered in the context of specific environmental issues and with associated action for sustainability. Students experienced fewer opportunities to explore big-picture sustainability themes such as social justice, wealth distribution or globalisation. Similarly, opportunities to build a picture of complex phenomenon and change processes were among the lower ranked items for both primary and secondary students.⁵³

Between 10 and 15 percent of lead teachers also suggested that at least some of their students felt overwhelmed or disempowered about sustainability issues. This "action paralysis" has been associated with some simple cause-and-effect problem-solving approaches to sustainability, where students are not well supported to grasp complexity and disengage when they find that sustainability challenges cannot be easily solved (Jensen, 2002; Sterling, 2002, as cited in Tilbury, Coleman, & Garlick, 2005). While the percentages are relatively low, it suggests that NEfS advisors must continue to support teachers to engage students in complex systemic thinking.

Students who participated in focus groups as part of the primary and secondary case studies suggested that some students who had been involved in a range of EfS learning opportunities (curricular and co-curricular) were able to

⁵³ Considering that *some* people might think these items would be most appropriate for older students, it is worth noting the low levels of agreement (and response rate) from secondary respondents.

make complex systems connections for themselves. For example, a Year 10 student involved in the secondary school's environmental group and marine biology group said "Don't litter, you might be killing a whale" and the other students followed up with a wide range of statistics and interconnections that explained why. In the primary school, students talked about "good" and "bad" things for sustaining the planet's limited resources but then explained that even today's most sustainable solutions, such as hybrid cars, had a "bit of both".

Opportunities to take learning into the wider community

School-partner relationships have provided new learning opportunities for students. Approximately half of the EfS learning experiences described by survey respondents involved students working with environmentally focused partners (eg, local government, iwi, sustainable business, NGOs). As one case study teacher said:

We couldn't do it on our own. [Like the topic on] flax as a resource. I learnt quite a lot myself [working with community members and the local marae]. You want that because if you just did it in classrooms we wouldn't have impact because [teachers] are general practitioners, not the expert. (Teacher, primary school)

The case studies provided a rich picture of the ways that community organisations and family members became involved in (and sometimes led) sustainability practices and learning opportunities. For example, at the case study primary school we interviewed two parents who had supported a range of EfS learning opportunities, including building a shade house, and also attended the school's Envirogroup meetings when possible. Both mentioned that, as the school had developed its EfS identity, other parents and the local community had become more supportive of—and involved in—the school and sustainability.⁵⁴ Building on a suggestion from EnviroSchools, the students told us about their development of surveys to catalogue parents' various skill sets, on which the students and school might be able to draw at a later date.

At the secondary case study school we were told of a developing initiative that involved the school's gardener, a Māori studies tutor from a local tertiary institution and a number of students. It was led by members of the Māori bilingual unit in consultation with their whānau and involved planting a flax garden and drawing on appropriate community expertise to learn how to grow, cut, prepare and weave the flax, with the intention of eventually being able to give tertiary students and members of the community access to the flax and seedlings for their own purposes with due adherence to tikanga. Four teacher interviewees had already made, or planned to make, curriculum connections to the initiative (for example, the technology teacher intended to explore flax in a sustainable design topic, and students mentioned that an extension class was designing a shed for the area). This illustrates the way in which EfS can support students to contribute to their local communities, and local communities to contribute reciprocally to students' schooling. It also shows that community partnerships can enable new connections and new learning for teachers, as well as for students. For example, the technology teacher hoped to tap into expertise within the Māori community to support students' sustainable design investigations (noting that prior to this she had felt too uncertain to touch on the topic in class).

Learning opportunities and outcomes involving wider school initiatives

As we saw in Chapter 6, survey respondents described changes in the wider school as a result of NEfS professional development. The most common responses related to sustainability practices.⁵⁵ Eighty-one percent of primary respondents and 48 percent of secondary respondents indicated that NEfS support had made a positive impact on improving the school's sustainability practices such as recycling, or working towards carbon neutrality. Similarly, 72

⁵⁴ Although one teacher said that some parents thought the school's sustainability focus was too strong.

⁵⁵ Other open responses to this question were coded as: greater staff awareness; community involvement; school plans and structures; and student outcomes.

percent and 44 percent of primary and secondary respondents respectively said involvement in EfS had resulted in improvements to the school's natural environment; for example, by new planting in school grounds.

While these sustainability practices provide rich learning opportunities outside of classes, they are not necessarily neatly separated from the classroom curriculum. The case studies demonstrated that students can make key decisions about how their school could become more sustainable, perhaps as part of a cross-curricular inquiry (as in the primary school), or within a particular learning area or course (as in the secondary school). This participatory decision-making is important for embedding long-term emergent change, and is associated with a recent move in EfS from "action to participation" (Tilbury et al., 2005). For example, the students at the primary school explained how they had gone about making the difficult decision to cut down a tree, surveying students' and parents' perspectives and taking on the responsibility for planting other trees. They explained how complex this decision was, leading them to identify possible ramifications through the drafting of various scenarios including the final outcome.

Students interviewed in the case study schools said they were active within and outside of class time in a range of environmental and wider sustainability initiatives including tree planting, rat trap monitoring, recycling/composting/worm farming, fundraising for a range of causes, organising campaigns and inviting speakers from human rights organisations to the school. There was evidence that the case study schools had become more sustainable, enabling greater coherence between what was being explored in class and what was being modelled to students within the wider school environment. Examples of changed practices included making Fair Trade food available in the staff room, using recycled paper and developing sustainable purchasing policies.

Transferring EfS learning into students' lives and communities beyond school

One area of particular interest to the EfS community (and others) is whether students translate their learning about, in and for the environment/sustainability into their lives and communities beyond school. Seventy percent of the primary respondents thought that their students had done this, as did 39 percent of secondary respondents, although they tended to be less sure, possibly because they do not have the sustained contact with individual students that is more typical of primary school ways of organising learning.

Teachers described how the various ways in which students translated their learning about/in/for sustainability to their lives beyond school provide insights into schools' (and communities') sustainability practices. In decreasing order, examples included: waste management; gardening including vegetable growing and composting; energy conservation; waste reduction: native re-vegetation, such as riparian planting; sustainable procurement; alternatives to car use; and protection of waterways. Table 26 gives examples of these and summarises the number of mentions by those teachers who answered this question. Note the overall tendency to behaviours that "reduce" and "recycle", more than those that "reuse" and "redesign" (Parliamentary Commissioner for the Environment, 2004).

Parents from the primary case study school who were interviewed spoke of the learning and challenges they had received from their children. Students at both primary and secondary levels explained what they were doing in their lives outside of school:

[When I leave school I want to do] Health science and stay a member of [regional group] plantings—I want to see my kauris grow. Also it's a fun social thing and you're out of your own social circle meeting people. (Student, secondary school)

We've got like a worm farm and compost bin which we put like the scraps, some of the scraps in the compost and some of the scraps with the rabbits and some of the scraps for the worms, and when we were painting the fence, my mom saved two or three pots and now we have to use them like recycling bins. (Student, primary school)

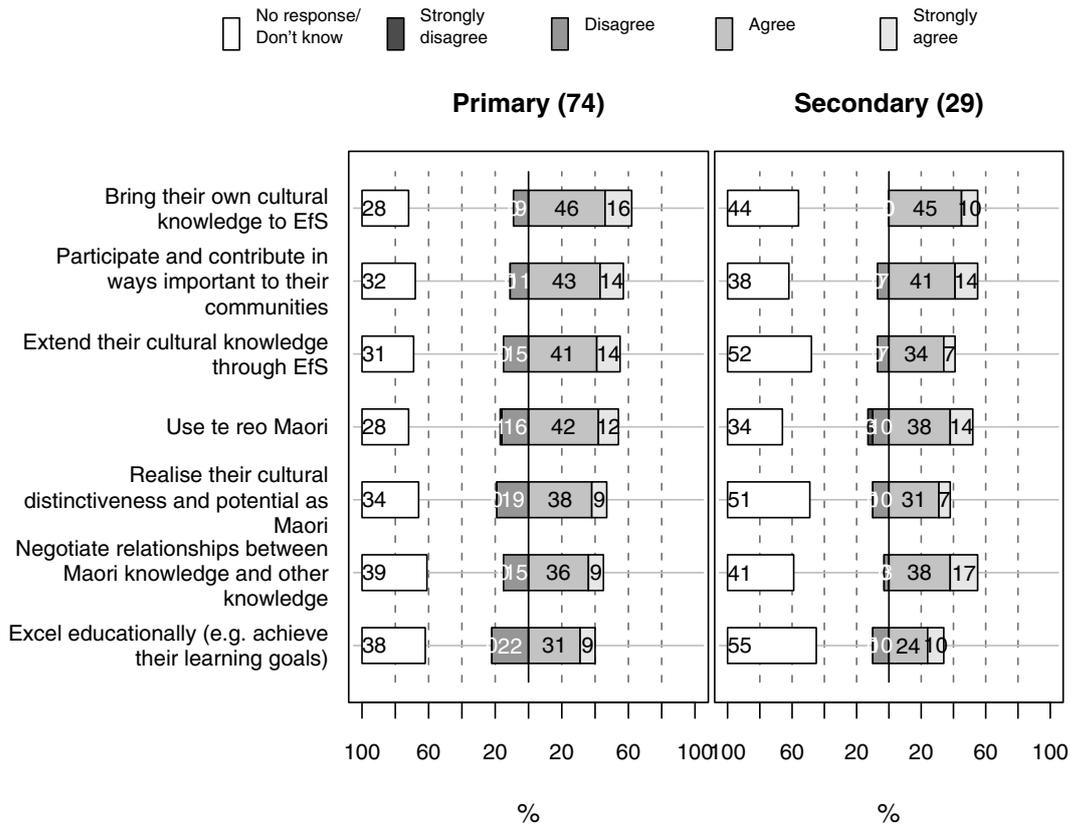
Table 26: Survey respondents' descriptions of students' and families' changes towards sustainable practices after an EfS learning experience (n=65)

	No.	Examples
Waste management	22	Recycling has become part of normal family life for our children's families and they support the concept of reusing organic waste by using their own composts. The biggest changes are linked to recycling. Children are bringing their cans to school to our collection depot. Parents have commented on how their children are screening what goes in the green crate. More children are bringing lunch items in recyclable containers.
Awareness and interests	19	An awareness of their local environment. Passing knowledge on to whānau. All enjoy being involved in our project work (planting a reserve) and offer to work during their free time. They subscribe to environmental magazines and adore watching Te Radar on TV 1.
Gardening	18	A large number of my children have established and planted vegetable gardens at home. This is very exciting. Some are bringing in seedlings, collecting seeds, growing sunflowers. Talking to their grandparents about their garden and the school garden.
Energy use	11	Used clothing instead of heaters to get warm. Turned lights off when leaving a room. Put energy saving light bulbs in at home. Discussed insulation with family.
Waste reduction	9	Reusing stuff at home as opposed to putting it in the bin. [Family members] asked their places of work to begin recycling and waste minimisation.
Water conservation	7	Turning off the tap when brushing teeth, tipping any old water over plants, not flushing wee (at home), checking for leaking taps.
Revegetation	6	The urge to riparian [plant a] section our school stream and utilise it more effectively. They have made individual promises such as ... replace cut down trees... etc.
Procurement	3	Supermarket shopping more thoughtfully done. Awareness of where products came from and energy used and consequences on people from mass production, so often talk about where something is made and [they're] proud if it is NZ made.
Transport	3	Making choices for transport that look after the environment. Walk instead of drive.
Waterways	3	Respect for quantities being taken, protection of coastal areas and waterways. Learnt to wash cars on grass and not to pollute waterways.

EfS and Māori knowledge and values

We developed a range of survey items based on *Ka Hikitia* (Ministry of Education, 2008) in an attempt to understand the extent to which Māori students are supported to participate and enjoy success as Māori in EfS learning experiences. At least a third of respondents did not answer these questions, but those who did most often indicated that Māori students were able to bring their cultural knowledge to EfS, extend this knowledge and contribute in ways important to their communities. Overall, the items suggested that, at least in some schools, EfS contributed to affirming and realising Māori students' identities as Māori. A slightly smaller proportion agreed that EfS helps Māori students to achieve their general learning goals. While this is somewhat concerning given the potential relationships between EfS and greater student engagement discussed above, there are many potential explanations for this finding including the challenges in establishing a direct relationship between EfS and achievement and the presence of EfS co-curricular space.

Figure 14: Survey respondents' assessment of EfS contribution to Māori students' success



Bicultural learning opportunities for all students

The Treaty of Waitangi curriculum principle suggests that “all students have the opportunity to acquire knowledge of te reo Māori me ona tikanga” (Ministry of Education, 2007a, p. 9). When analysing the EfS learning example they had just provided only about a half of primary respondents and a third of secondary respondents said that this opportunity “drew on, or developed their understanding of Māori concepts” (see Table 25 above). Similarly we see again in Figure 14 that only just over half the secondary teachers, and fewer primary teachers, felt they had provided opportunities to negotiate relationships between Māori knowledge and other knowledge. This endorses findings in the earlier sections that this is an area where the advisors need more support, so that they can in turn provide more support to teachers. The following examples from the case study schools hint at the opportunities afforded by EfS and the powerful learning benefits that have ensued.

At the case study primary school, the principal discussed how developing EfS had helped them to develop more meaningful cross-cultural learning, and said that this had been to the benefit of students of all ethnicities:

For us, before we started in EfS journey we might have had a little mihi, and small powhiri. Now we have just had the most awesome week of harakeke tikanga, including a marae visit. Students made tukutuku in patterns [as part of maths] and then they could see them in the marae. You could see the pride of our Māori students, and for everyone. If you are happy and proud then you will learn. [We used] a whole range of top achievement objectives ... I drove it pretty strongly—I’m not for tokenism. It would have benefited our Māori students and everybody [else as well], and the parents were amazing. Everyone loves it. It is experiencing how another culture respects a living thing, and has ritual around it, and worthwhile activity. (Primary principal)

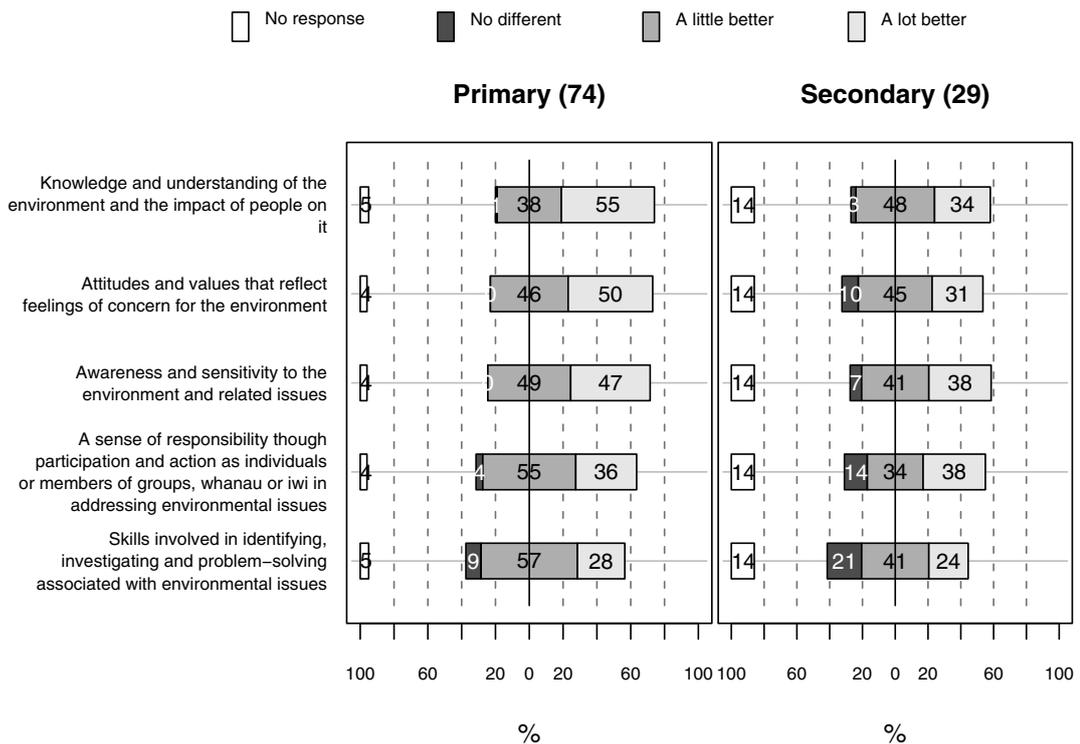
At the secondary school one teacher explained:

Schools aren't very good at analysing themselves or society. [They're] still very European. That's the way we do things—other cultures are just alternatives, but they aren't core alternatives. EfS shows that there are other ways of doing things, and it has a values emphasis—so you can say 'well does it have to be that way?' The holistic dimension is important ... I present science as just one way of looking at the world ... and make it clear I'm offering an alternative or just another way to look at a problem.
(Environmental science teacher, secondary school)

Achieving the aims of the *Guidelines for Environmental Education*

The *Guidelines for Environmental Education* (Ministry of Education, 1999) outline five overall aims for students. Figure 15 shows the extent to which teachers agreed these aims had been met, or not. As might be predicted from the types of learning experiences described in the earlier sections of this chapter, the aim of increasing students' knowledge and understanding was seen as the area of greatest learning gains. The lowest ranked of the five aims—helping students develop skills for identifying, investigating and problem solving in relation to environmental issues—was seen by just a quarter of the teachers at both primary and secondary levels as an area where substantial gains were made. Note the relatively higher nonresponse from secondary teachers to all these items.

Figure 15: Respondents' evaluation of the realisation of the aims in the *Guidelines for Environmental Education*



At least 75 percent of the EfS advisors believed that their work had had a positive impact on meeting each of these aims. Secondary EfS advisors indicated that their work had slightly less impact on the fifth outcome: “A sense of responsibility through participation and action as individuals or members of groups, whānau or iwi in addressing environmental issues”. The school survey data confirmed the advisors’ perceptions here even though this was not the area of least gain from the teachers’ perspectives.

Assessment of EfS-related achievement

We have already seen that assessment of EfS-related achievement poses a particular challenge for both EfS advisors and teachers. Chapter 3 noted that part of the role (as with all advisory services) of the advisors is to help schools to “gather, analyse and use data, including student achievement data, as the basis for professional decision-making”⁵⁶ and that they find this difficult to achieve:

Gathering data to provide evidence of shifts is extremely challenging (especially student achievement data) as EfS is closely related to values and attitudes, and changes in this domain may not be evident immediately. (EfS adviser)

The EfS advisors explained the types of evidence they collect, and encourage teachers to collect, to understand whether and how they are making a difference. These include:

- portfolio documentation
- peer and self-assessment
- pre/post questionnaires in key knowledge areas
- participation rubrics
- classroom observation
- NCEA results.

Despite these efforts by the advisors the three assessment-related items were the lowest ranked of all the items for gains in pedagogical content knowledge (see Chapter 6). About one-third of primary respondents, and a slightly greater proportion of secondary respondents, said that NEfS support had not helped them to understand how to document or assess students’ learning or achievement in EfS. A separate EfS contract has recently developed NCEA achievement standards in EfS, which advisors expect will be useful in the secondary sector, as long as EfS doesn’t become entirely “assessment-driven”:

Now we have developed cross-curricular EfS achievement standards ... We’ll be one of the first countries to have these kinds of qualifications. Previously it [having no achievement standards] was a big constraint because people thought ‘it’s not assessable’, so therefore people wouldn’t do it. So we’re challenging not only that [EfS] gap, but also the way assessment happens. (National co-coordinator)

Assessment practice in the case study schools

The case study schools were developing their ideas about what could constitute evidence of student learning outcomes, and hence appropriate assessment processes, in different ways. At the secondary school, teachers were drawing flexibly on a range of NCEA unit and achievement standards in conventional learning areas, and one course used the new EfS achievement standards. In this course students used a reflective journal to document their unfolding learning and actions over time, and the teacher had worked closely with the EfS adviser to understand and apply the standards with strong links to *The New Zealand Curriculum* (Ministry of Education, 2007a).

By contrast, the secondary teacher at the sole-interview school perceived the EfS standards to be too complex and too demanding for her students’ interests and abilities:

⁵⁶ This outcome has been changed in the 2008 schedule to say: “Teachers and schools improve their practice through evidence informed inquiry that will help them understand what is happening for their students, enable them to examine research that might help explain why, and examine the impact of their practice on students’ learning and achievement.”

I'm not a big fan of sustainability standards because they are too complex—both times [I advertised a course using them] I only had five students sign up. They're not attractive to the students [because] you can't bullet point what the students would learn. (Secondary lead teacher, individual interview)

The primary school was engaged in a teacher inquiry, supported by the EfS adviser, about the best way to understand and measure student achievement to best reflect their EfS aims and the key competencies. They had linked a range of achievement objectives into whole-school and full-term EfS inquiries, focusing on their potential to make the inquiry more meaningful to students and the community. Some teachers had come to the conclusion that the best way to “assess” students' EfS thinking and action competence was to ask students about why they had said or done something that they believed to be sustainable, and look for the level of complexity and interconnected systems in their answers. Another way was for students and/or teachers to document students' learning journeys and sustainability actions over time:

[The EfS adviser] involved us in very good workshops this year exploring the key competencies and unpacking them in relation to EfS and our curriculum development ... We looked at matrices and realised they would not work. But the minute we started to move into a context then we could unpack them. Like looking at electricity consumption in the school, and then what does ‘managing self’ mean in that context? Perhaps responsibility to choose to take an action ... but in another situation [like planning towards our celebration] it would look like something else. (Primary school interviewee)

The teacher who made this comment shows a strong awareness of the need to strengthen students' action competence as an outcome of EfS, and that evidence that learners have done so will vary according to the specifics of the context in which they show they are disposed to use their new understandings. This aligns with the discussion of the importance of deeper understanding, coherent and connected learning in authentic contexts, and in collaboration as outlined at the end of Chapter 6. It seems very likely that the quality of the learning experiences enjoyed by the students in this teacher's class would stand in very sharp contrast to those in a class where the teacher (who had much less contact with an NEfS adviser) wants to be able to “bullet point what students learn” as in the quote above. Clearly the teachers in this study still span a wide range of understandings of EfS and its implications for practice, and hence for assessment.

Evaluating overall impacts and outcomes

In this final section of the chapter we address evaluation question 2e. The evidence provided by each of our five reporting lenses is summarised in relation to the three themes of our analytic framework that are directly applicable to students.

Evidence of transformational learning

The literature outlined in Chapter 3 emphasises the transformational intent of EfS learning and this is reflected in our analytic framework. Teachers do see connections between the sorts of outcomes intended for EfS and the vision of the new curriculum, the aims of the *Guidelines for Environmental Education* (Ministry of Education, 1999), and some of the outcomes messages in *Ka Hikitia* (Ministry of Education, 2008). All of these policy sources foresee students as realising their full potential as active contributors to their communities and New Zealand's future. But to what extent did this recognition of alignment translate in actual learning with the potential to transform students' ways of being in the world so that they learn how to, and demonstrate the will and desire to, live more sustainably? As we have already seen several times in this report, fully answering this question rubs up against the limitations of currently available assessment technologies. Nevertheless the evidence reported above shows that the teachers who had received NEfS professional development were mindful of these outcomes, and in most cases were able to evaluate the extent to which they had provided opportunities to help students achieve them.

Teachers' self-reports suggest that many did have this transformative intent in mind when they planned and taught in EfS contexts in class, and supported students' EfS extracurricular activities. A majority of the teachers agreed that students had developed their critical thinking skills, reflected on their personal understandings of sustainability, developed their understanding about the biophysical environment, taken action for sustainability and imagined the future through EfS learning opportunities. Such opportunities are more likely to be provided in primary schools—all were reported by at least 80 percent of the primary teachers, with secondary around 20 percentage points lower (primarily due to secondary nonresponse rates). Nearly as many teachers agreed that students had clarified their ethics and values and modified their lifestyle due to EfS learning opportunities. These opportunities all suggest that NEfS professional development has contributed to learning and can potentially help transform students' dispositions towards more reflective sustainable ways of being/thinking/doing.

One of the more challenging aspects of transformational learning is the aim to help students *become* a certain type of person—there is an important dimension of *identity* work involved. The evidence presented in this chapter introduces the possibility that rich EfS action contexts, because they enable certain students to experience educational success they might not previously have enjoyed, could help transform the ways these students *see themselves as learners* in general. Most teachers said that EfS impacted positively on students' engagement, interest and motivation in their learning. The case study teachers, whose EfS practice seemed in most cases to be more fully developed than that of some of the surveyed teachers, certainly saw participatory engagement in EfS as an important lever for improving achievement in core learning areas including numeracy and literacy. However, comparing data from our different lenses for reporting evidence of outcomes, there are also some hints that the potential for this benefit to transfer beyond EfS contexts to learning in general may not as yet be widely recognised, let alone actively addressed. Given that *lifelong learning* is one of four dimensions of *The New Zealand Curriculum* vision and *learning to learn* is one of eight underpinning principles, this nascent finding seems worthy of a more directed investigation in its own right.

Despite the “good news” that the work of the EfS advisors does appear to have led to a wide range of shifts across schools and within teachers' individual practice, the evidence we have presented also suggests that there is still a considerable way to go before the various message systems of schooling transform to truly reflect EfS expectations of transformational learning. We still see the pull to “content” learning for its own sake, but the question then becomes one of depth versus coverage. And so we turn to the next dimension of our analytic framework.

Evidence of systems thinking

At the end of Chapter 6 we summarised four key insights from two decades of research in the learning sciences. Two of these are directly implicated in our analysis theme of “systems thinking”: “the importance of learning deeper conceptual understanding, rather than superficial facts and procedures; and the importance of learning connected and coherent knowledge, rather than knowledge compartmentalised into distinct subjects and courses” (Sawyer, 2008, p. 58). EfS potentially provides a plethora of rich contexts that cut across traditional learning areas in ways that demand the customised, authentic, collaborative learning that Sawyer, and indeed many other researchers, describe as needed for all learners in the 21st century. To what extent did students experience learning opportunities that could allow them to make these deep links, and to explore sustainability issues from multiple perspectives?

In the light of the emphasis given to systems thinking future-focused commentaries about education in general, not just EfS, it is concerning that specific learning opportunities that could enable students to develop as “systems thinkers” were ranked lower than other opportunities mentioned in the teacher survey. Opportunities for students to question and research a specific environmental issue or strategy were more common than opportunities to question or learn about big-picture sustainability themes or opportunities to use a variety of knowledge systems or disciplines to understand sustainability. Congruent with this pattern, teachers rated themselves as less likely to have helped students build a picture of complex phenomenon and change processes or develop an understanding of relationships between local,

national and global sustainability, compared to other types of learning opportunities. Nevertheless, 60–69 percent of primary teachers thought they had done this, as did 40–49 percent of secondary teachers. The issue here is not that it did not happen but that it was seen as a type of outcome *less likely* to be achieved. This suggests that the production of support materials for NEfS advisors to use in this area could be beneficial.

Evidence of developing interfaces between cultures

In his discussion of 21st century learning challenges, Sawyer highlights the importance of diverse knowledge sources for promoting deeper learning. The preceding chapters built a picture of missed opportunities with regards to an explicit focus on different knowledge sources that could inform EfS and the potential synergies and tensions between them. Only about half of teachers believed that NEfS professional development had enhanced their understanding of Māori environmental knowledge, (Western) scientific knowledge and the relationships between them. It is hardly surprising then that students' outcomes related to understanding Māori concepts were amongst the least likely to be widely achieved when teachers were asked to consider all the students they worked with.

What has EfS enabled for Māori students in particular? In *Ka Hikitia* (Ministry of Education, 2008) there is an attempt to shift the focus of education from participation and success of Māori to participation and success as Māori. Surveys and case studies suggested that EfS principles and some EfS learning opportunities have created space for Māori students to bring their cultural knowledge to their learning, to enable Māori students to participate and contribute in ways that were important to their communities and for Māori whānau to become more involved in schooling. However, not all teachers or advisors we interviewed were particularly confident in incorporating Māori perspectives into their teaching without partnerships, and EfS advisors have had little impact in supporting schools to develop relationship with local iwi, hapū or marae. This presents challenges for maintaining the integrity of Māori knowledge and tikanga.

EfS encourages people to value and bring together different ways of knowing, being and doing to create a socially and environmentally just future. More may be needed for EfS learning outcomes to continue to build towards a “culturally inclusive society committed to protecting and enhancing our environment” as is espoused in *EfS Key Messages* (Ministry of Education, 2007b). We acknowledge that EfS advisors were perhaps attuned to “what we don't yet know” because discussion about cultural responsiveness had been a focus of their ongoing professional learning conversations.

A future-focused outcome to ponder

Student outcomes are not just a question of immediate outcomes for the students involved in EfS. EfS also has implications for *future* students yet to pass through New Zealand's formal education sector—that is by having more sustainable schools with more collaborative relationships students of the future will benefit. Perhaps this partly explains why the survey item worded “EfS is vital for today's society and future generations” gained the greatest proportion of “strongly agree” responses of any of the Likert scale items in the school survey.

Over two-thirds of primary teachers and about one-third of secondary teachers believed that their students had translated EfS learning experiences to their lives beyond school. These developments, including waste reduction, energy conservation, local food production and revegetation, are seen to contribute towards a more sustainable future. They signal initial steps towards the sorts of proactive whole systems “redesign” that might be required if we are to “do things differently in the first place, instead of just cleaning up the symptoms of underlying problems” (Parliamentary Commissioner for the Environment, 2004, p. 38).

8. Integrating the evidence—how well were regional EfS outputs met?

Having laid out all the evidence in the sequence suggested by Guskey’s evaluation logic, we now bring the various threads back together to discuss the heart of the evaluation in a more holistic way. This also enables us to answer the final evaluation subquestion 2f set out below.

Table 27: How question 2f was adapted for the NEfS initiative in particular

Main evaluation question (Q2)	Question and subquestions adapted to NEfS
How effective are the three initiatives in “operationalising” EfS key messages and achieving EfS goals in schools?	How effective are the NEfS Advisory Service’s operational practices at supporting EfS in schools, and what has it achieved in relation to EfS intentions expressed in Chapter 3?
Main evaluation subquestion (Q2f)	
f) To what extent have the initiatives achieved the goals and outcomes set out in their service agreements with the Ministry of Education?	To what extent has the NEfS Advisory Service met the six professional development outcomes set out in its regional output schedule?

This section evaluates how, and how well, the NEfS team has achieved the outcomes set out in their regional output schedule:

- Increase teachers’ pedagogical content knowledge and subject knowledge
- Change in teachers’ beliefs and practices to help all students become successful learners, especially those (at risk of) underachieving
- Build inclusive school cultures (which acknowledge the identity and diversity of all students)⁵⁷
- Build effective learning communities
- Teachers’ and schools’ reflective use of data, including student achievement data, for decision-making; and teachers and schools improve their practice and raise achievement through evidence-informed inquiry⁵⁸
- Schools have a plan to ensure developments can be sustained over time.

Increase pedagogical content knowledge and subject knowledge

Teachers work in very busy school environments and EfS comes in on top of their existing workload.⁵⁹ Despite this constraint the professional learning support from the NEfS Advisory Service has increased both the pedagogical content knowledge and the subject knowledge of participating teachers (Chapter 6). The teachers see the advisors as knowledgeable and good role models of what they hope the teachers will achieve (Chapter 5) and the advisors themselves are very strategic in how they structure professional learning opportunities to draw in as many teachers as possible within the constraints that they face (Chapter 4).

Specifically, EfS advisors have helped teachers to better understand what sustainability/EfS entails, including the broad intentions of EfS, and the holistic, interdependent and multifaceted nature of sustainability. However, a small number of

⁵⁷ New to 2008 schedule.

⁵⁸ We have grouped these two outcomes here; the second was new to the 2008 schedule.

⁵⁹ Only 3 percent of EfS primary school respondents and 14 percent of EfS secondary school respondents indicated that they had experienced some form of initial teacher training in EfS.

participants asked for access to greater and more up-to-date expertise on sustainability as this might be understood and/or practised by scientists and leaders in other fields. This suggests that greater discipline-based subject knowledge may be needed, particularly for teachers of senior secondary subjects and teachers responsible for leading EfS thinking in their school (Chapter 5).

EfS advisors are also successfully helping teachers learn about the ‘how to’ of teaching for EfS and how to aim for whole-school shifts towards more sustainable practices. The pedagogy that advisors used (Chapter 4) and teachers described (Chapters 6 and 7) appears to align extremely well with the seven aspects of effective pedagogy in *The New Zealand Curriculum* (Ministry of Education, 2007a, p. 34). Together, the advisors and teachers have worked to create learning opportunities that have at least some of the following features: meaningful and where possible authentic, co-constructed, collaborative/co-operative, inquiry-based and student-centred. As part of this work the advisors have worked as effective connectors of teachers and resources, including links to other initiatives that focus on EfS (Chapter 4).

Change in teachers’ beliefs and practices

EfS advisors set out to challenge teachers’ thinking about the nature and structure of schooling, and about sustainability (Chapter 4). Having both national and regional elements to the advisors’ work is a helpful structure because it provides a conduit between the policy environment (Chapter 3) and the micro-environments of the different schools (Chapters 5–7). Working together allows advisors to first explore and challenge their own thinking in ways they might not be able to access within their regional teams, where there may be only one or two of them working (Chapter 4).

All survey respondents agreed that EfS encourages effective teaching, but only just over half of them said they had actually made changes to their teaching approach, including adopting more facilitative teaching styles, enabling students to share decision-making, and providing learning opportunities that were more authentic, action-oriented, inquiry-based (Chapter 6) or cross-cultural (Chapters 6 and 7). There appear to be more barriers to achieving these types of changes in secondary schools, and interrelated with this, in larger schools (Chapters 5–7).

Most teachers indicated that learning in EfS contexts can contribute increased student engagement and motivation to learn. The focus on co-constructed inquiry, designed to raise students’ capacity to learn in ways that lead to action, can help students see themselves as successful learners, with flow-on benefits to other learning areas (Chapter 7). The case study data show benefits for students at risk of underachieving but there are also pointers suggesting this possibility may need to be more widely discussed. For example, where one secondary teacher had successfully implemented an environmental studies course for students at risk of failing NCEA,⁶⁰ another saw EfS standards that were too advanced for her class (Chapter 7).

Build inclusive school cultures for all students

Participatory decision-making, collaborative learning and acknowledgement of cultural diversity are key EfS principles that can collectively help build more inclusive school cultures (Chapter 3). Most teachers’ understanding of these has been strengthened, not least because the advisors set out to model these ways of working (Chapter 4) and to work alongside teachers in their classrooms where possible or encourage teachers to collaborate together, thus contributing to the deprivatisation of practice (Chapter 5). With support from EfS advisors, some teachers and school leaders are successfully building more inclusive school cultures with more democratic decision-making, but there are indications that this is easier to do in smaller schools (Chapter 5). Building greater knowledge of different cultural perspectives remains an area where more support is needed by both the advisors (Chapter 4) and the teachers (Chapters 5 and 7).

⁶⁰ A greater proportion achieved University Entrance than might have been expected.

Responses to survey items based on the aims of *Ka Hikitia* (Ministry of Education, 2008) suggest that EfS enables Māori students to contribute and build on their cultural knowledge in EfS learning opportunities (Chapter 7), although not all respondents chose to answer these questions. EfS appears to be particularly successful in meeting this aim when it works in conjunction with the Enviroschools initiative which has supported the case study primary schools to weave Māori perspectives into their curriculum and to develop particular topics drawing on Māori knowledge in a less tokenistic or surface way than has been used in the past (Chapter 7).

Build effective learning communities

Advisors would rather establish professional learning communities within schools than work with teachers in isolation or solely at one-off workshops (Chapter 4) but they are more likely to succeed in doing so, in primary schools, where it is easier to embed the ideas and practices across the whole school, both in terms of staff involvement and structural changes (Chapter 5). This is related to school size but also to the differences between the ways primary and secondary schools are organised. Secondary teachers may have only one or two sustainability classes, or may express their support for EfS through extracurricular programmes that they can organise unilaterally (Chapters 6 and 7). Despite the constraints, EfS advisors do appear to have positively impacted on collaborative learning relationships within and beyond schools, and have supported many schools to develop a shared vision for EfS that infuses the whole school from high-level documents to specific teaching units (Chapter 5). Both primary and secondary interviewees suggested that they had gained new insights for their own teaching by interacting with teachers from other year levels and learning areas through attending EfS professional development and/or through developing EfS in their school as supported by an EfS adviser (Chapter 5).

The structure of the initiative allows the EfS advisors to work as a professional learning community of their own, pushing boundaries at the leading edge of change. National hui, working groups and other professional development opportunities enable advisors to exchange their locally-generated ideas and access external expertise (Chapter 4). The advisors benefit from having dedicated national EfS coordinators responsible for leading professional learning and national-level relationships with the Ministry of Education, advisory bodies and other EfS providers (Chapter 3). They are well positioned to access School Support Services institutional knowledge and to collaborate with advisors working in other areas, although this potential is underdeveloped in some regions (Chapters 3 and 4).

Raising achievement through evidence-informed inquiry

The concept of EfS achievement, as well as ways to measure the impact of EfS contexts/content/pedagogy is developing and contested, partly because it is an extremely difficult task (Chapter 3). Both advisors and teachers feel they need more knowledge and skills in this area and this theme has repeatedly surfaced at different points in the evaluation (Chapters 4–7). However, all the case study teachers we spoke to had developed ways and means to understand EfS achievement and/or achievement in learning areas where they had integrated EfS, and several included students in self-reflection/assessment. Likewise, the survey teachers were aware of the outcomes they had successfully supported and those where they had not yet provided opportunities to learn (Chapter 7). Advisors had developed a range of reflective data capture tools and documentation strategies and were encouraging teachers to use these (Chapters 4 and 7). The new EfS standards have paved the way for standardised quantitative assessment of selected outcomes for students in the senior secondary school but this can only partially address the whole range of possible EfS outcomes. The advisors are also engaged in other development work to support evidence-informed inquiry for EfS. As we will discuss in the final chapter, the NEfS team is asking—and responding to—pertinent questions about how to appropriately assess transformational learning, thus making a valuable contribution towards education fit for the 21st century.

Planning for sustainability over time

Advisors' descriptions of "good EfS" involve schools embedding EfS across a whole school and continually developing EfS into the future (Chapter 4). Many school respondents felt they were just beginning to engage with what this could mean, and others who had been working on EfS for a while felt progress was slow or inconsistent (Chapter 5). The surveyed schools had embedded EfS to varying degrees through high-level documentation, shared commitment to EfS beyond the lead teacher (eg, by principals and other staff) and established ongoing school-to-school and community collaborations (Chapter 5). These changes point to the potential for EfS to become embedded to the point that it can be carried by institutional culture but again there are indications that this is easier to achieve in small schools and in primary schools.

The secondary school survey responses point to a failure to date to embed EfS beyond an EfS lead teacher and perhaps a small number of enthusiasts (Chapters 5 and 7). There are obvious implications here for sustainability. The case study secondary school appeared to be further ahead with EfS than many secondary schools, yet more than one interviewee expressed concern that EfS would not continue if competing priorities continued to take centre stage and/or if one or more of the key teachers left. Similarly, staff at the case study primary school, while recognised as a leader in the region, still felt they had a lot to learn and still needed the input from the EfS adviser and the local cluster to continue their EfS developments. Again, this makes sense considering the complex nature of EfS and its transformational goals.

9. Future directions for NEfS

This chapter provides a response to our final evaluation question by discussing future directions for the NEfS initiative, on its own and in relation to the companion Enviroschools initiative.

Table 28: How Q3 was adapted for the NEfS initiative

Main evaluation question (Q3)	Question adapted to NEfS (Q3)
What are the future directions for school-based Education for Sustainability in relation to current and potential goals?	
Main evaluation subquestions (Q3a, b)	
(a) What are the key areas that require further development within each of the initiatives?	What is potential future for NEfS, and what external support and further developments may be needed to achieve this potential?
(b) What could the Ministry of Education do to support the ongoing development of Education for Sustainability in the New Zealand context?	

In Chapter 9 we outline participants' views about the future of the initiative and also use the overall analysis to make some recommendations of our own. Given the strong alignment between EfS principles and goals and those of *The New Zealand Curriculum* (Ministry of Education, 2007a), we suggest synergies that could be further exploited. We also return in particular to the vexed question of assessment and the documentation of learning in EfS. This has come up in almost every chapter as an issue and the dilemmas described have strong parallels in other assessment debates currently taking place—for example how one might assess the key competencies (Carr, 2008; Hipkins, 2007). Again, there are synergies with the implementation of *The New Zealand Curriculum* that could be used to create greater leverage for the resources expended.

How participants saw future developments for EfS

Just about all interviewees, including School Support Services managers, were encouraged by the opportunities that *The New Zealand Curriculum* offers for the further growth and impact of EfS. A long-term vision for EfS, aspects of which echoed through many interviewees' narratives, was nicely summed up by one of the national co-coordinators:

[EfS would be] an overarching development in education. We've not got EfS as a main learning area but it should be a key aspect that could underpin all education, especially a multidisciplinary approach to secondary. It would be a new approach to learning—that not only changes what we teach but reorients how schools operate—so that the structure and nature of schools model more sustainable approaches. I'm not arguing for another learning area, but it should be an option for students to specialise in EfS where they can bring it all together and action their learning ... It's a complete redesign of education, and EfS will have influenced that immensely. The day we stop talking about sustainability is the day we've got there—it's part of our value sets, it's part of the way we live, it infiltrates everything we do. Then we'll know we're truly on a pathway to a sustainable future. (National co-coordinator)

Both national co-coordinators suggested that the ultimate future for EfS Advisory, if EfS was truly embedded, would possibly be nonexistence in the very long term.⁶¹ Meantime, with many goals still to achieve, they could see that ongoing role for the EfS Advisory team was needed to help schools maintain the integrity of EfS expertise and concepts:

⁶¹ This seems very optimistic, given the toe-hold we have described for EfS in some of the participating secondary schools, in particular.

Ideally there would be no need for it because everyone would be doing EfS ... We probably still need some experts ... but we need a positive approach to developing EfS and how it would grow. (National co-coordinator)

It would be great if there was not a separate EfS Advisory team but that EfS was implicit in all advisors', teachers' and schools' roles. (National co-coordinator)

Various suggestions were made concerning changes in relation to EfS Advisory work that could move schools in sustainable ways towards the vision for transformative change described in the preceding chapters. These suggestions have been organised into themes as follows.

Strengthen the mandate for EfS

Given the importance to New Zealand's economic and environmental wellbeing of living more sustainably, many participants in this research hoped for a stronger formal mandate for EfS, backed up with the necessary levels of resources and support to ensure the mandate can be enacted. Suggestions included expanding the Advisory Service at both national and regional levels to meet current demand, generating greater interest and helping EfS reach critical mass in schools.

Another action that several teachers and advisors suggested could help here is to make EfS integral to pre-service teacher education. Not only would teachers enter the profession with a deeper understanding of effective pedagogy across the whole curriculum, they could be a force for change in those schools, in much the same way as beginning teachers were for the paradigm shift to an outcomes-based curriculum in the 1990s. Another benefit would be that the pool of potential EfS advisors would be increased.

The stakeholders we interviewed proposed a dedicated communication role at the national level of the EfS Advisory Service to showcase NEfS and EfS achievements, including to potential funding partners. They also wanted to see EfS guidelines developed to step off from the *Guidelines for Environmental Education* (Ministry of Education, 1999), and they were keen to find ways to dovetail EfS with sustainable business and sustainable households projects. All these actions could strengthen the mandate for EfS.

Leverage links to *The New Zealand Curriculum*

Both teachers and advisors would like more resources that link EfS to *The New Zealand Curriculum* (Ministry of Education, 2007a), together with professional learning opportunities to help more teachers understand the potential of EfS as a vehicle to give effect to the new curriculum, and the curriculum as a key driver for EfS.

Maximise benefits of collaboration

EfS advisors already work collaboratively with each other (as a national team) and with other School Support Services advisors where they can. This has proved a good means of developing shared resources and could be further strengthened by establishing a national office and making more time for advisors to be able to collaborate to complete national tasks.

It could be timely to evaluate the relationship between national and regional output schedules and associated management and governance relationships. The suggestion was also made that the Ministry of Education reconsider organisational structures at the regional level to ensure greater coherence and shared learning between the regions. Greater collaboration between School Support Services advisors working in different curriculum areas could allow delivery models to model the more integrated approach to learning suggested by *The New Zealand Curriculum*.

At their best, the NEfS and Enviroschools initiatives can work synergistically to strengthen the outcomes of both programmes.⁶² Finding ways to more deliberately achieve such synergies across a wider range of outcomes seems highly desirable.

Continue with, and strengthen, the current professional learning focus

Case study interviewees greatly appreciated the professional development and support from EfS advisors. Many looked forward to continuing to draw on their expertise, guidance and facilitation as the schools continued to develop EfS as the creative “hub of the community” supporting sustainable design and generating sustainability knowledge. Several interviewees and survey respondents made suggestions for how NEfS could strengthen its work with schools. Others simply pointed out that the advisors were doing an excellent job as is and/or provided suggestions for the school or the Ministry of Education instead. We have combined these suggestions as follows:

- Maintain EfS advisors’ profile and proactively encourage more schools and staff to attend workshops and seek one-on-one support.
- Set up a range of communication strategies (such as e-groups, Google groups and blog sites for particular learning areas and/or year levels) to inform schools of: EfS developments, success stories, innovative student initiatives; new resources; and professional learning opportunities, and to enable schools to share with each other.
- Prepare and circulate EfS curriculum resources and practical unit plans that teachers can adapt to their context.
- Develop moderated assessment materials at senior level, and/or provide a database of relevant unit and achievement standards from various learning areas.
- Develop a greater understanding of Māori heritage and connection to the land.
- Engage principals, boards of trustees, curriculum leaders, EfS lead teachers and a wide range of staff in an ongoing way to develop collective visions and support detailed school and curriculum/unit planning.
- Spend more time working deeply alongside teachers in their school/class and offer more school cluster meetings.
- Look into “funding pool” options and co-ordination, so that NEfS could fund basic sustainability projects themselves and/or provide a coordinator who could apply for funding on behalf of schools.

Our perspectives on future developments

On the basis of the evaluation data we support many of the suggestions made above. We also offer several recommendations of our own, grounded in our understanding of the challenging nature of transformative change laid out in the research literature and used to develop our analytic framework.

Support ongoing change in ways sustainability is conceptualised

A challenge for the NEfS advisors is to continue moving the sustainability narrative from a harm-minimisation orientation towards a more positive future-focus on regeneration, innovation and active citizenship. Aligned with this, conversations and understanding that locate EfS as a “thing” could evolve towards locating EfS as a way of being that does not need a label.

Use *The New Zealand Curriculum* links to deepen insights about changes to schooling

We endorse the advisors’ and teachers’ recommendation related to leveraging links to the implementation of *The New Zealand Curriculum*. However, we are also aware that this framework document is open to a range of interpretations. It

⁶² See the overall evaluation report (Eames, Roberts, Cooper & Hipkins, in press) for a discussion of evidence in relation to this claim.

can be seen as providing a mandate for improving current practice, or it can be taken as a mandate for transformative change. Clearly EfS aligns with the latter but the necessary changes will not be achieved unless school leaders, teachers and indeed everyone with an active interest in education, has opportunities to examine deep beliefs about the nature of learning and purposes of schooling in the 21st century, with associated implications for changes in long-established school structures and practices. To this end EfS provides rich opportunities to support teachers and school communities to think more deeply about the purpose and potential of:

- curriculum integration (eg, so that students experience the opportunities they need to develop the systems thinking that could help them live more sustainably, now and in the future)
- “21st century learning” messages, with their new ways of thinking and talking about the nature of learning, with associated implications for changing pedagogies
- school-wide decision-making, including ways the school structures and habitual practices signal values that may or may not align with the aim of creating more sustainable futures
- interactive school–community links, including community involvement in determining and supporting curriculum directions
- the types of outcomes to be valued at different levels of the school system, and whether or not what actually happens in schools supports or hinders their attainment in practice (e.g., the nature of “competency” in relation to sustainability, and whether or not differences are to be expected in primary and secondary school outcomes).

Advisors with a deep understanding of the sustainability literature, coupled with expertise in managing adult learning for transformative change, are well placed to be at the forefront of such conversations.

Continue to resource and develop sustainability initiatives

We acknowledge that the Ministry of Education is faced with a range of sector groups who think their message is the most important to schools. On the basis of the evidence outlined in this report and the accompanying overall evaluation, which shows how EfS initiatives offer a proactive response that also aligns extremely well with the intentions of *The New Zealand Curriculum* and leading educational theory, we suggest that EfS should continue to be given high priority and resourced accordingly. The NEfS initiative needs support and visionary leadership to continue and strengthen its impact, and also to be recognised as offering a paradigm shift in the role of education to better prepare us for an uncertain future. Attempting to turn the tide, and it is not an easy task, calls for mutually supporting actions.

Some questions of ongoing curriculum development would be best addressed with Ministry of Education co-ordination and perhaps ongoing research. Areas for investigation could include a mapping of early childhood–primary–secondary–tertiary curriculum messages in relation to sustainable education and a sustainable future. Should the approaches be different at each of these levels? Why or why not? How do we ensure they align to create coherent learning experiences and pathways, with appropriate levels of resources and support? (This question has particular saliency at the secondary school level, where we have reported many indications that change is harder to achieve.) The current review of the *Guidelines for Environmental Education*, with the associated development of new resources that relate EfS to *The New Zealand Curriculum*, and the ongoing construction and review of the EfS website, all provide opportunities to address these questions and to leverage greater change.

Proactively address the assessment challenge

The challenges raised by the imperative to make evidence-informed decisions have been a recurring theme throughout this report. Assessment challenges associated with the demonstration of learning-in-action are not exclusive to EfS (there are strong parallels to debates about assessment of key competencies for example) but EfS does provide accessible and motivating contexts in which these challenges could be proactively addressed. The following diagram is

an attempt to clarify the nature of the challenges that wait to be explored. The core of the model was presented as part of discussion of key competencies in the European context and intended to highlight the interplay between the “deeply personal and private (sense of identity, desire and motivation) and the highly public and formally assessable” (Deakin Crick, 2008, p. 314). We have added the grey shaded row that identifies the assessment challenges as we understand them.

Figure 16: A summary of the assessment challenges inherent in EfS (or any other participatory learning)

Self ←		→ Competent agent	
Identity	Dispositions	Skills	Competent learner
Desire	Values	Knowledge	Citizen, mathematician, scientist etc.
Motivation	Attitudes	Understanding	
Little history of assessment Judgement is personal—others can only infer meaning from observed actions		Areas with a strong assessment history (and hence methods, research traditions etc.)	Situated, contextualised assessment challenges reliability conventions
Personal ←		→ Public	

(After Deakin Crick, 2008)

There is a clear implication here that students need to be actively involved in the assessment of the private aspects of their learning progress in EfS. However, while Deakin Crick identifies both the right-hand columns as formally assessable, we think a different set of challenges present when learning is situated, and models of good assessment practice are just as much needed at this end of the continuum as at the other. Any research carried out in this area has the potential to be world-leading, but also to strengthen a range of emergent changes in curriculum thinking and pedagogy in relation to the implementation of *The New Zealand Curriculum* (another example is in the area of learning-to-learn). There are synergies and potentially powerful drivers of change here that the Ministry of Education might wish to further explore.

References

- Blanchet-Cohen, N. (2006, April). *Rainbow warriors: The unfolding of agency in early adolescents' environmental involvement*. Paper presented at the American Educational Research Association, San Francisco.
- Bolstad, R., Baker, R., with Barker, M., & Keown, P. (2004). *Environmental education in New Zealand schools: Research into current practice and future possibilities. Volume 2: A review of national and international research literature on environmental education practices*. Wellington: New Zealand Council for Educational Research and University of Waikato, for the Ministry of Education.
- Carr, M. (2008). Zooming in and zooming out: Challenges and choices in discussions about making progress. In J. Morton (Ed.), *Making progress, Measuring progress conference proceedings* Wellington: NZCER Press.
- Christchurch College of Education. (2006). *EfS national co-ordination team strategy 2006–2008*. Unpublished document.
- Deakin Crick, R. (2008). Key competencies for education in a European context: Narratives of accountability or care. *European Educational Research Journal*, 7(3), 311–318.
- Duignan, P. (2004). *Intervention logic: How to build outcomes hierarchy diagrams using the OH diagramming approach*. The Strategic Evaluation website. Retrieved 15 December 2007, from <http://www.strategievaluation.info/se/documents/124pdff.html>
- Fullan, M. (2003). *Change forces with a vengeance*. London: Routledge Falmer.
- Gilbert, J. (2005). *Catching the knowledge wave? The knowledge society and the future of education*. Wellington: NZCER Press.
- Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.
- Guskey, T. R. (2002). Professional development and teacher change. *Teachers and teaching*, 8(3/4), 381–391.
- Hipkins, R. (2007). *Assessing key competencies: Why would we? How could we?* Wellington: Ministry of Education. Retrieved 10 February 2009, from http://nzcurriculum.tki.org.nz/implementation_packs_for_schools/assessing_key_competencies_why_would_we_how_could_we
- Istance, D., & Kobayashi, M. (2003). Introduction. In D. Istance & M. Kobayashi (Eds.), *Networks of innovation: Towards new models for managing schools and systems*. (pp. 9–29). Paris: OECD.
- Jensen, B. B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental Education Research*, 8(3), 325–334.
- Jickling, B., & Wals, A. E. J. (2007). Globalization and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies*, 40(1), 1–21.
- Malone, K., & Tranter, P. J. (2003). School grounds as sites for learning: Making the most of environmental opportunities. *Environmental Education Research*, 9(3), 283–303.

- Ministry for the Environment. (1998). *Learning to care for our environment: A national strategy for environmental education*. Wellington: Author.
- Ministry of Education. (1993). *The New Zealand curriculum framework*. Wellington: Learning Media.
- Ministry of Education. (1999). *Guidelines for environmental education in New Zealand schools*. Wellington: Learning Media.
- Ministry of Education. (2007a). *The New Zealand curriculum*. Wellington: Learning Media.
- Ministry of Education. (2007b). *Request for proposals: Evaluation of Education for Sustainability*. Unpublished document.
- Ministry of Education. (2007c). *Statement of intent 2007–2012*. Wellington: Author.
- Ministry of Education. (2008). *Ka hikitia*. Wellington: Author.
- Monroe, M., & Fleming, M. (2005). Evaluators as educators: Articulating program theory and building evaluation capacity. *New Directions for Evaluation*, 108, 57–71.
- Parliamentary Commissioner for the Environment (2004). *See Change: Learning and education for sustainability*. Wellington: Author.
- Patton, M. (2008). *Elaboration of developmental evaluation*, expanded from the book *Getting to maybe: How the world is changed*. (4th ed.) Random House Canada, 2006 and Utilization-Focused Evaluation.
- Rogers, P., & Huebner, T. (2000). Program theory evaluation: Practice, promise, and problems. *New Directions for Evaluation*, 5–13.
- Sawyer, K. (2008). Optimising learning: Implications of learning sciences research. In Centre for Educational Research and Innovation (Ed.), *Innovating to learn, learning to innovate*. Paris: Organisation for Economic Development.
- Schagen, S., & Hipkins, C. (2008). *Curriculum changes, priorities, and issues. Findings from the NZCER secondary 2006 and primary 2007 national surveys*. Wellington: New Zealand Council for Educational Research.
- Sterling, S. (2001). *Sustainable education: Re-visioning learning and change*. Bristol: Green Books.
- Stoll, L., & Louis, K. (2007). Professional learning communities: Elaborating new approaches. In L. Stoll & K. Louis (Eds.), *Professional learning communities: Divergence, depth and dilemmas* (pp. 1–13). Berkshire: Open University Press.
- Tilbury, D., Coleman, V., & Garlick, D. (2005). *A national review of environmental education and its contribution to sustainability in Australia: School education*. Canberra: Australian Government Department of the Environment and Heritage and Australian Research Institute in Education for Sustainability (ARIES).
- Tilbury, D., & Wortman, D. (2005). Whole school approaches to sustainability. *Geographical Education*, 18, 22–30.
- Timperley, H., Phillips, G., & Wiseman, J. (2003). *The sustainability of professional development in literacy: Parts one and two*. Wellington: Ministry of Education.

Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development: Best evidence synthesis iteration* (BES). Wellington: Ministry of Education.

UNCED. (1992). *Agenda 21*. Retrieved 10 July 2007, from www.unesco.org/education/English/chapter/chapter.shtml

UNESCO. (2007). *Education for sustainable development*. Retrieved 20 July 2007, from http://portal.unesco.org/education/en/ev.php-URL_ID=23280&URL_DO=DO_TOPIC&URL_SECTION=201.html

Appendix A: Questionnaires

Please give this to the person who is responsible for (or most involved in) environmental/sustainability education in your school.



P O Box 3237, Wellington 6000
New Zealand
Education House
178-182 Willis Street
Telephone: +64 4 384 7939
Fax: +64 4 384 7933

Code: []

Dear lead teacher/coordinator of Environmental Education (EE) or Education for Sustainability (EfS),

I would like to invite you to contribute to an important evaluation about professional development in Education for Sustainability (also known as Environmental Education). You are part of a sample of schools that had some form of support from School Support Services EfS advisors during 2007–2008 (PTO for a list of these advisors). You and/or your colleagues may have, for example, attended a workshop related to environmental education, worked one-on-one with an adviser, or attended a school meeting with an adviser.

Our aim is to understand the nature of EfS professional development, to assess and enhance the effectiveness of it, and to feed into the ongoing development of EfS in New Zealand schools and kura. This work has been requested by the Ministry of Education as part of an overall evaluation of School Support Service EfS Advisory, Enviroschools, and Mātauranga Taiao.

We expect that this questionnaire will take 30 minutes to complete. If you're happy to participate, return of your completed questionnaire (post or fax) will be taken as consent to use the information you provide. Your responses will be treated confidentially and your data will be stored securely and reported anonymously.

Data collected from you may be used in writing reports, publications or in presentations, including for the Ministry of Education and School Support Services—we will not name you or your school. We are required to gain permission from the Ministry of Education for any publication concerning this evaluation.

If you have any questions regarding this study, please contact me at NZCER, josie.roberts@nzcer.org.nz or 04 802 1431. For any unresolved issues, please contact project manager Dr Chris Eames, University of Waikato, Ph 07 838 4357, email c.eames@waikato.ac.nz

Completed surveys are eligible to win one of three \$50 book vouchers—to enter the draw please provide contact details on the back of this coversheet. Good luck! We can also send you a summary of the findings.

Thank you for your contribution to this important area. We appreciate your time and thought.

Yours sincerely,

Josie Roberts (Researcher at NZCER and leader of the EfS School Support Services evaluation)

Complete the survey by ticking bubbles, circling numbers, and writing in boxes.

**Please return it by 15 November to Josie Roberts
by fax (04 384 7933) or by post in the prepaid envelope
(NZCER, PO Box 3237, Wellington)**

Confidential Information

- Please put me in the draw to win a \$50 book voucher! (*tick for yes*)
- I'd like to be emailed a summary of the findings (*tick for yes*)
- I'm happy to be contacted in the future, if NZCER carries out more research relevant to this topic (*tick for yes*)

If you said YES to any of the above, please complete the following:

Name (please print):

School:

Email:

Address

Phone :.....

The winner of the draw will be notified by 25 December 2008

List of Schools Support Services EfS advisors from the past two years

Don't worry if you have trouble remembering names, we will not ask you to indicate the individual(s) that you may have worked with.

Team Solution—Tai Tokerau Auckland College of Education Team Solution—Auckland Auckland College of Education School Support Services Waikato University	<i>Names removed for report</i>
School Support Services Massey University School Support Services Victoria University Education Plus School Support Services Christchurch College of Education School Support Services (Dunedin College of Education) Otago University	

A) Background

Please note: For the purpose of the survey “education for sustainability” (EfS) covers “environmental education” (EE) or any similar terms that your school may use.

1. Are you currently an EfS leader/co-ordinator/lead teacher at your school?

- ¹ Yes - for many years have you been an EfS lead teacher? _____
- ² No - how you are involved in EfS? _____

2. What is your role in your school?

- | | |
|--|---|
| <input type="radio"/> ^f Principal | <input type="radio"/> ^g Deputy/Assistant/Associate principal |
| <input type="radio"/> ^h Curriculum/syndicate leader | <input type="radio"/> ⁱ Head of department/faculty |
| <input type="radio"/> ^j Classroom teacher/subject teacher | <input type="radio"/> ^k Other, please describe: _____ |

3. What is your total teaching experience?

- ¹ Less than 2 years ² 2–5 years ³ 6–10 years ⁴ 11–15 years ⁵ 16 or more years

4. How many years have you been involved in environmental/sustainability education? (Include time at any school where you have worked)

- ¹ Less than 2 years ² 2–5 years ³ 6–10 years ⁴ 11–15 years ⁵ 16 or more years

5. What education/training have you had in EfS?

- ^a No education/training in EfS
- ^b Initial teacher training, e.g. undergraduate papers in EfS
- ^c In-service teacher training, e.g. EfS professional development
- ^d Relevant postgraduate study, e.g. Masters papers in environmental studies
- ^e Experience working for an environmental organisation

6. Which of the following statements best describes your schools' EfS developments?

- ¹ We are just beginning with EfS
- ² We have been working on EfS for a while, but progress has been slow or inconsistent
- ³ We have been embedding EfS steadily, and have made good progress but still have a long way to go
- ⁴ We consider ourselves to be a leader in the field even though it is an ongoing journey

7. Indicate how strongly you agree or disagree with the following statements for your school:

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) A range of year levels are involved in EfS	1	2	3	4	5
b) Most students are involved in EfS	1	2	3	4	5
c) There is a shared vision for how EfS might develop	1	2	3	4	5
d) EfS is embedded in documents, planning and infrastructure	1	2	3	4	5
e) All staff are encouraged to attend professional development in EfS	1	2	3	4	5
f) Staff discuss EfS in the staff room or in meetings	1	2	3	4	5

8. How many years has your school been doing some form of environmental or sustainability education? (please estimate to the best of your knowledge)

- ¹ Less than 2 years ² 2–5 years ³ 6–10 years ⁴ 11–15 years ⁵ 16 or more years

9. For how many years has the school (at least one teacher) had support from EfS providers? (e.g. EnviroSchools, DOC, WWF, regional council, Royal Society). If you have had a combination of support circle more than one line.

	Less than 1 year	1–2 years	3–4 years	5 or more years	Don't know	No support
a) School Support Service EfS adviser(s)	1	2	3	4	5	6
b) EnviroSchools	1	2	3	4	5	6
c) Other environmental/sustainability providers/programmes, please list below:	1	2	3	4	5	6
_____	1	2	3	4	5	6
_____	1	2	3	4	5	6
_____	1	2	3	4	5	6

10. Please indicate how strongly you agree with the following statements about your experience with two providers: EfS School Support Services EfS advisors AND Enviroschools.

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) We have had better access to one provider than the other	1	2	3	4	5
b) Each provider offers different strengths (or one is better matched to our needs)	1	2	3	4	5
c) The two providers appear to work well together	1	2	3	4	5

11. How useful have you found the following for developing EfS in your school/teaching?

	Very useful	Useful	Slightly useful	Not useful	Not used
a) Enviroschools kit	1	2	3	4	5
b) Environmental Education Guidelines (1999)	1	2	3	4	5
c) The new NZ Curriculum (2008)	1	2	3	4	5
d) EfS website (now part of TKI)	1	2	3	4	5
e) Resources from other organisations (e.g. DOC, councils, businesses)	1	2	3	4	5

B) Support from: School Support Services (SSS)

This section is **ONLY** about School Support Services EfS advisors (see adviser list, pg.2)

Please do not consider support you have had from Enviroschools or other EfS providers.

12. Over the past two years, what proportion of the teaching staff has had some form of professional development from a School Support Services EfS adviser? [tick one only]

¹ One teacher

² Some teachers

³ All teachers

13. Which other people in the school received direct support from a SSS EfS adviser?

^a School leaders (principal/managers)

^b Caretaker

^c Board of Trustees

^d Students

^e Others, please describe: _____

14. Please indicate which kinds of School Support Services EfS professional development you have personally experienced and how useful you found each one?

	Very useful	Useful	Slightly useful	Not useful	Not used
a) PD for your region/cluster, attended by staff from a range of schools	1	2	3	4	5
b) PD for your school, attended by several staff from within your school	1	2	3	4	5
c) Individual one-on-one PD/support for you	1	2	3	4	5
d) Please describe and rate any other SSS EfS professional development:	1	2	3	4	5

15. Please give an assessment of the School Support Services EfS adviser who most recently worked with you or your school?

<i>The adviser...</i>	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) demonstrated good facilitation skills	1	2	3	4	5
b) was well organised and professional	1	2	3	4	5
c) was available when I needed them (during and after session/s)	1	2	3	4	5
d) was collaborative, encouraging two-way learning between adviser and teachers	1	2	3	4	5
e) demonstrated a good understanding of environmental issues and sustainability	1	2	3	4	5
f) demonstrated a good understanding of the national/school curriculum	1	2	3	4	5
g) demonstrated a good understanding of how schools work	1	2	3	4	5
h) demonstrated a good understanding of effective teaching and learning	1	2	3	4	5

16. a) Please give an overall assessment of all the School Support Services EfS professional development you have been part of:

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) It has been an enjoyable learning process	1	2	3	4	5
b) It challenged my thinking	1	2	3	4	5
c) It was practical	1	2	3	4	5
d) It modelled how I might work with my students	1	2	3	4	5
e) It informed me of people or groups that might offer EfS help	1	2	3	4	5
f) It informed me of relevant physical/web-based resources	1	2	3	4	5
g) It led me to reflect on the purpose, nature, or structure of schools/education	1	2	3	4	5
h) It led me to incorporate more environmental/sustainability content into my lessons	1	2	3	4	5
i) It led me to make changes to my teaching style	1	2	3	4	5

b) If you **disagreed with any of these**, please note the item (a - i) you most strongly disagree with and explain why you disagree:

c) For any answer you gave to (b), what do you think could be done to improve the situation?

17. Has support from School Support Services EfS advisors helped develop EfS in the school in any of the following ways? [If yes, tick all that apply]

- ^a As an extra/co-curricular activity or group
- ^b As a separate interdisciplinary EfS course, subject, or module
- ^c As an integrated theme across syndicate or school
- ^d Included in all learning areas
- ^e Included in one or more (but not all) learning areas—if so, tick which ones below:

- ^f English or languages
- ^g Mathematics
- ^h Science
- ⁱ Technology
- ^j Social Sciences
- ^k The Arts
- ^l Health and physical wellbeing
- ^m Other, please describe _____

18. Please indicate how strongly you agree or disagree with each of the following:

Being involved in professional development with School Support Services EfS advisors has helped me to better understand...	Strongly agree	Agree	Disagree	Strongly disagree
a) The general purpose and principles of EfS	1	2	3	4
b) The role of School Support Service EfS advisors	1	2	3	4
c) The role of other EfS providers, such as EnviroSchools	1	2	3	4
d) NZ's Environmental Education Guidelines (1999)	1	2	3	4
e) Environmental aspects of sustainability	1	2	3	4
f) Socio-cultural aspects of sustainability	1	2	3	4
g) Economic aspects of sustainability	1	2	3	4
h) Interdependence of environmental, social, cultural, political, and economic aspects	1	2	3	4
i) [Western] Scientific environmental knowledge	1	2	3	4
j) Māori environmental knowledge	1	2	3	4
k) Relationships between Māori and Western knowledge (inc. similarities/differences)	1	2	3	4
l) How EfS relates to the front end of the NZ curriculum (ie, vision, principles, key competencies, future focused issues)	1	2	3	4
m) How to run a specific EfS project or unit	1	2	3	4
n) Teaching and learning approaches suited to EfS	1	2	3	4
o) How to support students to make decisions on what and how to learn	1	2	3	4
p) How to support student-planned action(s)	1	2	3	4
q) How my school can become environmentally sustainable	1	2	3	4
r) How I can personally become more environmentally sustainable	1	2	3	4
s) How to document students' learning in EfS	1	2	3	4
t) How to assess students' EfS learning/achievement	1	2	3	4
u) How to monitor progress towards becoming a sustainable school	1	2	3	4

C) Impacts on teaching and the school

19. To what extent do you think support from SSS advisors has impacted on the following potential changes in your school? (This could be from them directly helping you to do it, or from initially doing PD with an EfS adviser then going your own way or becoming inspired to try something else)

	Strong positive impact	Some positive impact	No impact	Negative impact	Don't know
a) Included or strengthened EfS in high-level documents (e.g. school vision, strategic plan, or curriculum plans)	1	2	3	4	5
b) Increasing environmental/sustainability content in the school curriculum	1	2	3	4	5
c) Providing more EfS learning opportunities/programmes for students	1	2	3	4	5
d) Designing units/projects around the unique needs/location of the school	1	2	3	4	5
e) Enabling more student-centred learning and facilitative teaching approaches	1	2	3	4	5
f) Getting more staff interested and involved in EfS	1	2	3	4	5
g) Strengthening school leadership support and vision for EfS	1	2	3	4	5
h) Developing more participatory school decision-making processes	1	2	3	4	5
i) Building more collaboration between teachers	1	2	3	4	5
j) Developing relationships with EfS providers/environmental organisations	1	2	3	4	5
k) Developing relationships with local iwi/hapu/marae	1	2	3	4	5
l) Developing relationships with other community members/groups	1	2	3	4	5
m) Collaborating with other schools on EfS or local sustainability initiatives	1	2	3	4	5
n) Reorienting school structures to provide opportunities for EfS (e.g. timetables)	1	2	3	4	5
o) Improving the school's sustainability practices (e.g. recycling, carbon neutrality)	1	2	3	4	5
p) Improving the school's natural environment (e.g. planting in school grounds)	1	2	3	4	5
q) Reflecting on data to refine approaches to EfS (at a teacher or school level)	1	2	3	4	5
r) Assessing student learning in EfS	1	2	3	4	5
s) Providing more relevant and authentic learning experiences for students	1	2	3	4	5

20. Please describe the main difference(s) you have made to your teaching as a result of School Support Services EfS professional development:

21. Outside of teaching, please describe the main change(s) that has happened at the school as a result of School Support Services EfS professional development:

D) Student outcomes

What do students experience and achieve through EfS in your school

Think of one 2008 unit of work or learning experience your students were (or are) involved in that exemplifies your approach to EfS (e.g. it may be a specific project/unit, an extracurricular activity, or an integrated theme). Please answer this page in relation to this learning experience.

22. Which year level(s) were/are the students? (tick all that apply)

- ^aYear 0–3
 ^bYear 4–6
 ^cYear 7–8
 ^dYear 9–10
 ^eYear 11–13

23. Please briefly describe the class, activity, project, or unit of work:

24. Please indicate how strongly you agree or disagree with the following statements about students' learning outcomes.

Through this project/activity/unit, I believe students...	Strongly agree	Agree	Disagree	Strongly disagree
a) Developed their understanding about the biophysical environment	1	2	3	4
b) Questioned and researched about a specific environmental issue or strategy	1	2	3	4
c) Questioned and learned about big picture sustainability themes like social justice, ecological sustainability, cultural diversity, wealth distribution, globalisation	1	2	3	4
d) Developed an understanding of relationships between local, national, and global sustainability	1	2	3	4
e) Built up a picture of a complex phenomenon and change processes	1	2	3	4
f) Felt overwhelmed and disempowered about sustainability issues	1	2	3	4
g) Made key decisions about what to study or how to undertake actions	1	2	3	4
h) Developed their critical thinking skills	1	2	3	4
i) Clarified their ethics and values in relation to sustainability	1	2	3	4
j) Drew on, or developed their understanding of, Māori concepts	1	2	3	4
k) Reflected on their personal understandings of sustainability	1	2	3	4
l) Imagined the future	1	2	3	4
m) Worked with environmentally focused partners (e.g. local government, iwi, sustainable business, NGOs)	1	2	3	4
n) Took action for sustainability (e.g. addressed an environmental issue)	1	2	3	4
o) Used a variety of knowledge systems or disciplines to understand a sustainability issue (e.g. science, health, Māori knowledge, etc)	1	2	3	4
p) Increased their engagement, interest, or motivation in learning	1	2	3	4
q) Changed their lifestyle or practices outside of school as a result (see below)	1	2	3	4

25. If you agreed with item (q) above: What changes have your students made in their lives that you have noticed or heard about (e.g. in their family, out of class, etc)?

26. Environmental Education Guidelines (1999) have the following 5 aims for students. Please rate how well your students have developed each through EfS opportunities at your school.

	A lot better	A little better	No different
a) Awareness and sensitivity to the environment and related issues	1	2	3
b) Knowledge and understanding of the environment and the impact of people on it	1	2	3
c) Attitudes and values that reflect feelings of concern for the environment	1	2	3
d) Skills involved in identifying, investigating and problem-solving associated with environmental issues	1	2	3
e) A sense of responsibility though participation and action as individuals or members of groups, whānau or iwi in addressing environmental issues.	1	2	3

E) EfS and education directions

27. Please rate your dis/agreement with the following items about the relationship between EfS and the recent New Zealand Curriculum (2008)

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a) The NZ curriculum gives a strong mandate for EfS	1	2	3	4	5
b) EfS provides a means to meet the intentions of the new NZ curriculum	1	2	3	4	5
c) EfS supports students to develop the Key Competencies	1	2	3	4	5
d) EfS is relevant to the Essence Statements and Achievement Objectives of the Learning Areas I teach	1	2	3	4	5
e) EfS prepares students to contribute to NZ's social and economic development	1	2	3	4	5
f) EfS encourages effective teaching (e.g. reflective practice, teacher inquiry)	1	2	3	4	5
g) EfS is vital for today's society and future generations	1	2	3	4	5
h) MOE needs to give stronger mandate for EfS	1	2	3	4	5

28. Please rate your dis/agreement with the following items about Māori learners' experiences with EfS, in relation to *Ka Hikitia* outcomes.

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
EfS at this school helps Māori learners to...					
a) Excel educationally (e.g. achieve their learning goals)	1	2	3	4	5
b) Realise their cultural distinctiveness and potential as Māori	1	2	3	4	5

c) Participate and contribute in ways important to their communities	1	2	3	4	5
d) Bring their own cultural knowledge to EfS	1	2	3	4	5
e) Extend their cultural knowledge through EfS	1	2	3	4	5
f) Negotiate relationships between Māori knowledge and other knowledge	1	2	3	4	5
g) Use te reo Māori	1	2	3	4	5

F) Supports and barriers to EfS development

29. Please rate how well each of the following support EfS development in your school:

	Very good	Good	Poor	Very Poor
a) Leadership support for EfS (e.g. from principal and senior managers)	1	2	3	4
b) Teachers and other staff's support for EfS	1	2	3	4
c) Parental support for EfS	1	2	3	4
d) Wider community (including local groups or organisations) support for EfS	1	2	3	4
e) Teacher retention (e.g. EfS-inspired teachers staying at the school)	1	2	3	4
f) Funding available for EfS work	1	2	3	4
g) Time available for EfS work	1	2	3	4
h) Access to EfS information and/or resource materials	1	2	3	4
i) Access to professional development	1	2	3	4
j) Access to relevant community partners	1	2	3	4
k) Government policy	1	2	3	4

30. What barriers (if any) have prevented your school from further developing EfS?

31. What more could School Support Services advisors do to help you move EfS forward?
How could the service improve?

32. What else, outside the control of SSS, could be done to support EfS? And/or in what other ways would you like to receive EfS professional development?

33. Is there anything else you want to say that might help us to evaluate EfS professional development and EfS outcomes in schools?



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EfS ADVISORS SURVEY

Dear EfS Adviser,

I would like to invite you to contribute to an evaluation of School Support Service Advisory in Education for Sustainability. This evaluation has been requested by the Ministry of Education as part of an overall evaluation of the EnviroSchools programme, School Support Service Advisory in EfS and Mātauranga Taiao. The overall aims are to understand the specific nature of the three EfS initiatives (their goals and objectives, and background), to assess and enhance the effectiveness of these initiatives, and to feed into the ongoing development of Education for Sustainability in New Zealand schools and kura.

It is expected that this questionnaire will take no longer than 30 minutes to complete. If you would like to participate, I would be grateful if the completed questionnaire could be returned by post or fax to me. Return of your completed questionnaire will be taken as consent to use the information you provide. This will be treated confidentially and any data you provide will be reported anonymously. You are free to decline to be involved.

Data collected from you may be used in writing reports, publications or in presentations. I will not use your name in any publications or presentations. I am required to gain permission from the Ministry of Education for any publication concerning this evaluation. I will make sure that I store all the information I gather from you securely.

Findings from this study will be made available to the national co-ordinators of NEfS, to be shared with the team.

Should you have any questions regarding this study, please contact me in the first instance. You can contact me at josie.roberts@nzcer.org.nz or 04 802 1431. For any unresolved issues, please contact Dr Chris Eames, Centre for Science and Technology Research, University of Waikato, Ph 07 838 4357, email c.eames@waikato.ac.nz.

Thanks for your help.

Yours sincerely,

Josie Roberts

If you agree, please complete the survey by ticking bubbles, circling numbers, and writing in the boxes provided.

Please return it by Wednesday 14 November to Josie Roberts by fax (04 3847933) or in the enclosed prepaid envelope (NZCER, PO Box 3237, Wellington).

A) Your position

34. What school support service (SSS) do you work in?

- ^a Auckland
 ^b Waikato
 ^c Massey
 ^d Victoria
 ^e Christchurch
 ^f Dunedin

35. (a) Which of the following best describes the hours you work in your role?

- ¹ Part-time
 ² Full-time

(b) If part-time, about how many hours per week are you paid to be an SSS EfS adviser?

36. Which of the following best describes your EfS adviser employment situation?

- ^a Permanent
 ^b Fixed-term
 ^c Contractor

37. How many schools of each type have you worked with during the past two years (2006–2007) as an SSS EfS adviser? [your best guess is fine, but please check the answers of a)–f) add to g)]

Type of school	Number of schools
a) Primary (up to Y6 or Y8)	
b) Intermediate	
c) Composite school (Area or Y1–13)	
d) Secondary school (Y8 or Y10 plus)	
e) Kura Kaupapa Māori	
f) Other, please describe _____	
g) TOTAL	

38. How many of each of these schools have you worked with?

[your best guess is fine, but please check the answers of a)–f) add to g)]

Type of school	Number of schools
a) Very small (under 100)	
b) Small (100–249)	
c) Medium (250–499)	
d) Large (500–999)	
e) Very large (over 1000)	
f) TOTAL	

39. Are you in a NEFS national working group?

¹ Yes

² No

(a) If yes, please indicate which working group(s) you are part of

^a TLRI Research Team with Chris Eames

^b Te Ropu Ako

^c Resource dissemination (Beam Team)

^d Data Gathering Team

^e Assessment Team

^f Other, please describe _____

B) Your background

40. In what year did you become an EfS SSS adviser?

2007

2006

2005

2004

2003

2002

Other, please give year: _____

41. What was your job (or otherwise) immediately before that?

42. Which of the following education roles have you held in the past? [Please tick all that apply]

^{a)} Primary teacher

^{b)} Secondary teacher

^{c)} Middle management in primary or secondary

^{d)} DP or AP in primary or secondary

^{e)} School Adviser outside of EfS

^{f)} Educational consultant outside of SSS

^{g)} Pre-service teacher educator

^{h)} Other education role, please describe: _____

43. Which of these are part of your background?

- a) Personal environmental involvement
- b) Membership of environmental group(s)
- c) Youth/community work
- d) Tertiary education in an environmental/sustainability area
- e) If so, please describe _____
- f) Other environmental background (please describe) _____

44. What is your highest qualification? [Please tick one only]

- a) Post graduate degree or diploma (please describe) _____
- b) Bachelor degree (please describe) _____
- c) Undergraduate diploma/certificate (please describe) _____
- d) Other (please describe) _____

C) Conceptualising your work

45. What is your understanding of the main purpose of the work of EfS regional advisors?**46. What term do you prefer to describe your area of work? [Please tick one only]**

- ^a Environmental Education ^b Education for Sustainability
- ^c Education for Sustainable Development ^d Education for Environmental Sustainability
- ^e Other, please specify: _____

47. Why did you select the answer you provided for the above question?**48. There are various “elements” within the concept of sustainability. On the table below, please rate:**

- (a) How well do you think you understand the implications that each has for how schools, teaching, and learning might ideally operate

- (b) How well do you think schools you work with understand the implications that each has for how schools, teaching, and learning might ideally operate (all schools are different, but please make an overall judgement)

	a) YOUR understanding				b) SCHOOLS' understanding			
	Very well	Well	Not very well	Not sure	Very well	Well	Not very well	Not sure
a) Environmental aspects of sustainability	1	2	3	4	1	2	3	4
b) Social aspects of sustainability	1	2	3	4	1	2	3	4
c) Cultural aspects of sustainability	1	2	3	4	1	2	3	4
d) Economic aspects of sustainability	1	2	3	4	1	2	3	4
e) Political aspects of sustainability	1	2	3	4	1	2	3	4

49. Would you like to make any comments about your response to the above question?

50. How well do you feel that the following are understood by:

(a) Yourself

(b) The schools you work with (all schools are different, but please make an overall judgement)

	a) YOUR understanding				b) SCHOOLS' understanding			
	Very well	Well	Not very well	Not sure	Very well	Well	Not very well	Not sure
a) The aims of EfS/EE in schools generally	1	2	3	4	1	2	3	4
b) The Environmental Education Guidelines	1	2	3	4	1	2	3	4
c) The purpose of the SSS EfS programme at a regional level (working with schools)	1	2	3	4	1	2	3	4
d) The purpose of the SSS EfS programme at a national level (working on national tasks)	1	2	3	4	1	2	3	4
e) The purpose of EnviroSchools	1	2	3	4	1	2	3	4
f) The purpose of Mātauranga Taiao	1	2	3	4	1	2	3	4

D) Supporting your work

51. Please rate the following resources in terms of:

(a) How frequently you use each to support your work

(b) How useful you find each to share with schools

	a) How often for you?			b) How useful for schools?			
	Regularly	Occasionally	Never	Very useful	Useful	Not useful	Not sure
a) Environmental Education Guidelines	1	2	3	1	2	3	4
b) EnviroSchools Kit	1	2	3	1	2	3	4
c) MOE key messages on Education for Sustainability	1	2	3	1	2	3	4
d) EfS area of the TKI website	1	2	3	1	2	3	4
e) Web-based resources from other websites	1	2	3	1	2	3	4
f) Resources from non-web sources e.g. CDs, books	1	2	3	1	2	3	4
g) Your own self-developed resources	1	2	3	1	2	3	4
h) People in the EfS community	1	2	3	1	2	3	4
i) NEFS Team Strategy 2006–2008	1	2	3	1	2	3	4

52. Please describe any other resources that you find particularly useful for your EfS adviser work?

53. What professional development (or similar activities) have you received to help you in your role?
(Please tick if you have done it, and if so indicate how useful you found it overall)

	YES, took part	Very useful	Useful	Slightly useful	Not useful
a) EnviroSchools Level One training	<input type="radio"/>	1	2	3	4
b) EnviroSchools Level Two training	<input type="radio"/>	1	2	3	4
c) October 2007 NEFS National Hui	<input type="radio"/>	1	2	3	4
d) Previous NEFS National Hui	<input type="radio"/>	1	3	3	4
e) Any NEFS working groups you are part of	<input type="radio"/>	1	2	3	4
f) EfS New Advisor training (began 2007)	<input type="radio"/>	1	2	3	4

54. Please describe any other relevant professional development that you have found useful for your work? [Please also indicate the year in which you took part]

Year	Professional Development

55. What other professional development would you like?

E) Schools you work with

This next section asks you to think about all the schools you have worked with over the past two years, separated by primary and secondary level. If you only work in primary OR secondary, just complete the relevant part of the tables below.

56. Thinking about primary and secondary separately, in what proportion of schools do you work with the following people?

	a) Primary schools				b) Secondary schools			
	All schools	More than half	Half or less	No schools	All schools	More than half	Half or less	No schools
a) Students	1	2	3	4	1	2	3	4
b) A "lead" EfS teacher in the school	1	2	3	4	1	2	3	4
c) <i>Some</i> teachers	1	2	3	4	1	2	3	4
d) <i>All</i> teachers	1	2	3	4	1	2	3	4
e) School management, e.g. principal	1	2	3	4	1	2	3	4
g) Community partner(s), e.g. local environmental group, regional council, or business	1	2	3	4	1	2	3	4

h) Other, *please describe:*

57. Thinking of your work with teachers, in what proportion of schools do you do the following?

	a) Primary schools				b) Secondary schools			
	All schools	More than half	Half or less	No schools	All schools	More than half	Half or less	No schools
a) Share resources about EfS	1	2	3	4	1	2	3	4
b) Provide “environmental” content knowledge	1	2	3	4	1	2	3	4
c) Provide “wider” sustainability content knowledge	1	2	3	4	1	2	3	4
d) Provide pedagogical ideas for teaching processes	1	2	3	4	1	2	3	4
e) Teach practical environmental skills to teachers	1	2	3	4	1	2	3	4
f) Provide advice to help design a course/class/activity	1	2	3	4	1	2	3	4
g) Provide advice about integrating the curriculum	1	2	3	4	1	2	3	4
h) Work one-on-one with teachers	1	2	3	4	1	2	3	4
i) Support teacher learning communities <i>within</i> schools	1	2	3	4	1	2	3	4
j) Support teacher learning communities <i>between</i> different schools	1	2	3	4	1	2	3	4
k) Provide suggestions for EfS-relevant assessment	1	2	3	4	1	2	3	4
l) Support the collection of EfS-relevant data	1	2	3	4	1	2	3	4
m) Support the analysis of EfS-relevant data	1	2	3	4	1	2	3	4

58. To what extent do you think that your work has impacted on the following for teachers:

	a) Primary schools				b) Secondary schools			
	Strong positive impact	Some positive impact	No impact	Negative impact	Strong positive impact	Some positive impact	No impact	Negative impact
a) Change in teacher beliefs about students’ capabilities	1	2	3	4	1	2	3	4
b) Change in teacher beliefs about environment/sustainability	1	2	3	4	1	2	3	4
c) Change towards co-operative and action inquiry learning	1	2	3	4	1	2	3	4
d) Change in teacher–student decision-making relationships	1	2	3	4	1	2	3	4
e) Change towards critical reflective teaching	1	2	3	4	1	2	3	4
f) Change in teacher planning processes	1	2	3	4	1	2	3	4
g) Change towards “21 st century” teaching/learning ideas	1	2	3	4	1	2	3	4
h) Change towards integrated curriculum	1	2	3	4	1	2	3	4

59. To what extent do you think that your work has impacted on the following wider areas:

	<i>a) Primary schools</i>				<i>b) Secondary schools</i>			
	Strong positive impact	Some positive impact	No impact	Negative impact	Strong positive impact	Some positive impact	No impact	Negative impact
a) Change in incorporation of EE/EfS into the curriculum change	1	2	3	4	1	2	3	4
b) Change in assessment practices	1	2	3	4	1	2	3	4
c) Change in student achievement	1	2	3	4	1	2	3	4
d) Change in data collection practices	1	2	3	4	1	2	3	4
e) Change in school structure, e.g. timetables	1	2	3	4	1	2	3	4
f) Change in school physical environment	1	2	3	4	1	2	3	4
g) Change in sustainable organisational management	1	2	3	4	1	2	3	4
h) Change in leadership support for EE/EfS	1	2	3	4	1	2	3	4
i) Change in school partnerships with external groups	1	2	3	4	1	2	3	4
j) Change in student involvement in actions for the environment	1	2	3	4	1	2	3	4
k) Change towards whole school approach to EE/EfS	1	2	3	4	1	2	3	4

60. Thinking about how your work with teachers can influence student learning, to what extent do you think your work has impacted on the following EE/EfS aims for students?

	<i>a) Primary schools</i>				<i>b) Secondary schools</i>			
	Strong positive impact	Some positive impact	No impact	Negative impact	Strong positive impact	Some positive impact	No impact	Negative impact
a) Awareness and sensitivity to the environment and related issues	1	2	3	4	1	2	3	4
b) Knowledge and understanding of the environment and the impact of people on it	1	2	3	4	1	2	3	4
c) Attitudes and values that reflect feelings of concern for the environment	1	2	3	4	1	2	3	4
d) Skills involved in identifying, investigating and problem-solving associated with environmental issues	1	2	3	4	1	2	3	4
e) A sense of responsibility though participation and action as individuals or members of groups, whānau or iwi in addressing environmental issues.	1	2	3	4	1	2	3	4

61. What other positive impacts has your work as an EfS adviser had? (e.g. for students, teachers, schools, communities etc)

F) Data collection and reporting

62. Please think about your ratings in the above section about the impact of your work. In the box below please describe the following:

(a) What data (if any) have you collected to know you are making a difference?

(b) What data (if any) have schools you work with collected to know that they are making a difference with EfS?

(c) What kind of evidence do you supply in milestone reports?

(d) How useful have you found the following informing EfS work?

	YES, used	Very useful	Useful	Slightly useful	Not useful
a) Data you personally collect	<input type="radio"/>	1	2	3	4
b) Data schools you work with collect	<input type="radio"/>	1	2	3	4
c) Regional milestone reports	<input type="radio"/>	1	2	3	4
d) Other reporting you do at a regional level	<input type="radio"/>	1	2	3	4
e) Reporting you do at a national level	<input type="radio"/>	1	2	3	4

G) Working relationships beyond schools

63. Please rate how good a working relationship you have with the following:

	Excellent relationship	Good relationship	Poor relationship	No relationship yet
a) Other EfS advisors in your region	1	2	3	4
b) Other EfS advisors outside of your region	1	2	3	4
c) The EfS national co-ordinators	1	2	3	4
d) Local SSS advisors in other curriculum areas	1	2	3	4
e) Your region's SSS management	1	2	3	4
f) Enviroschools' facilitators	1	2	3	4
g) Mātauranga Taiao facilitators	1	2	3	4
h) NZ Association for Environmental Education (NZAEE)	1	2	3	4
i) NZ Decade for Education for Sustainable Development	1	2	3	4
j) EfS-promoting NGOs, such as WWF and Sir Peter Blake Foundation	1	2	3	4
k) Local businesses	1	2	3	4
l) Established/complementary environmental programmes	1	2	3	4
m) Established/complementary programmes in schools (e.g. healthy eating, peer support)	1	2	3	4

64. What other groups does your region's EfS team have good working relationships with?

H) EfS SSS objectives

65. Below is a list of NEfS team aims as outlined in your 2006–2008 Strategy. Please rate each on how well you think they have been achieved so far.

The NEfS team aims...	Achieved well	Progress being made	Slow/initial progress being made	No progress being made	Can't comment
a) To promote EfS as an imperative for New Zealand and global society	1	2	3	4	5
b) To have a nationally co-ordinated programme which collaborates with key agencies, regionally, nationally and internationally, working for a sustainable future	1	2	3	4	5
c) To use data and evidence to advocate for higher status for Education for a Sustainable Future (EfS) in New Zealand schools and kura by having a stronger mandate in the curriculum framework	1	2	3	4	5
d) To ensure that EfS includes social, political, cultural, economic and bio-physical aspects	1	2	3	4	5
e) To ensure EfS promotes the teaching and learning strategies that reflect the key competencies of the curriculum framework	1	2	3	4	5
f) To work in partnership with facilitators of the EnviroSchools Programme to provide a holistic vision and support structure for schools and kura	1	2	3	4	5
g) To use evidence of student achievement to advocate for recognition and support for innovative teachers modelling effective practice in EfS	1	2	3	4	5
h) To have more acknowledgement/recognition/support from MOE/SSS for the special characteristics of the in-depth work of the regional EfS co-ordinators (RC's) promoting quality teaching and learning in schools and kura	1	2	3	4	5
i) To have cross-curricular standards in EfS registered on the NZQA framework	1	2	3	4	5
j) To have more support for Māori pedagogy and understanding of EfS in each region to support kura and mainstream education	1	2	3	4	5
k) To build the EfS team's own content and pedagogical knowledge	1	2	3	4	5
l) To link student pathways from preschool education to tertiary education	1	2	3	4	5

I) Final overview

66. What is the best thing about your work as an EfS adviser?

67. What are some of the barriers that are hindering the development of EfS in schools?

68. What are some of the barriers that you face in your work in the SSS EfS team?

69. What is your hope for the future of EfS for schools in your region?

70. Are there any other comments you wish to make?

Thank you for your participation



Please return this survey in the freepost envelope provided to
Josie Roberts, NZCER, PO Box 3237, Wellington
Or fax to 04 384 7933.

Appendix B: Advisors' ratings of their effectiveness

EfS advisors' impressions

Overall patterns suggest that the EfS advisors perceive that they have the greatest impact on teaching and learning, from both a pedagogy and content perspective. Because the numbers are small, quantitative data need to be interpreted cautiously. Also, since eight of the 20 respondents only joined their EfS team in 2007, they may not have had sufficient time to support change.⁶³ More than 70 percent advisors believed that their work had achieved positive impact on the following at primary and secondary level (including "strong positive impact"):

- change in teacher beliefs about students' capabilities
- change in teacher beliefs about environment/sustainability
- change towards co-operative and action inquiry learning
- change in teacher–student decision-making relationships
- change towards critical reflective teaching
- change in teacher planning processes
- change towards "21st century" teaching/learning ideas
- change in incorporation of Environmental Education/EfS into the curriculum change
- change in student involvement in actions for the environment.

Following are the aspects that they thought they were the least likely to impact on. At least 40 percent of both primary and secondary advisors believed that they had had "no impact" in primary and secondary schools on:

- change in data collection processes
- change in assessment practices
- change in school structure (e.g., timetables).

Aspects of EfS impact that were generally positive but less clearcut between primary and secondary were:

- change towards integrated curriculum
- change in student achievement
- change in school physical environment
- change in sustainable organisational management
- change in leadership support for Environmental Education/EfS
- change in school partnerships with external groups

⁶³ Three advisors had joined in 2005 or 2006, and eight had joined between 2002 and 2004.

- change towards whole-school approach to Environmental Education/EfS.

At least 75 percent of the advisors believed that their work had had a positive impact on achieving each of the five Environmental Education aims related to students, as outlined in the *Guidelines for Environmental Education* (Ministry of Education, 1999). Other outcomes for schools, teachers and students (and others) mentioned in EfS adviser interviews and surveys included, but were not restricted to, the following:

- Learning contexts have become relevant, authentic and of consequence to students and teachers.
- Students are more actively engaged in their learning and the school, and schools have recognised the importance of “student voice”.
- Students have increased access to new experiences and leadership opportunities, which has improved their confidence.
- There is a greater sense of identity or sense of place for students.
- There is more awareness of “local global issues”.
- Teachers have realised that change in pedagogy is not as difficult as they had originally expected.
- The whole-school approach has brought staff together and increased professional learning conversations.
- Lead schools have been used as models for other teachers and schools.
- There have been some flow-on effects as students move from primary school through to the local secondary school.
- There has been a transference of sustainability design principles from home to school environments; for example, waste recycling, questioning etc., including family and/or community sustainability projects have been inspired by EfS at the school.
- There is strong networking with community partnerships (such as local councils etc.).
- Schools have built home–school–community relationships and partnerships.
- School staff have embraced the opportunity to learn in the environment with community members and enjoy building learning relationships.

Part Four:

Report on Mātauranga Taiao

Garrick Cooper

Preliminary Note

Part Four of this report focuses on the Mātauranga Taiao initiative. Part One provides an overview of the main findings for each initiative and examines what each contributes to EfS in New Zealand. The other evaluation findings for each initiative appear in Parts Two and Three.

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1. Introduction

The Evaluation of Education for Sustainability (EfS), funded by the Ministry of Education, involves three initiatives: Mātauranga Taiao, the national EfS team within School Support Services and the EnviroSchools programme. This report focuses on the first of these initiatives— Mātauranga Taiao.

Mātauranga Taiao began in 2007, and developed from a vision for targeted professional development in EfS in Māori-medium education. A national co-ordinator and two regional co-ordinators provide professional development for kaiako and Resource Teachers of Māori to enable them to foster EfS in Māori immersion programmes kura kaupapa Māori, kura-a-iwi, kura motuhake and immersion units and bilingual units within English-medium schools.

As Mātauranga Taiao development was at a much earlier stage in its development in relation to the other two EfS initiatives, I set out to explore the background, philosophical underpinnings, aims, processes and early outcomes of the programme, by answering a series of evaluation questions adapted from the overall evaluation. This report provides evaluative evidence, analysis and informed commentary, to:

- inform the ongoing work of Mātauranga Taiao
- provide a detailed backdrop to the overview evaluation report that looks across all three EfS initiatives (Eames, Roberts, Cooper & Hipkins, in press).

2. Methodology

The Mātauranga Taiao component of the overall evaluation was designed as an exploratory study, aiming to:

- explore perceived needs and visions for EfS in Māori-medium education
- contextualise EfS in kura, through discussions around worldviews and knowledge systems
- examine Māori philosophical concepts that inform the development of the programme
- explore the types of student outcomes programme staff are hoping to achieve.

While the exploratory study was informed by the evaluation questions and analysis framework that the Ministry of Education and our full evaluation team developed for the overall evaluation of the three EfS initiatives, the unique nature of Mātauranga Taiao meant that I took a more formative approach. The overall evaluation questions, and how they were adapted to be most useful for addressing the specifics of the Mātauranga Taiao initiative, are presented below.

Overall evaluation questions	Mātauranga Taiao evaluation questions
What are the key messages, goals and intended outcomes of school-based EfS and how does each initiative align with these?	Why and how did Mātauranga Taiao initially come into being? What are the philosophical underpinnings that guide Mātauranga Taiao? How does Mātauranga Taiao relate to overarching EfS goals and other EfS providers?
How effective are the three initiatives in “operationalising” EfS key messages and achieving EfS goals in schools?	How did the Mātauranga Taiao professional development programme operate during its first two years? What does it aim to achieve, and what outcomes were achieved during this period?
What are the future directions for school-based Education for Sustainability in relation to current and potential goals?	What issues and opportunities emerge as the programme develops that might provide guidance for the future?

The evaluation was conducted in two phases.

Phase One of the evaluation

The first phase of the evaluation involved interviewing Mātauranga Taiao programme staff. The main purpose of these interviews was to investigate the lead up to the development of the Mātauranga Taiao programme, the philosophical underpinnings of the programme and the types of outcomes the programme staff hoped to achieve. I interviewed the national co-ordinator and two regional co-ordinators in late 2007.

In addition to these interviews, I read various relevant documents including: the Mātauranga Taiao contract to provide professional development services between the Ministry of Education and Victoria University of Wellington; Mātauranga Taiao milestone reports; programme planning; and emails between members of the Mātauranga Taiao team and those from the wider EfS teams.

Phase Two of the evaluation

In the second phase of the evaluation I interviewed the national co-ordinator, two Mātauranga Taiao students, and the principal of the kura in which one of the Mātauranga Taiao students worked. One of the Mātauranga Taiao students was

a principal. I had planned to interview the regional co-ordinators and a third student. However, one regional co-ordinator resigned during 2008 due to illness, and by the time we were ready to interview the second regional co-ordinator, she had resigned to take up a position overseas. One of the Mātauranga Taiao students interviewed worked in a well-established kura kaupapa Māori located in a major city. The second Mātauranga Taiao student was a teachingumuaki of a small area school (around 30 students).

I also reviewed secondary data including: student presentations of work they did in their respective kura; collated student evaluations of Mātauranga Taiao programme; co-ordinator documentation and milestone reports to the Ministry of Education; and other documents, such as memorandums and emails, that the co-ordinators felt would be helpful in this evaluation.

Report structure

Throughout this report I use the term “students” to refer to the students of the Mātauranga Taiao professional development programme. Most of the students involved in the Mātauranga Taiao programme were either currently employed as teachers in Māori-medium schools¹ (or units within a school) or were advisers to Māori-medium schools. I use the term “young kura students” for young students in kura kaupapa Māori. I use the term “environmental education” to describe earlier work and thinking in this area, and “Education for Sustainability” (EfS) for the present day.

The report is structured by the Mātauranga Taiao evaluation questions. It begins by describing the development of the Mātauranga Taiao programme and its philosophy in Chapter 3 and 4. Chapter 5 examines the operational processes of the Mātauranga Taiao professional development programme, and the following chapter outlines the outcomes that have emerged to date. The alignment between Mātauranga Taiao and the overall EfS goals and the work of other EfS providers are considered in Chapter 7, as are some of the challenges and possibilities for future work in this area in the final chapter.

¹ Included here are kaiako of kura kaupapa Māori, kura-a-iwi, kura motuhake and immersion units and bilingual units within an English-medium school.

3. Development of the Mātauranga Taiao programme: Why and how did Mātauranga Taiao initially come into being?

The idea for the Mātauranga Taiao emerged from a long-time interest in environmental education by a number of Māori educators. One co-ordinator² became involved in 1995 as part of the group involved in establishing guidelines for environmental education in schools, and the other two co-ordinators became involved in 2002–3.

The document, *Guidelines for Environmental Education in New Zealand Schools*, published by the Ministry of Education in 1999, was the culmination of various initiatives and meetings, dating back to 1995. It is from this point that one of the co-ordinators first became involved in the development of environmental education at a national level. At a hui in 1995, five Māori educationists (including one of the interviewees for this evaluation) were invited to discuss environmental education. From that time this particular co-ordinator was involved in the various discussions and her brief was to provide a Māori perspective into the development of the guidelines.

The other two co-ordinators became involved in 2002 and 2003 specifically through their involvement in a hui organised by Barry Law of the University of Canterbury. This hui, in April 2003 at Takahanga Marae in Kaikoura, brought together a group of people who were involved in Māori-medium education, either as kaiako, advisers or professional development providers, and who had an interest in environmental education.

It appears that the main objective of this hui was to start a “conversation” amongst Māori-medium education people about what environmental education means in a Māori context. One of the tasks of the hui was to come up with a resource that could be used in Māori-medium education.

There was, at this stage at least, no formal Māori strand of environmental education being talked about or delivered. Up to this point Māori involvement in environmental education had been about providing a Māori perspective which could be “added” into the “mainstream” environmental education programme. From my reading of the documentation and interview data, it appears that the Māori “voice” was subsumed into the wider environmental education agenda. This raised further questions about what effect the inclusion of Māori concepts and knowledge into an essentially Western scientific discourse had on these aspects of Māori knowledge. Law and Baker (1997, p. 231) have also noted that the consultation process undertaken by those who were developing the initial draft of the environmental education guidelines was one that was “not seen to be owned by ... Māori or undertaken in a way that they saw as appropriate” (p. 231).

For the point of view of some of the people I interviewed, and from my reading of some of the documentation, this became problematic. There seemed to be at least two main concerns. The first was that Māori concepts were being used in superficial ways which lacked any deeper understanding about how they operate in Māori contexts. There were concerns that they were not being used properly and were being appropriated. These are understandable concerns; however they are not easily addressed. I will come back to these issues in Chapter 8 and discuss them in the context of

² In this report I refer to the Mātauranga national co-ordinator and the two regional co-ordinators simply as “co-ordinators”. The main reason for this is to maintain, as much as possible, some anonymity for the research participants. There are times, however, that I have stated the specific position of the informant.

the “cultural interface”. The second concern was that it appeared that Māori-medium education-specific-initiatives seemed to be an “after-thought” and that EfS was no different:

Interviewer: Was there some unhappiness about the level of service provided for Māori-medium [schooling] specifically or was it just a general belief right from the beginning that in fact we needed a Māori-driven, centred, type [programme]?

Co-ordinator: Well both of those. Definitely that we need a Māori-driven incentive but it’s just history repeating itself. I was a resource teacher of Māori for a year and in that time we had two or three days professional development on the Hangarau draft document, several of those support curriculum documents, the Pūtaiao one, ‘Ina Te Ora o Te Tangata’ and the reo one or something like that so over two, three days professional development on that for RTMs, and sent back into our regions to familiarise teachers with them and report back on submissions to the Ministry in a very short period of time. So you know what I mean, no release money for teachers to professionally develop them ... so they [Pākehā] get those big packages to do professional development really well and the time to do it and Māori have never ever had that ... and yet this is probably the kaupapa that should be led by Māori. (Mātauranga Taiao co-ordinator)

This raises questions about equity and how decisions are made about the types of professional support services that those working in Māori-medium education believe they need.

Despite these concerns, a number of leading Māori educators were interested in EfS and the opportunities it potentially offered Māori-medium education. The current national co-ordinator, who was at that time already providing professional support services for kaiako in Māori-medium education in the area of pūtaiao (science), was excited by the potential of environmental education in terms of its “fit” with the kaupapa of Māori-medium education:

So [the programme director] and my past managers had seen that this [environmental education] was an exciting area for Māori and we’d seen fantastic examples especially from [names of Māori-medium education facilitators] and how Māori-medium schools had taken up on this kaupapa. It’s not saying that they hadn’t been working in this kaupapa for a long time anyway, and for me personally being a Māori-medium teacher and obviously very excited in the areas of pūtaiao it was a great way of looking at issues in your community and providing really meaningful experiences for your tamariki. Also I found it hard managing your curriculum ... [so there was] a real integrated or thematic approach ... So those are elements of why we thought it was very exciting. (Mātauranga Taiao co-ordinator)

Environmental education was seen as a way of delivering or teaching aspects of pūtaiao (science) in ways that were more consistent with the more “connected” or holistic approach to knowledge in Māori-medium education, and one that was less compartmentalised than the traditional approach to teaching science in schools. The co-ordinator had previously found that the demand for pūtaiao professional support—which she was contracted to provide services for—in Māori-medium education, was not as high, and the environmental education programme was an opportunity to assist in developing quality pūtaiao programmes for kura. She also believed that the experience would be one that was more meaningful for the tamariki and their communities.

In 2006, along with her manager, she put in a proposal to the Ministry of Education to provide environmental education professional development services specifically for Māori-medium education. This proposal was accepted and a contract and Memorandum of Understanding was signed by Te Kura Māori at the University of Victoria Wellington and the Ministry of Education in 2006.

4. Philosophy of Mātauranga Taiao programme: What are the philosophical underpinnings that guide Mātauranga Taiao developments?

There are several philosophical and conceptual understandings that underpin Mātauranga Taiao which are perhaps unique to this programme. They illustrate a type of interconnectedness and interdependability between the physical environment and people (and ātua Māori) that stem from Māori epistemologies. Māori epistemologies have often been described as being holistic in the sense that they look at the whole and the relationships that constitute this whole. While I will describe the ways in which Mātauranga Taiao was described to me from interviews and documentation, I do not go into comparisons here between Māori and Western epistemologies and conceptual understandings of these programmes. However, I briefly explore this in the final chapter given that there are significant conceptual differences—stemming from the different epistemological orientations that flow on to the initiatives themselves—which frame each of the EfS initiatives and that perhaps lead to different types of actions and different reasons for actions.

Mātauranga Taiao draws explicitly and implicitly from Māori epistemologies. One of the co-ordinators referred to the knowledge that Mātauranga Taiao draws from and is informed by:

It [Mātauranga Taiao] relates to our whakapapa and taonga tuku iho, tikanga tuku iho, and so it's encompassing our knowledge and our taonga passed down by our tīpuna and all of that. So we are always looking at or exploring the past and the present and the future—what are we leaving for our tamariki, mokopuna. (Mātauranga Taiao co-ordinator)

From my reading of the activities and types of resources that have been employed to deliver the programme to date, however, Mātauranga Taiao, although drawing predominantly from Māori epistemologies, does not preclude the use of other knowledges, such as Western knowledges.

Mātauranga Taiao literally means “environmental (as in physical surrounds) knowledge” or “knowledge about the environment”. For those whom I interviewed for this evaluation the Taiao or environment was not restricted to the physical environment, nor separated from the human and social environment. This is consistent with Māori epistemologies which make explicit connections between the gods, people and the environment through the use of whakapapa or genealogical matrices (Barlow, 1991; Best, 1995; Mead, 2003). One of the co-ordinators recalled an interview she had completed with her kuia, which for her illustrates this point:

... I was doing my own study in an interview with my nan and when she talked, all of her examples were about māra kai and practices within the physical environment and then a comment made by my aunty who sat in on the interview, ‘You know what it is, how your grandmother sustains things Māori, it's about family for her and how she is, high expectation and that's right from how you keep your home, how you look for the rest of the community, how you behave in the rest of the community.’ I said that's sustainability and that's what your grandmother is ... It is not just about our physical environment, for my grandmother [sustainability is about] the whanaunga, obviously for a lot of Māori families, the whanaunga, but whānau is the most important thing. But whānau for her is definitely about how you look and how you behave ... that's her way of keeping order ... (Mātauranga Taiao co-ordinator)

Here for this kuia, sustainability is about sustainable relationships in whānau as well as an interrelated sustainability between people and the physical environment.

The co-ordinators talked at length about the interconnectedness and relationships between the people and the environment. Whilst acknowledging that this notion of interconnectedness is not exclusive to Māori epistemologies, the co-ordinators used whakataukī or proverbs to articulate the relationships and interconnectedness. For example, “Ko koe ko au, ko au ko koe” (“You are me and I am you”) and “Ka mate te Taiao ka mate te tangata, ka ora te Taiao ka ora te tangata” (“If the health of the environment is compromised then so are people, if the environment is healthy then so are people”) were mentioned by one of the co-ordinators to describe her philosophical approach to Mātauranga Taiao. I am not sure of the origins of these particular whakataukī. I suspect that they were composed for environmental education specifically. These whakataukī, however, are very similar to a well-known whakataukī, “He whenua, he wahine, ngaro ai te tangata”, sometimes translated as “It is because of land and women that men perish”. Another translation of this whakataukī reads, “Without land and women, men would perish”. Suffice to say either translation talks to the interdependence of land (or the physical environment), women and men.

There is another important underlying theme in these relationships between people and the environment; that is, to “know” the environment through narratives that talk to the historical relationships. In practice, co-ordinators reported that they emphasise the learning of historical stories and narratives like pēpeha, pakiwaitara and pūrākau as integral to Mātauranga Taiao. The retention and regeneration of these narratives in te reo Māori is seen as important in the wellbeing in the physical environment; in other words, the wellbeing of the environment is not independent from these historical narratives and traditions. This idea is connected to an argument put forward by a prominent scholar in linguistic rights, Tove Skutnabb-Kangas (2000), who, in a large and comprehensive piece of research, argues that where there is a decrease in linguistic diversity, so too the biodiversity is compromised. Skutnabb-Kangas suggests that the relationship between linguistic diversity and biodiversity may “not only be correlational, but in fact may be causal” (2000, p. ix).

Another philosophical position articulated by all of the interviewees was that localised knowledge is important—and vital for its sustainability as a programme—in the rollout of the Mātauranga Taiao programme:

... so education for sustainability is quite different to that, I mean you still [have] global perspectives and make global connections and national and so forth, *but local is the focus* [of Mātauranga Taiao] ...
(Mātauranga Taiao co-ordinator)

This type of philosophical approach encourages using the resources that are already available in the different communities and thereby continuing to acknowledge and validate localised knowledge and experiences. Whilst the programme draws upon Māori views that are perhaps generic across all of Māoridom, it also acknowledges that there are already *puna* (literally “wellsprings” or sources) of knowledge in each of their communities that should be accessed. Furthermore you could argue that localised knowledge will be more appropriate and effective because it has been developed over many, many generations, and is sensitive and appropriate to the different contexts (Battiste & Youngblood Henderson, 2000). One of the co-ordinators also said that a similar point was made by a keynote speaker at the New Zealand Association of Environmental Educators conference in Dunedin in 2008.

The focus on the local also demonstrates an underlying belief that knowledge, and what counts as knowledge at the local level, is most important in terms of any programme that is developed. In a sense this is a recognition that any programme on Mātauranga Taiao needs to actually be about “taiao” or that those who are involved live in, know and are intimate with the local, and not the taiao in other parts of the world that they would have little personal experience and a “lived” knowledge of. Here I make a distinction between knowledge that it is a “lived” and “experienced” knowledge and knowledge that is a cognitive knowledge of something.

In summary, Mātauranga Taiao draws directly from Māori epistemology and views the environment in a holistic way, taking account of the environment, the people and the relationships both between the environment and people as well as between people. As such it values a view of sustainability that focuses on the interconnections between people and the environment—past, current and future. Finally, while acknowledging the importance of the global context, Mātauranga Taiao places a particular value on localised knowledge; that is, knowledge held in the community and learnt by being there.

5. Mātauranga Taiao professional development programme: How did the Mātauranga Taiao professional development programme operate and develop during its first two years?

There were about 25 professional development students, either kaiako or Resource Teachers of Māori (RTMs), who were working in or with Level 1 or Level 2 te reo Māori immersion programmes. During, and at the completion of the professional development, they are contracted to implement Mātauranga Taiao into the educational programmes at the kura or schools that they work in or with.

The Mātauranga Taiao professional development programme was divided into two distinct but interconnected activities conducted over a two-year period. Mātauranga Taiao students attended a series of week-long noho throughout the course of the two years and these were to be followed up by onsite support visits by the national and regional co-ordinators.

National noho

The noho comprised a mix of guest speakers, workshops and site visits. The co-ordinators ran a series of workshops during the course of the noho and while some of the activities were about providing and constructing environmental/sustainability knowledge there was a big emphasis on developing pedagogical knowledge. The workshops were designed to encourage students to facilitate learning by drawing upon the puna mātauranga (sources of knowledge) in each of their communities. The workshops often comprised activities where students constructed teaching resources that they could use in the classroom. Guest speakers included people who had expertise in Māori knowledge as well as those with expertise in Western science.

Three noho were held in 2007. Two were held in 2008, one in Kapiti and one in Rotorua. The noho were held in hotels and sometimes in marae.

Regional support visits

The second activity that made up the professional development programme was the follow-up or support visits at the regional level. Mātauranga Taiao employed one national co-ordinator and two regional co-ordinators (one based in the North Island and one in the South Island). One of the tasks of the regional co-ordinators was to do follow-up visits to monitor and assist Mātauranga Taiao students in the implementation of the programme into the kura/school planning and curriculum.

The Mātauranga Taiao programme lost one of the regional co-ordinators due to illness part way through 2008. Unfortunately this was the regional co-ordinator in the North Island where the bulk of the Mātauranga Taiao students were located and therefore the level of support provided for the Mātauranga Taiao students was limited. The national co-ordinator made a few visits to follow up Mātauranga Taiao students in this region. However, the support provided was less than initially planned given that the co-ordinator was based in Wellington and so some distance from the

students. The national co-ordinator acknowledged this part of the programme was not implemented as intended as they were unable to get someone who was suitably qualified to fulfil this role.

Extending beyond the original students

One of the deliverables in the Mātauranga Taiao contract was to implement the Mātauranga Taiao professional development programme in a minimum of 40 kura and schools over the two-year implementation period. In order to achieve this, participants of the Mātauranga Taiao professional development were expected to work with their own kura or school in the first year and a second kura or school—perhaps nearby to the kura they worked in—in the second year of the Mātauranga Taiao programme. The participants essentially were to become Mātauranga Taiao advisers at their schools and in the second year of the programme in at least one other kura or school:

... our facilitators who are kaiako and RTMs out in our schools understand that there's a high expectation of them in sustaining this kaupapa and so in their first year they were expected to work with a teacher in their school and begin to look at working with another teacher just [to spread the] philosophy and because of the minimum amount of resources that we have. So there was a high expectation of them straight away and we've seen the ... fruits of that, in our beginning of the second year. Already two clusters, which total about 10 teachers, have begun their own wānanga, which pretty much they're facilitating wānanga with other teachers in their rohe. So that's the philosophy around the delivery of the professional development ...—building capacity with the limited resources that we have. (Mātauranga Taiao co-ordinator)

While there was some evidence of students working beyond their own kura, through cluster meetings and wider wānanga (discussed in the next chapter), progress with this aspect of the programme was minimal. Given the time frame of just two years and the complexity of the tasks facing the students this is, perhaps, to be expected. The demand on the students is one of the challenges discussed in the final chapter.

Students' views of the Mātauranga Taiao professional development programme process

The students interviewed were generally very positive about the Mātauranga Taiao programme despite some of the difficulties with the follow-up support visits in the second year of the study. In the student evaluations³ about the Mātauranga Taiao programme, students cited a wide range of things that they enjoyed about the programme and that they considered to be valuable to their learning and their work. Students particularly enjoyed the site visits, the speakers, working collaboratively and the development of their critical thinking skills. The enquiry learning, experiential and co-operative learning activities were some of the most popular and useful activities students were engaged in during the noho.

We look more closely at the outcomes that were achieved from these activities next, where I also describe the processes in more depth.

³ This is based on the collated responses of the Mātauranga Taiao students in an evaluation of the programme at the conclusion of 2008.

6. Mātauranga Taiao outcomes: What do they aim to achieve, and what outcomes are perceived for students, kura and communities?

The work of the Mātauranga Taiao team was framed by the contract specifications, with the overall aim to develop and increase the capacity of kura and schools to implement Mātauranga Taiao programmes. The specific aims were to: increase the capacity of facilitators to implement Mātauranga Taiao into the educational programmes of the kura and schools that they work with; increase Mātauranga Taiao language proficiency and increase kaiako capacity to teach Mātauranga Taiao; provide access for kaiako to relevant research, pedagogy and quality teaching practice; and contribute to the development of Mātauranga Taiao resources.

The contract specifications appeared to specify relatively high-level outcomes which gave scope for outcomes to emerge at a local level rather than being imposed on Mātauranga Taiao students and young kura students. Awareness of needing to maintain the integrity of the Mātauranga Taiao kaupapa and the kaupapa of kura kaupapa Māori, was evident in one of the Mātauranga Taiao students' planning notes:

Māori-medium schools are forced to conform to the dominant culture's pedagogies and perspective of education. To ensure the unique special character of our schools [it needs to be] ... recognised [that] we require the resourcing to engage local knowledgeable people to deliver kaupapa pertinent to our area and geographical area, which would be relevant to the maramataka of [name of iwi]. (Mātauranga Taiao student)

A student I interviewed also spoke of how they were encouraged to draw from their local traditions:

Āe, ... me mihi ka tika au, he kaha rātou ki te opeope, ki te akiaki i a mātou kia waihanga kaupapa e hāngai ki ō mātou hapori kē. (Mātauranga Taiao student)

This is a useful approach, one that is consistent with the overall programme approach which was for the co-ordinators and participants to value the importance of localised knowledge and to co-construct knowledge about Mātauranga Taiao.

In light of this I present the outcomes that I saw generated during the period of the evaluation in two ways. First, I outline four thematic outcomes that were evident across all of the data I collected: co-construction of mātauranga Taiao; building support networks; curriculum development; and whole-kura change. In discussing these I also relate them back to the processes involved in the Mātauranga Taiao professional development programme since the philosophical underpinnings of the programme suggest that processes and outcomes are inextricably linked. Second, I highlight some of ways the students implemented aspects of Mātauranga Taiao in their own kura and schools.

1. Co-constructing mātauranga taiao⁴

In Chapter 4 I discussed how one of the ideas underlying the philosophical approach of the co-ordinators and the programme was of building knowledge together or “co-constructing” knowledge. This was evident in the pedagogical processes that the co-ordinators employed, and all co-ordinators suggested that they moved away, as much as possible, from a transmission of knowledge model to one of creating the knowledge together:

at the beginning we stress to them [the students] that they are—they are not going to be ‘fed’ ... maybe for a little while they’ll be ‘fed’, but they’ll be active facilitators as well. So that’s what the professional development looked like ... as much as we would be able to co-construct ... that’s what we planned.

(Mātauranga Taiao co-ordinator)

In reality, the delivery of Mātauranga Taiao in the first year of the programme began with more traditional didactic teaching where a wide range of guest speakers gave presentations to the participants, but this moved over time to supporting more of a focus on localised knowledge. One of the interviewees commented on this transition:

... but it wasn’t until our third national hui that they began to make comments like listening [to what ‘experts’ were saying about environmental education] is all fine and good, these models are all fine and good, where are the whakaaro Māori? ... and they’ve said we can’t deliver that, we can give you a lot of Māori literature in the area of the taiao—we’ve had a few speakers, Māori speakers in the area of taiao and we’ve had to because of the makeup of our team put it back to them and say who are the kaumātua within your rohe that can talk about these issues because they are there and the holding of these wānanga that’s where they’ve appeared because we can’t deliver that. (Mātauranga Taiao co-ordinator)

One of the main ways in which co-constructing knowledge was achieved was through encouraging students to draw upon the knowledge and skills of the people who were a part of their communities. Interviews and student evaluation forms suggested that a number of the activities and workshops focused on inquiry learning encouraging the students to involve members of their communities who had knowledge in a particular area relevant to their area of study. I saw several examples of students accessing knowledge and insights from kaumātua and the experts already in their communities—or the *puna*—to construct and inform their programmes. The following quote discusses a wānanga where Wiremu Tawhai, a well respected and knowledgeable kaumātua of Te Whānau-a-Apanui, and the principal of another kura who was also very knowledgeable about aspects of the bush, spoke at a gathering of kura-a-iwi representatives:

I tono mātou ki a Wiremu Tāwhai, ko ia tētahi o ō mātou kaikōrero i taua wānanga ka whakawhāiti ētahi kaiako i ngā kura kaupapa, kura ā-iwi o tō mātou rohe. Ka haere mai, ka noho tahi, kai tahi, ko ērā tikanga i runga i te whakaaro kotahi ... ko tōna kōrero e hāngai ana ki ngā kōrero a kui mā, a koro mā, ... tōna titiro ki te ao i a ia he tama i tipu ake kei waenganui i a rātou mā. I pērā hoki tō mātou kaikōrero tuarua ko Mac Manis, ko ia te tumuaki o Te Whāiti ināiane, ā, mīharo katoa au ki āna kōrero, he tangata matatau ki te ngahere, e hia ngā tauira PhD ka haere ki tāna taha kia ako i ētahi tūāhua a Te Wao Nui a Tāne. Koirā tētahi wānanga oranga ngākau, oranga wairua na te mea e hāngai ana ki tō tātou ao Māori. Pai noa iho kia haere ngātahi ngā ao e rua, I suppose, but ko te raru ko te ao Pākehā e tāmia ngā tohu ngā whakaaro tuturu Māori, te ihomatua Māori. Ā he uaua ki te kimi ngā tāngata e mātau ana ki te ao Māori me kī. (Mātauranga Taiao student)

⁴ I make a distinction here between “Mātauranga Taiao” and “mātauranga taiao”. “Mātauranga Taiao” is the name of the initiative and “mātauranga taiao” is a body of knowledge about the environment (human and nonhuman) that has been/is being drawn—largely, but not exclusively—from Māori epistemologies.

During the noho students were set tasks that encouraged them to draw upon the knowledge they had as individuals about their contexts. This is a good starting point but given the scope of Mātauranga Taiao there is a great deal for any one person to learn, again reinforcing the importance of drawing on the local resources. In one kura visited, for example, wānanga were being organised so that kaiako were exposed to knowledge that they then used to develop and implement their classroom plans and activities.

There appear to be at least two reasons for focusing on the co-construction of knowledge in the Mātauranga Taiao programme. Firstly, and most obviously, there is very little literature that makes explicit the connection between Māori knowledge and traditions and the environment, let alone in the context of education—Māori knowledge in this area is implicit. A kaupapa that focuses on te taiao needs to be able to draw on the knowledge and indigenous theories of sustainability from within Māori worldviews, traditions and korero. Secondly, the programme co-ordinators wanted to encourage Mātauranga Taiao students to draw upon the puna mātauranga that they have access to in their own communities; that is, “localised knowledge”.

This is a similar approach to other professional development programmes in Māori-medium education, for example in Ngā Toi and in Ngā Taumatua (Cooper, Bull & Campbell, 2006). These evaluations, and others, highlight the advantage of being less prescriptive and being open to drawing on the knowledge in each community and in the process validating this knowledge. If the knowledge to be included is highly prescribed there is no space left open for further knowledge to be brought to the centre of the educational process and so it remains marginalised. The approach used in the Mātauranga Taiao programme was enabling and so in its own way is contributing to the maintenance of local traditions.

The Mātauranga Taiao professional development programme did not just focus on building environmental/sustainability knowledge of Mātauranga Taiao but also on pedagogy designed to actively engage learners, both cognitively and practically. The Mātauranga Taiao students particularly enjoyed the experiential and co-operative strategies that were part of the professional training in the noho. The use of such strategies in the classroom, however, posed a number of challenges. One student I interviewed attempted to practise this type of pedagogy in the classroom but talked about some of the difficulties in doing this. One being that, in the short term at least, it seems to take a lot longer to make progress⁵:

... me whakatinana, engari me pēhea te whakatinana [child-centred learning]? Kei reira kē te raruraru i ētahi tāima. Mōhio ana ahau e oti pai ana i ētahi o ngā kaiako o konei, i haere tētahi kaiako i tētahi kura Pākehā kua ngaro i ahau te ingoa, he tino toa ia mō te hōatu, te tuku me kī te rangatiratanga ki ngā tamariki i roto i ngā take taiao nei, nā ki ahau e tae whakamātautau ana i tērā ki konei ka taka au ki roto i ngā kōrero katoa ka taea te taka ki roto, i hōhā ki ngā tamariki i pōturi anō i ētahi tāima. Heoi anō i konei koe e tatari ana kia kite rātou i tētahi mea e mōhio ana au mehemea e whakamāramangia atu e au ka kite rātou ki roto i te rima miniti. Engari ko te mea me waiho kia takahi rātou i te huarahi, kia whai i te hātepe, i te tikanga, he tino roa ka oti ētahi mea i ētahi tāima. (Mātauranga Taiao student)

It was also mentioned by this student that this was a practice that was being adapted from English-medium schools:

Ehara tēnei i te whakahē, ... Engari ki ahau nei ko tētahi mea me kī i āhua tohungia mai e [the co-ordinators] i te ao Pākehā ko ētahi o ngā huarahi whakaako. Nā ko tētahi mea nui e mōhio ana au i roto i te ao Pākehā, me te pai hoki ki ahau kia noho te mana ki ngā tamariki. Me noho rātou ki te pokapū o ngā mea katoa ki roto i ngā kaupapa taiao. (Mātauranga Taiao student)

⁵ For a discussion on concepts of progress see my paper and others in NZCER’s conference proceedings, *Making progress—Measuring progress* (Morton, 2008).

While what constitutes environmental/sustainability education is being reframed in Māori-medium education through the Mātauranga Taiao programme, further thinking and research are perhaps needed into what might constitute the most effective pedagogy in the context of Māori-medium education.

2. Building support networks

The co-ordinators I spoke to said that they focused on developing Mātauranga Taiao networks between students and by sharing contacts. This was seen as a way of supporting each other's programmes in the different kura, given that the number of people working in this area and with skills in this area is small. This outcome was also commented on by the students I interviewed for this study.

Students reported that their involvement in the Mātauranga Taiao programme led to them developing new networks to support their learning and their own students' learning in the area. In one of the sites I visited the student reported that the programme had led to her feeling empowered to approach people with different expertise to assist in the delivery of the taiao kaupapa in their kura. For example, her kura made a field trip to Auckland to visit well-respected scholars in the area of marine and biological sciences. She suggested that the Mātauranga Taiao programme had opened the doorways to develop these types of networks:

Kia rata mai rātou ki te ao mātauranga tonu ... kia noho rātou hei kaitiaki mō te ihi ā tōna wā. Kātahi ka hoki mai mātou ka here ō mātou tau rima me ētahi o ngā kaiopie o te hau kāinga i whakaritea Tākuta Mere Roberts, mā runga i tana inoi ki a ia he whakarite i tētahi kaupapa i Akarana. Nā reira i haere mātou ki reira mō ngā rā e whā ko tōna kaupapa i reira, me ngā kaikōrero ko Dr O'Shea e whakamōhio atu ki ā mātou tamariki āna mahi e pā ana ki ngā wheke nunui rawa. Koirā he tangata rongonui ia ki tērā mahi, rongonui ki te ao whānui. (Mātauranga Taiao student)

The networks that students found beneficial were not just networks with respected scholars, academics and practitioners in the area of environmental sustainability, but also with each other. For example, a cluster of kura, who had developed relationships as a result of their involvement in Mātauranga Taiao, from Waiariki (Rotorua), Mataatua (Bay of Plenty) and Te Tairāwhiti (the East Coast) arranged their own wānanga bringing well-respected and knowledgeable elders to share their knowledge around this kaupapa. This particular wānanga received coverage on Māori TV.

Finally, but not any less significantly, the networks being talked about here also refer to the communities within which the kura are located. It is assumed that schools have ongoing engagement and relationships with their communities. One of the kura I talked to had developed a relationship with the local iwi tribal council to further the mātauranga taiao kaupapa in the wider community. This in a sense became a "real-life" project, and the learning was meaningful, "real" and not contrived (see Gilbert, 2005).

3. Mātauranga Māori, Mātauranga Taiao and the Marautanga o Aotearoa

This particular programme creates an intersection of at least three discursive frameworks and systems of knowledges which are connected to one degree or another, though they are also quite distinct: Mātauranga Taiao, Marautanga o Aotearoa (the New Zealand Curriculum in te reo Māori) and mātauranga Māori (mātauranga Māori being here Māori traditions and the understandings of the world that have emerged from these traditions).

The co-ordinators reported that Mātauranga Taiao became a vehicle to deliver learning outcomes from the other curriculum areas in Marautanga o Aotearoa. One of the guest speakers at the noho was brought in specifically to show students how to make links with other curriculum areas whilst also maintaining the focus on mātauranga taiao:

We brought in [name of educator] to explore ... linking it [Mātauranga Taiao] to different curriculum areas ... like hauora ... (Mātauranga Taiao co-ordinator)

Importantly, however, in the view of the co-ordinator, students saw ways of making the marautanga fit Mātauranga Taiao, not the other way around:

everything's [in the curriculum] incorporated into a Mātauranga Taiao kaupapa ... and now having the opportunity with Mātauranga Taiao, clearly it's saying, ... we don't have to operate in those boxes. We can meet those, we can meet our literacy, ICT, numeracy needs for our kids through this ... (Co-ordinator)

The next dialogue illustrates how the kaupapa (themes/learning areas) are chosen that link to the curriculum but are driven by the iwi and kura:

Interviewer: Ka pēhea te whakmahere i ngā kaupapa a te kura, ngā mea whai pānga ki te marautanga, ko ngā mea matua ko ngā kaupapa, ko ngā wahanga rānei o te marautanga?

MT student: Ngā kaupapa.

Interviewer: Ngā kaupapa.

MT student: ... ka mahi ngā kaupapa ki te marau ... Ka hono atu ki te marautanga. Āe ... koirā ko te iwi o [name of iwi] kei te whiriwhiri tonu me pēhea te whakatakoto pātuhi me kī, te rangahau hoki tō rātou maramataka ake ... e ai ki ngā pakeke, tō rātou nā curriculum o [name of iwi] ... i haere ahau ki te āwhina, mahi tahi mātou me te rūnanga tonu, ko te [iwi tribal council]. Ki te kimi huarahi kia whai huruhuru rātou te tonu tangata kia āta noho te rangahau kua whakatakoto taua marau mō te kura.

Both the Mātauranga Taiao programme and the Marautanga o Aotearoa (the New Zealand Curriculum in te reo Māori) are, in theory, supposed to be informed by mātauranga Māori. However, the extent to which this actually has occurred is still an open question.⁶ Mātauranga Taiao, having more recent origins and being inherently more holistic than the other learning areas in the Marautanga o Aotearoa, was seen to have greater potential to incorporate more mātauranga Māori in a way that maintains the integrity of mātauranga Māori. For example, the Mātauranga Taiao national co-ordinator explained that students reported that they were able to centre Māori knowledge in the learning process related to mātauranga taiao:

... what we saw [was] empowerment, that is an integrated approach to the curriculum ... it's probably about the most powerful inroad they have at the moment to advocate for mātauranga Māori in the curriculum. (Mātauranga Taiao co-ordinator)

Interestingly, there are other ideas that I could explicate from this statement. The suggestion that it is important to advocate for mātauranga Māori suggests that these spaces do not already exist within the curriculum, even within kura kaupapa Māori. If there is a view that we need to advocate for mātauranga Māori this would suggest that its position is tenuous, well certainly more tenuous than other knowledge(s) that are centred and privileged in the curriculum. Mātauranga Taiao is thus contributing to a re-centring of mātauranga Māori in kura curriculum.

⁶ Critiques of the Māori-medium curriculum have argued that earlier iterations to incorporate Māori knowledge into the curriculum have been problematic—one part of the criticism being that mātauranga Māori was just an “add on” and was really only on the periphery of what was seen as “real” knowledge (see Barker, 1999; McKinley & Waiti 1995). Initial investigations into the new Marautanga o Aotearoa offer little hope that this situation has substantially changed.

4. Kura kaupapa Māori, kura motuhake, kura-a-iwi, kura taiao?

In addition to co-constructing mātauranga taiao through accessing local knowledge and developing specific learning programmes with links to the Marautanga o Aotearoa, interviewees also spoke about how their involvement in the Mātauranga Taiao programme had led to changes within their kura. For example, in the kura of one of the Mātauranga Taiao students, all of their learning programmes were now based around the taiao themes. The kura is small and in a rural setting and was able to go on a number of school trips that focused on the taiao kaupapa. This Mātauranga Taiao student, who is also the tumuaki, mentioned that the kura wanted to become a kura taiao—an Enviroschool. The other kura I visited was already an Enviroschool. They both felt that they had become “inspired” to carry on the kaupapa whether or not they would receive ongoing funding or time to focus on this kaupapa directly through professional development.

A feature of our discussions with the co-ordinators and students of Mātauranga Taiao was the possible emergence of a new type of kura. Since the establishment of kura kaupapa Māori (kura that according to the official legislation subscribe to the Te Aho Matua philosophical and pedagogical statement) during the late 1980s, other kura have begun to emerge. There has been the development of “kura-a-iwi”; that is, kura that centre and privilege the traditions, language and beliefs of the tribe within whose boundaries the kura is located and draws the majority of its students from. In the last two years these kura have established a national representative council. The national co-ordinator felt that there is the possibility of another new type of kura emerging out of this professional development programme and exposure to issues vis-à-vis the environment. At least two students of the programme have expressed a desire to establish kura with a taiao focus—a kura taiao. Students we talked about had said that they would like to reposition the focus of the kura they worked in, or establish new kura that had a taiao focus. Students also felt that the two kaupapa were not incompatible and that in fact they saw this as a way of meeting some of the original goals of kura kaupapa Māori.

5. Development of Mātauranga Taiao outcomes for Mātauranga Taiao students, kura and young kura students

The national co-ordinator reported that the Mātauranga Taiao students were able to “describe not only shifts for themselves, but for their kids, their kura [and] for their community”. Students were asked to make a presentation at the last noho to demonstrate the types of shifts that had occurred for them as students, their students and their kura. Mātauranga Taiao students were asked to report specifically on:

1. promoting the introduction of Mātauranga Taiao to enrol, and engage individual teachers and syndicates leading to whole-school implementation
2. planning, implementing and assessing effective school/classroom programmes to increase student learning outcomes in Mātauranga Taiao
3. developing material, i.e., units of work based on Mātauranga Taiao, to be presented at national hui and on Mātauranga Taiao online.

Both of the students of Mātauranga Taiao whom I interviewed had started on a pathway of implementing and incorporating Mātauranga Taiao in their learning programmes. The different contexts in which they worked influenced the implementation of the programme in their respective kura. One of the kura was small and therefore it was easier to transform the school programme to focus on mātauranga taiao, whilst at the same time meeting other curriculum outcomes. This student had already presented the Mātauranga Taiao kaupapa to the kura whānau and board of trustees (BoT) who supported the implementation of Mātauranga Taiao into the kura:

[Name of kura] kua oti te whakatakoto te pūrongo Mātauranga Taiao ki mua te aroaro o ngā kaiako, Hui Whanau me te Poari. Ka tautoko tonu ngā mātua, ngā kaiako, te poari, kia u tonu ki tēnei kaupapa. (Mātauranga Taiao student)

It was relatively easy then, because of the small size of the kura, to adjust the programme to centre Mātauranga Taiao across the whole of the kura.

In the second kura, however, the Mātauranga Taiao student was tasked with implementing the programme across the kura. This meant developing a school-wide programme in consultation with the kaiako and tumuaki and then providing resources for the kaiako to use in the implementation of Mātauranga Taiao:

Nō reira ko mātou katoa ka whakaako i te mea kotahi i te wā kotahi. Nā, ki ahau nei koinā tētahi o ngā mea nui. Kia whakaaetia kia whakahuria tētahi kaupapa taiao ko tāku he rapu i ngā rauemi hei āwhina i ngā kaiako. (Mātauranga Taiao student)

The task was made easier in the 2008 year because the student was able to access teacher release day funds through Mātauranga Taiao to free himself to prepare the programme and gather resources:

... i kite atu au e kore rawa e taea e au, mēnā e kore au e whakawāteangia, he nui rawa nō ngā mahi ... Nā koirā ahau i tino waimarie ai i roto ahau i te kirimana mātauranga a Hiria mā, i te mea he moni ā rātou me ngā rā whakawātea kaiako. Nā ka tono ahau ki a Hiria, i inoi ahau ki a Hiria kia hōmai [putea, hei] whakawātea. (Mātauranga Taiao student)

The classroom-based programmes implemented by the students of the Mātauranga Taiao programme illustrated many of the ideas highlighted in the noho. These included: communicating the key ideas with the BoT and kura community; setting projects within the local environment; drawing on local experts; and providing rich tasks that required the young kura students to be actively engaged in learning about the environment. The units of work reported by the Mātauranga Taiao students covered topics such as: recycling; gardening activities, including research into kumara as well as growing and harvesting; learning about the local vegetation and Māori medicinal uses; and investigations into energy use and water quality/health.

The way these programmes were implemented varied. In one kura, Te Taiao was the central organising framework for thematic studies that incorporated the other curriculum areas of: hauora; te reo; hangarau; nga toi; and putaiao. Young kura students from Years 1–7 undertook a range of activities such as: discussing whakataukī about matariki; visiting a local forest area with a kaumātua and learning about medicinal qualities; making rope from flax, learning how to strip, rub and bind it; and investigating establishing school gardens. The latter involved a visit to the local government gardens to determine the kind of garden the students wanted for their kura and later the students drew a design of their optimal school garden. On reflection the teacher commented that it was rewarding but challenging to implement integrated curriculum programmes, and that it takes much more time to work in this way than initially anticipated. In another kura, a study of water included investigating: waiora; the importance of fresh water both locally and internationally; and water testing techniques. The study included testing the local water supply. The recycling work of another Mātauranga Taiao student also showed evidence of the ideas conveyed through the programme. In this case the young kura students involved the BoT and their whānau in their project as well as writing to the local council to advocate for recycling bins.

In these early days of the programme there was a strong sense from the final programme evaluations that students found working within a Mātauranga Taiao kaupapa to be very rewarding for them and their young kura students. There was the feeling that the approach made sense and that it “is an integral part of school life: you live it; the school community lives it; and it becomes an integral part of school curriculum as well”. One participant thought that the programme had

“empowered me with the knowledge that I am doing the right things with my children and the school. Grounding them with the foundations e pā ana ki tā tātau ao Māori.” At the same time it was acknowledged that there was much more to learn, and that the support provided by the co-ordinators was critical. While the evidence provided by the students documents the activities undertaken by their own students, the actual impact on learning is beyond the scope of this evaluation. Just as in the other EfS programmes, more research and thinking are needed about what might be useful measures of student progress in terms of learning what is valued within mātauranga taiao kaupapa.

7. Wider connections with EfS: How does Mātauranga Taiao relate to overarching EfS goals and other EfS programmes?

Relationship between these outcomes and overarching EfS goals

The Mātauranga Taiao programme was guided by the overarching goals of Education for Sustainability. The primary focus, however, appeared to be on the students learning within the context of the aims of the Mātauranga Taiao programme and then on making connections to the overarching Education for Sustainability goals.

There was general consensus amongst the co-ordinators that there was much in common between Mātauranga Taiao, the EfS overarching goals, and the national and international literature about environmental/sustainability education. The national co-ordinator felt that the goals of Mātauranga Taiao and EfS were not too dissimilar and referred back to the whakataukī which encapsulated the vision of EfS, “Oranga tangata, oranga taiao” (“Wellbeing of people and the environment”). The co-ordinators had, of course, been involved for at least three years prior to the establishment of Mātauranga Taiao in national discussions about environmental/sustainability education, and were therefore very familiar with the national and international literature and about environmental issues in general.

However, the main focus for this programme was on building mātauranga taiao and practices which assist in meeting the overall aims of Mātauranga Taiao. It needs to be remembered that mātauranga taiao, although drawing from a large body of knowledge and practices from Māori epistemologies, is very much a new initiative within education, and it will take time to build the knowledge and best practices.

There was a tension raised around how Māori knowledge was incorporated into discussions and documentation around the goals and objectives of EfS, which is discussed in a little more detail in the next chapter.

Relationship with other EfS programmes

There was some interaction with the other programmes in the area of Education for Sustainability, and for the most part this was respectful and mutually beneficial. These interactions, however, were limited, perhaps because of time pressures rather than any other potential obstacle.

There was an active relationship with Te Mauri Tau, an organisation that partners with Enviroschools, and that provides environmental/sustainability education support and develops teaching resources in te reo Māori. One of the Mātauranga Taiao co-ordinators was involved in the development of *Te Kete Taiao*, a resource kit for Māori educators developed by Te Mauri Tau, and both regional co-ordinators attended a professional development hui for its implementation. All were enthusiastic and complimentary about this particular resource, seeing it as valuable for Māori-medium and environmental/sustainability education.

Mātauranga Taiao interviewees suggested that they and Te Mauri Tau see themselves as offering something different, complementing each other’s work rather than competing. Te Mauri Tau delivers their programme directly into kura that seek their support with regard to Māori perspectives and knowledge around sustainability. Mātauranga Taiao specifically trains kaiako and Resource Teachers of Māori to be builders of knowledge and facilitators of Mātauranga Taiao in kura throughout the country by drawing upon local knowledge. This is not to say that Te Mauri Tau doesn’t

draw on local knowledge, however the difference between the two could be put, in my view, as one placing an emphasis on personnel and resources to deliver knowledge and the other, in its development phase, putting more emphasis on building knowledge.

8. Future directions: What issues and opportunities emerged as the programme develops that might provide guidance for the future?

In this chapter I outline three challenges that emerged during the evaluation which deserve further consideration for the ongoing work of Mātauranga Taiao and potentially other professional development programmes. Then I offer a range of suggestions for the future, based on our overall analysis and knowledge of Māori-medium education settings.

Challenges

Epistemological issues

EfS, including all three main components of the EfS initiatives, draw from at least two quite different epistemologies—specifically Māori and Western epistemologies. The inclusion of Māori knowledge and traditions has been an educational practice in the New Zealand context that dates back to the early 20th century.

During the noho, people with expertise in a range of areas were brought in to share their knowledge and expertise with the Mātauranga Taiao students. The students mentioned that they felt privileged to meet and hear these people (for example, the speakers were the second most popular aspect of the programme content the students reported in the programme evaluation). However, while their knowledge was respected sometimes students found it hard to make the connections with this knowledge and expertise, and mātauranga taiao as they understood it from a Māori point of view. The following quote from one of students illustrates the difficulty in trying to develop a Māori view of te taiao when they were exposed to experts of Pākehā knowledge:

Koirā tētahi o ngā wero i whakatakoto au ki mua i te aroaro o ngā kaiwhakahaere o te Mātauranga Taiao.
Nā te mea ko te nuinga o ā mātou ka mahi ki roto i te mōtera e hangai ana ki nga tino [mea] o te ao
Pākehā tonu. I mea atu, kei hea te whakaaro tūturu Māori? You know?

This is a tension that I highlighted in the interim report. I cited Nakata (2007) who argues that indigenous and nonindigenous knowledge systems are “incommensurable”, that is, they are so different that they cannot, and do not “talk” to each other. He argues that when indigenous knowledges are “added” *into* nonindigenous curriculums—as in the case of EfS—they are entering into “contested knowledge spaces” at the “cultural interface” and inevitably indigenous knowledges are assessed in terms of their validity and usefulness against Western standards. Ultimately it has the effect of reconfiguring Māori knowledge and concepts to conform to Western standards, and it positions indigenous knowledges as inferior to Western knowledges.

There are perhaps a number of things that we could say and questions that we could ask about this. When students are confronted with different knowledge systems, they have at least two choices. They can completely disregard the new knowledge, or they can place it alongside what they already know, and how they already know, and try to find a place for this new knowledge. In the process their previously established knowledge will change as will the knowledge they have been exposed to. In this Mātauranga Taiao programme students’ epistemologies were continuously faced with difference, and challenged. It makes the conceptual and intellectual load very high, as the students seek ways to live

with these tensions and as they consider what they are wanting their own students to learn in their kura-based mātauranga taiao programmes.

Pedagogical issues

It is not only content knowledge that offers a challenge within the context of Mātauranga Taiao, so does the nature of the pedagogical content knowledge. One of the aims of the programme was to build knowledge of effective pedagogy and a number of students commented on the value of learning more about experiential, co-operative and inquiry learning. The need to attend to pedagogical content knowledge is not unexpected given the compelling evidence in recent years about what constitutes quality teaching (see, for example, Alton-Lee, 2003) and so the ongoing need to re-examine practices. However, given the demands of teaching in this more interactive way the opportunity for continued conversations and sharing is essential if it is to be sustained. There is an additional conversation needed in the context of Māori-medium education. As suggested earlier, the teaching approaches utilised need to be consistent with Mātauranga Taiao kaupapa, which is similar but not the same as EfS, and so there is a need to “define our own” version of appropriate pedagogy, as has begun with the content of the programme. There is yet another demand on the kaiako working in Māori-medium contexts, this time in terms of continuing to build the language required in terms of the content being investigated and in relation to the young kura students’ own language development. If you add these pedagogical challenges to the epistemological ones the demands of Mātauranga Taiao on participants is very high indeed.

Tensions in the positioning of mātauranga taiao

Related to the potential for epistemic tensions within the Mātauranga Taiao initiative, several interviewees within and beyond programme staff raised concerns about the way that mātauranga taiao was represented and delivered in English-medium schools and professional development programmes. While, as we saw in Chapter 3, the development of Mātauranga Taiao was hoped to address issues with regards to EfS support in Māori-medium schools, programme staff and others are often called upon to provide Māori knowledge for school-based EfS resources, policies and professional development. However, this is often experienced as difficult territory or is in a similar vein to how Smith (1999) describes the research process for indigenous scholars in intercultural situations, as “tricky ground”. Ultimately there is a concern that some EfS learning experiences will have negative impacts on those Māori children in mainstream education. This can occur if Māori knowledge is presented in ways which are foreign to them, from a person in a position of power, as there then is the potential for Māori students to question their own experiences and understandings (see Penetito, 2004). Although they are not contractually responsible for English-medium education, Mātauranga Taiao staff clearly see this as a concern and that there is a need to address this in a more substantive way.

Suggestions for the future

- Mātauranga Taiao is obviously an emerging area of work. I stated in the interim report that I think the potential contribution of the development of Mātauranga Taiao to, not just the Māori community, but nationally, is important. It is a part of New Zealand’s unique contribution to Education for Sustainability internationally. The programme requires continued support to enable it to fully realise its goals. We believe that this will take time.
- Mātauranga Taiao is ambitious and complex. It is aiming to build participants’ environmental/sustainability knowledge within a Mātauranga Taiao kaupapa as well as providing access to research and pedagogy about quality teaching practices. Participants are expected to not only plan and implement programmes within their own classrooms but also to act as facilitators within their kura and schools and in their nearby community. These are all important goals and while some participants are working across kura and schools, more time is needed for most participants to consolidate their own knowledge and experience before taking a lead role as facilitators themselves.

- Mātauranga Taiao needs to be staffed adequately in order to meet its not insignificant goals. The retirement of one of the regional co-ordinators during the course of the programme and one at the completion of the programme is significant and unfortunate. There are few people who have the expertise in this area and a strategy needs to be developed to ensure that the programme is staffed adequately throughout the course of the programme and to enable the building of collective knowledge in this important area of education. In this initial phase of the programme the follow-up and support visits to students were not as comprehensive as they could have been and needed to be. This limited the opportunity for supporting the ongoing work of the participants and for reinforcing the collective work within the programme.
- More thought and consideration needs to be given to epistemological tensions. If we are able to address these tensions effectively we may realise a fuller, richer contribution of mātauranga Māori to Mātauranga Taiao, and EfS generally. As it stands it is unlikely to happen in either the Mātauranga Taiao programme or the English-medium EfS programmes. One way of doing this is to make the “cultural interface” something that is spoken about and discussed and not reconciled internally within each of the programmes.

Conclusion

One of the main themes that has become apparent in this evaluation of the Mātauranga Taiao professional development programme is that it is still very much negotiating its own space under the banner of Education for Sustainability in a way that brings together and/or incorporates mātauranga Māori and Te Marautanga o Aotearoa. The programme co-ordinators have been very careful not to impose a particular understanding of mātauranga taiao given it must intersect with not only mātauranga Māori, Te Marautanga o Aotearoa and EfS generally, but also the knowledge and traditions of the communities in which the programme is being implemented. A key reason for this has been the need to ensure that the knowledge and programme is contextually sensitive and relevant. Further, there is a strong belief—and this is supported by at least one international scholar in the area—that if the traditions and kōrero of the local people are strong, then so too will be the environment. The programme co-ordinators have been keen to allow specific goals and outcomes to emerge from their contexts. That said, there are other types of outcomes that Mātauranga Taiao appears to be achieving. There is greater awareness of the taiao and a greater willingness to centre learning programmes on developing care for, and understanding of, the environment. Mātauranga Taiao students have also been provided with tools to access, build and construct mātauranga taiao with their kura and their local contexts. However, the journey has just begun. If Mātauranga Taiao itself is to be sustainable the potential network established through this programme needs further nourishment. This will enable those involved to continue to learn and to share their growing knowledge with each other and the wider community working in the area of Māori-medium education.

9. References

- Alton-Lee, A. (2003). *Quality teaching for diverse students in schooling: Best evidence synthesis*. Wellington: Ministry of Education.
- Barker, M., (1999). The Māori language science curriculum in Aotearoa/New Zealand: A contribution to sustainable development. *Waikato Journal of Education*, 5.
- Barlow, C. (1991). *Tikanga whakaaro: Key concepts in Māori culture*. Auckland: Oxford University Press.
- Battiste, M., & Youngblood Henderson, J. (2000). *Protecting indigenous knowledge and heritage: A global challenge*. Saskatoon, SK: Purich.
- Best, E. (1995). *Māori religion and mythology Part 2*. Wellington: Museum of New Zealand Te Papa Tongarewa.
- Cooper, G. W., Bull, A., & Campbell, R. (2006). *Ngā Taumatua Whakapakari evaluation*. Unpublished report commissioned by the Ministry of Education.
- Eames, C., Roberts, J., Cooper, G. & Hipkins, R. (in press). *Education for sustainability in New Zealand schools: An evaluation of three professional development programmes*. Report prepared for the Ministry of Education.
- Gilbert, J. (2005). *Catching the knowledge wave? The knowledge society and the future of education*. Wellington: NZCER Press.
- Law, B., & Baker, R. (1997). A case study of dilemmas and tensions: The writing and consultation process involved in developing a national guideline for environmental education. *Environmental Education Research*, 3(2), 225–232.
- McKinley, E., & Waiti, P. (1995). *Te tauaki marautanga pūtaiao: He tauria—The writing of a national science curriculum in Māori*. SAME papers, 75–94. Hamilton: Centre for Science, Mathematics and Technology Education Research.
- Mead, H. M. (2003). *Tikanga Māori: Living by Māori values*. Wellington: Huia Publishers.
- Ministry of Education. (1999). *Guidelines for environmental education in New Zealand schools*. Wellington: Author.
- Morton, J. (Ed.) (2008). *Making progress—Measuring progress*. Conference proceedings. Wellington: NZCER Press.
- Nakata, M. (2007). The cultural interface. *The Australian Journal of Indigenous Education*, 36, Supplement 2007, 7–14.
- Penetito, W. (2004, November). *Theorising a 'place-based' education: Ahakoā kai tahi, tērā a roto te hahae kē ra*. Keynote address to NZARE conference, Westpac Stadium, Wellington.
- Skutnabb-Kangas, T. (2000). *Linguistic genocide in education—or worldwide diversity and human rights?* New Jersey: Lawrence Erlbaum.
- Smith, L. T. (1999). On tricky ground: Researching the native in the age of uncertainty. In N.K. Denzin and Y. S Lincoln. *Handbook of qualitative research* (3rd ed.). Sage Publications.

