**BECOMING A SUSTAINABILITY CHEF:
AN EMPIRICAL MODEL OF SUSTAINABILITY PERSPECTIVES IN
EDUCATIONAL LEADERS**

by

Maud Kathleen (Kate) Moss Gamblin

**A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy
Department of Curriculum, Teaching and Learning
Ontario Institute for Studies in Education of the
University of Toronto**

© Copyright by Maud Kathleen (Kate) Moss Gamblin 2013

**BECOMING A SUSTAINABILITY CHEF:
AN EMPIRICAL MODEL OF SUSTAINABILITY PERSPECTIVES IN
EDUCATIONAL LEADERS
Doctor of Philosophy, 2013
Maud Kathleen (Kate) Moss Gamblin
Department of Curriculum, Teaching and Learning
University of Toronto**

Abstract

This dissertation reports a study exploring adult engagement with sustainability learning practices in EcoSchools-certified secondary schools in Canada, Lithuania and Sweden as a means towards shaping a liveable future. The study is situated in the area of education for sustainable development. The study design was initially based on an interest in revealing specific practices of sustainability education as a means of improving the relationship between environmental impact and wealth. While echoing findings in the existing literature, this research contributes to the development of the field through insight into the perspectives that adults bring to sustainability education.

Primary data collected in the spring of 2006 were recorded (mostly single) semistructured interviews with 30 individuals (national coordinators, caretakers, teachers and administrators), including 10 Canadians from four schools, 14 Lithuanians from four schools, and six Swedes from two schools. Four phases of qualitative analysis were used on the data: initial transcript coding and trends; précis document trends; a six-stage model of interview responses allowing vertical (between question) and horizontal (between stage) comparisons; word maps of subthemes as a scaffold to detail participants' four primary views (long, wide, deep, dynamic) regarding sustainability.

Ultimately, the results of this study point less than expected to revealing specific transferable practices regarding success and challenge in EcoSchools. Rather, these findings provide some insight into a means of shaping a sustainable future through an individual's sustainability perspective: a living responsiveness based on a sense of connection, supported by improved sustainability cognition, and realized through sustainability practice and considered engagement.

Dedication

This thesis is dedicated to my father, Richard Clare Moss, a sailor of keen sight who has been able to see the navigation buoys along the way, steadily guiding me when my own vision failed. Many thanks and much love, Dad!

Epigraph

Julia Child's enduring guidance regarding both constituents and process at her 100th birthday celebrations. Cardullo's, Cambridge, Massachusetts, 15 August, 2012.

Acknowledgments

The project that is this thesis has taken me across years of exploration and I find myself in the happy position of owing many debts of gratitude. First and foremost, I would like to express my gratitude to our beautiful, incomparable, infinitely fascinating planetary home as a source of life, inspiration and solace. My thanks go to the 30 participants who so generously gave of their time and insight, affording me my primary data. Thank you for so freely sharing with me your hard-won insights as both educators and practitioners of ESD. Thanks also go to those who advised me in the first years of my program, including the late Rodney White, Edmund O’Sullivan, and the late Joseph Farrell; your guidance is embedded in this document and it is stronger for it. I would like to extend warm gratitude to Peter Victor, Justin Dillon and John Boardman who kindly met with me at various stages of this project, most particularly its design phase. Thanks also to my committee members, Mark Evans and Erminia Pedretti, for your time and expertise; any errors or omissions are mine alone. Particular thanks go to my supervisor, Dennis Thiessen, for being such a dedicated reader, memo writer par excellence, and authentic educator all along the way.

There are a large number of educators, scientists, and government officials who join the cast of my friends and extended family members, contributing in large and small ways over the years to the shaping of this project. Thanks are owed to each of these individuals who live in various nations, as well as to the community of the Comparative, International and Development Education Centre (CIDECE) at OISE for providing sustenance both intellectually and socially. Some have passed on to the great majority, including my marvelous mother Patricia Moss, who shared her creative vision and innovative interpretive skills from the outset of my life. Special thanks to Charles

Hopkins (Canada), the late Vaiva Vėbraitė (Lithuania) and Carl Lindberg (Sweden) for your guidance at crucial junctures on my research trip. I am grateful to Tree Canada for offsetting the emissions incurred during my overseas research. I would also like to thank Aldona Vosilute, whom I had met during the APPLE program in Lithuania, in July 2005, and who translated my research documents for the Lithuanian participants. Sincere thanks go to the professionals who met with me during the design phase of this research project in October 2005: Daniel Esty, Robert Costanza, Joshua Farley and Jaimie Cloud. Special thanks are owed to Wadham College, Oxford, where I began my journey as a professional educator and where I was graciously afforded library and residential space during the final writing up of this thesis. It is an environment I have always found to bring a balance of quiet scholarship and lively society – with superb opportunities to enjoy sung evensong throughout Trinity term 2012!

My time overseas (indeed, my time researching in Canada) would not have been the same without my adopted British families, The Smiths and The Pearces: heartfelt thanks! You remind me of the great value to life's enjoyment in circles of friendship within the Chiltern Hills and beyond. To my friend Emma Jaikaran and my cousin Laura Moss, enormous thanks for your clear-sighted, unwavering and generous guidance. To my brother Patrick Moss (1967–2010), my heartfelt thanks for being such a skillful sailor, able to single-handedly navigate Dad's boat Siyo through the waters of the Georgian Bay at the same time as steering me in thesis discussions. As my friend Terence Bredin might say, a final encomium from 'Wadham' to her 'Wrangler': my beloved husband Tom Moss Gamblin, all my love, all my gratitude, are owed to you for your special gifts and for the daily light and joy you bring to me. Thank you!

Table of Contents

Abstract	ii
Dedication	iii
Epigraph	iv
Acknowledgments	v
List of Tables	xi
List of Figures	xii
List of Acronyms	xiii
List of Appendices	xiv
 Chapter 1: Introduction	1
Prelude to the Study	1
Research Focus	7
Research Question	7
Abstract of Methodology	8
Pilot study	9
Site visits and interviews	9
Methodology of analytic phases	10
Case Selection	10
Why the EcoSchools program?	11
Why these participants from these three nations?	12
Significance of the Study	15
Substantive Insights	15
Significant Methodological Innovations	17
Organization of the Thesis	18
 Chapter 2: Charting the Context for a Liveable Future Through Environment and Economy	20
Introduction	20
Contextualizing ESD's Three Spheres	22
Environment	25
Emergence of Wider Perspectives	27
Limits to Growth: Sustainability vs Overshoot	31
Economy	36
Not Foregrounding Growth	39
Indicators and Genuine Progress	40
Kuznets, Curves, and the Economy	47
Climate Change: The Anthropogenic Factor	49
Economic Consequents	52
Conclusion	54
 Chapter 3: Charting the Context for a Liveable Future Through Learning	56
Introduction	56
Framing the Learning Context	59
Valuing Less Protocol-Based Approaches	60
Meaning Through Language	62

Perceiving the World Through Love, Not Loss.....	67
The Sense of Wonder.....	72
Thinking.....	85
Cognition in an Environmental Context	88
Childhood Experiences Informing Adult Perspectives.....	90
Fostering Cognitive Development in Practice	93
From Thinking to Action	98
Principles for Action and Change	104
The United States: Creativity and Change.....	107
The United Kingdom: National Strategies.....	111
Instances of lived experiences in British schools	115
A stage model for learning for sustainability.....	123
Conclusion	128
Chapter 4: Research Methodology.....	129
Introduction.....	129
Methods Context.....	130
Research Paradigms and Traditions.....	131
Role of Researcher.....	136
Methods in Action.....	139
Collecting Data	139
Research questions.....	140
Pilot study	140
Triangulation.....	141
Nations chosen	143
Process considerations	144
Interviews.....	145
Projection techniques	153
Transcription	154
Field notes	155
Analyzing Data	161
General analytic strategies	161
Key-word-in-context (KWIK) and word maps.....	164
Coding.....	165
Style of response	166
Memoing	168
Interpretation as method: beyond constituents to process	170
Phases of Analysis in this Research.....	172
Phase 1	173
Phase 2	174
Phase 3	177
Phase 4	178
Methods Considerations.....	179
Research Quality and Ethics	179
Limitations	185
Conclusion	186

Chapter 5: Overview of Data Analysis.....	187
Introduction.....	187
Initial Analysis of Data	189
Phase One Analysis.....	189
Phase Two Analysis.....	191
Phase Three Analysis and a New Means of Comparison	195
Analysis of Thick and Thin Response Cohorts.....	196
Horizontal Analysis of Six Stages	198
Using the Stages Model as a New Means of Comparison	202
Phase Four Analysis of the Data.....	206
Conclusion	207
 Chapter 6: Vertical Analysis of Data	 208
Introduction.....	208
Subthemes Occurring in Responses.....	209
Responses to Questions 1–10 in Overview.....	213
Subtheme Analysis of Responses to Questions 1–10	214
Interpretation Strand	217
Q1, Interpretation.....	217
Connection Strand.....	222
Q2, Connection	223
Q3, Connection (Book Excerpt)	230
Q4, Connection (AQ2b).....	234
Q5, Connection (AQ2d).....	238
Engagement Strand	241
Q6, Engagement (AQ3a)	241
Q7, Engagement (AQ3c Part A)	244
Q8, Engagement (AQ3c Part B)	249
Q9, Engagement (AQ4a)	253
Q10, Engagement (AQ4c/d)	256
Conclusion	259
 Chapter 7: Horizontal Analysis of Data.....	 261
Introduction.....	261
Participant Portraits.....	261
Stage 2 Portraits	264
Stage 3 Portraits	272
Stage 4 Portraits	278
Stage 5 Portraits	289
Stage 6 Portraits	310
Graphical Analysis of Subtheme Data for All Six Stages	331
Comparative Summary of Findings from Chapter 6 and 7.....	335
Conclusion	340
 Chapter 8: Analysis of Views	 343
Introduction.....	343
Arising of the Views	344
The Long View: Focus on Topophilia and Leadership	352
Literature and the long view	352

Participants and the long view	354
The Wide View: Focus on Choices	362
Literature and the wide view.....	362
Participants and the wide view	363
The Deep View: Focus on Responsibility, Motivation, Independence and One Person.....	368
Literature and the deep view.....	368
Participants and the deep view.....	371
The Dynamic View: Focus on Thinking.....	376
Literature and the dynamic view.....	376
Participants and the dynamic view	380
How the Views Work Together	388
Conclusion	391
Chapter 9: Conclusion.....	393
Introduction.....	393
Summary of Outcomes, Findings, and Methodological Developments	393
Key Outcome: Proposed Model of Sustainability Perspectives	396
Key Outcome: Proposed Portfolio of Views	398
Key Finding: Insights into Sustainability Learning Programs.....	400
Key Finding: Characteristics of the Emerging Sustainability Chef.....	402
Methodological Developments	406
Considering the Results	413
Critical Evaluation of the Study.....	418
Future Directions	421
Implications for Future Research.....	422
Implications for Policy.....	424
Essential Questions	424
Conclusion With Hope.....	425
References.....	432
Appendices.....	474

List of Tables

Table 1	Comparison of Canadian and International EcoSchools Projects in 2006	11
Table 2	Illustration of Gayford’s Four-Stage Model for Knowledge and Action	125
Table 3	Summary of Participants by Nation and Role	146
Table 4	Terminology for Results Chapters	187
Table 5	Characteristics of Stages	199
Table 6	Summary of Participants’ Stage by Nation.....	201
Table 7	Summary of Stage of Participants by Role.....	204
Table 8	Characteristics of Participants’ Holistic Views	206
Table 9	Glossary of Subthemes	210
Table 10	Questions for which All Responses are Thick within Role/Nation	214
Table 11	Average Number of Thick Responses by Stage	216
Table 12	Number of Word Maps Including Repeating Subthemes, as Contributing to Views	279
Table 13	Comparisons of Schools by Stage and Role, across Nation	336
Table 14	Comparisons of Participants by Stage and Role, across Nation	338
Table 15	Insights into Sustainability Learning Programs.....	401
Table 16	Characteristics of Sustainability Chefs	403

List of Figures

Figure 1 Metrics regarding Canada, Lithuania and Sweden.....	14
Figure 2 Comparing EE and ESD perspectives.	66
Figure 3 Relationships among stages in the cycle of grief.	70
Figure 4 The action equation.	103
Figure 5 Participants' ages and years of experience (l) by nation; (r) by role.....	147
Figure 6 Précis documents: (l) some participant strips; (r) one sample square.	175
Figure 7 Stage of participants by nation.	203
Figure 8 Relationship of subthemes for CA-Teach7.	265
Figure 9 Relationship of subthemes for LT-Teach1.....	268
Figure 10 Relationship of subthemes for SV-Admin1.	270
Figure 11 Relationship of subthemes for LT-Admin3.....	273
Figure 12 Relationship of subthemes for SV-Care.....	275
Figure 13 Relationship of subthemes for CA-Teach4.	280
Figure 14 Relationship of subthemes for LT-Teach5.....	283
Figure 15 Relationship of subthemes for SV-Admin2.	287
Figure 16 Relationship of subthemes for CA-Admin1.....	291
Figure 17 Relationship of subthemes for CA-Teach1.	296
Figure 18 Relationship of subthemes for LT-Admin2.....	299
Figure 19 Relationship of subthemes for LT-Teach3.....	303
Figure 20 Relationship of subthemes for SV-Teach2.....	306
Figure 21 Relationship of subthemes for CA-Coord.	312
Figure 22 Relationship of subthemes for LT-Coord.....	322
Figure 23 Relationship of subthemes for LT-Teach6.....	327
Figure 24 Relationship between number of subthemes (with replication) and the number of thick responses.....	332
Figure 25 Relationship between average number of subthemes and the average number of thick responses.....	334
Figure 26 Subtheme profiles by strand.	348
Figure 27 Relationship of subthemes within the four views.	349
Figure 28 Seeds of views oscillating with the dynamic view.....	390

List of Acronyms

CA	Canada
DfES	Department for Education and Skills
EE	Environmental Education
EPI	Environmental Performance Index
ESD	Education for Sustainable Development
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GNP	Gross National Product
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
LT	Lithuania
OECD	Organisation for Economic Co-operation and Development
Ofsted	Office for Standards in Education, Children's Services and Skills
PAR	Participatory Action Research
SD	Sustainable Development
SV	Sweden
TDSB	Toronto District School Board
UN DESD	United Nations Decade of Education for Sustainable Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wildlife Fund

List of Appendices

Appendix A: Schedule of Interviews	474
Appendix B: Information Letter for Administrators.....	475
Appendix C: Information Letter for Colleagues	476
Appendix D: Consent Form for Participants	477
Appendix E: Background Questionnaire for Participants.....	478
Appendix F: Original English Interview Schedule	479
Appendix G: Original Lithuanian Interview Schedule	480
Appendix H: Alternate Interview Schedule for Canada and Sweden.....	481
Appendix I: Alternate Interview Schedule for Lithuania	482
Appendix J: Copy of Note of Gratitude for Lithuanian Participants	483
Appendix K: Interview Questions Covered on Site in Each Nation.....	484
Appendix L: Top Ten Interview Questions	487
Appendix M: Summary of Thin and Thick Responses to Questions 1–10.....	488
Appendix N: Raw Data of Précis Analysis in Each Nation.....	496
Appendix O: Summary of All Raw Data of Précis Analysis	499
Appendix P: Summary of Stage of Participants by School and Role	500
Appendix Q: Summary of Participants' Backgrounds by Nation and Stage	501
Appendix R: Number of Subthemes for Ten Interview Questions.....	502
Appendix S: Subthemes Data Tables for Ten Interview Questions	503
Appendix T: Combined Subthemes Data Tables	513
Appendix U: Selection of Responses for Coding	517
Appendix V: Vertical Analysis Data for Response Styles.....	519
Appendix W: Horizontal Analysis for 16 Portrait Participants	521
Appendix X: Analysis for Views	522
Appendix Y: Participant and Stage Trend Analysis	523
Appendix Z: Trends in Word Maps for Horizontal Analysis	524

Chapter 1:

Introduction

Prelude to the Study

The story that has become this thesis began for me in October 1999 as I was teaching secondary school science in London, England, and doing research in the British Library in the evenings. Encountering the website for the International Union for Conservation of Nature (IUCN) and their Commission on Education and Communication (CEC), I saw a phrase that was new to me: Education for Sustainable Development (ESD). I did not fully understand what it meant, yet I was immediately hooked by a sense of excitement in finding a realm that might speak to my own background interests in learning as a tool for change in individual lives as well as in the life of our planet. After the passage of what has been almost 14 years, the work of the IUCN CEC still speaks to me and provides links to the research I relate in this thesis. Another aspect that has changed little in the intervening years and is slightly more difficult to explain is that the problem I encountered in clarifying the meaning of ESD seems to be part of the landscape of this field.

The real beginning of the story of this thesis, however, is my dawning awareness of my bond with this Earth. In my very first memory, aged three, I am sitting on the soil of the garden in our backyard in Toronto in late spring with my attention transfixed by the bleeding heart flowers above my head, fascinated by their intricate shape and entranced by their lovely colour. As I grew up, I was lucky in being exposed to family properties in places of natural beauty, spending summers on the seashore of Cape Cod or by the lake in Muskoka, and visiting all year round the farm in the Mulmur Hills. Exposure to these special places continued through my formative years and into my early twenties. Both of my parents grew up in families that valued the natural world and camping, and my brother and I spent part of our own teenage summers at a

camp in Algonquin Park. My memories of experiences in natural environments are beyond counting and are linked to all my senses: the smell and taste of salty ocean air, the sound of wind moving through a tall pine wood, the gentle lapping of waves at a boathouse dock, the feel of pine needles or sand underfoot, and the relaxation of eye muscles as I lost myself in long, quintessentially Canadian views across lakes with shores too distant to be seen.

The first time I recall being exposed to the principles of ecology was on a summer marine biology course at the Hunstman Marine Science Centre in St. Andrews, New Brunswick, the summer after my third year as an undergraduate at the University of Toronto. The trio of professors associated with the university's zoology department had a magic touch, opening up the delights of the marine world to us in a rigorous yet humorous way, learning about winkles in the day and then convivially eating them together at night. The course content and delivery captured my attention: its mixture of learning, laughter and the outdoors has shaped my path since then, inspiring me not only to pursue an MSc in marine ecology but to develop an interest in alternative science education that would draw me to complete my teacher training in England and to bring day and overnight expeditions into my own classroom practice each year I have taught. Over time, I have found myself wondering how different the experience and effect of teaching and learning would be if time to learn about and be with the environment were not limited to the span of days, small segments of curriculum, or particular individuals within a school, and so I came increasingly to explore the world of whole-school sustainability efforts.

Earlier in the same summer of 1991 that included my St. Andrews course, I found myself writing a waste management publication for an environmental group in Toronto. I was aware of environmental problems at this point, but they resided for me in the realm of mild concern. In the evenings after work I met with a friend of mine and, armed with small magnets to separate the more valuable aluminum cans from the others, we collected bag after bag of cans by going through the bins around Toronto's downtown core near the SkyDome. Our plan was to collect a

ton of aluminum cans for resale to the depot, but we miscalculated the volume this would require for storage. We had to give up our dream of earning a wage while working for the environment when my friend's father put his foot down after seeing his backyard taken up with bags of old cans!

When I returned to Toronto in 2000 after six years in the UK and arranged for networking meetings with people working in various roles in business, government, academe and non-profit, I tried to gain a sense of the most significant environmental concern they each felt we would be facing within the coming five years. Almost every person provided answers that were on a local or national scale, but one individual with whom I chatted in a Toronto coffee shop had a different, truly global answer: climate change, he told me, was threatening the very life of the planet. Could he be serious? Later that year Thomas Homer-Dixon made the case, in his book *The Ingenuity Gap*, that the world at that time was facing problems that were on the verge of becoming so complex that they would exceed our capacity to devise solutions. My father gave me a copy of the book just weeks before September 11, 2001. The second chapter, "Our New World", outlines evidence from the Vostok Antarctic ice cores. In a figure significantly entitled "CO₂ Concentrations and Temperature Have Varied in Lockstep", the time scale extends 450,000 years before the present (Homer-Dixon, 2000, p. 64). The sight of this graph, with its final off-the-scale peak in present-day CO₂ concentrations, was sobering. Al Gore describes recognizing a similar type of graph, the Keeling curve, as "the image that first caused me to think about – and then to become intently focused on – global warming", as he later wrote in *An Inconvenient Truth* (Gore, 2006, p. 30; pp. 36–37). Homer-Dixon adds critical information about the links between carbon dioxide and temperature:

the projected level of atmospheric carbon dioxide shown in the illustration opposite rises almost vertically. Experts can't say for sure what effect this increase in carbon dioxide concentration will have on the planet's average temperature. But the Vostok ice cores suggest temperature will rise, and perhaps rise fast. And one thing is certain: with each incremental ton of carbon we emit

from our cars, our power plants, and logging operations, we are producing, inexorably, an atmosphere that is significantly different from the one that influenced human civilizations in the past (Homer-Dixon, 2000, p. 65).

By 2001 I was also aware of the results of the third report of the Intergovernmental Panel on Climate Change (IPCC), which provided further detailed evidence of human-induced climate change (www.ipcc.ch). I do not recall the precise timing of the shift in my thinking about environmental issues from mild concern to deep distress, but I do know that by December 2005 I recognized that the planet was certainly in peril due to climate change and that my ability to find solutions in the face of complex problems presenting on a global scale appeared woefully inconsequential. My coffee shop interlocutor whose answer had so surprised me just five years previously now seemed almost prophetic. Since that time, part of my own response has been to connect more deeply with nature and find means to foster hope and compassionate action.

In 2001 I embarked on my first graduate courses as well as additional qualification courses for Ontario teachers, with a focus on ESD and environmental studies, respectively. And so it was in the spring of 2001 that I was exposed to the importance of the economic sphere of ESD. Course readings included *The Global Citizen* by Donella Meadows, which included a chapter that initiated the unpacking of my own neoclassical economic beliefs at that time: “Unconventional Economics” (Meadows, 1991). If I had been asked before the onset of these courses, I might well have said that of the three spheres of environment, economy and society classically considered the components of ESD, my priorities lay in protecting and fostering a healthy environment. However, with the passage of time and the path I have travelled during the ensuing dozen years, I have come to see not only the importance of the economic sphere, but indeed the degree to which all three spheres are inextricably interwoven. I often find myself reflecting on a financial transaction and considering how to balance these three dimensions. Some purchases result in an easily determined balance, but others are more difficult or have impacts that are less obvious. My own commitment is to consider and balance these three

spheres, understanding the reality that by definition my life on this planet has an impact, since I both require resources and produce waste. I have come to appreciate that living in balanced awareness is a challenge.

A benefit of engaging with the additional qualification courses was that over the years from 2001 to 2004 during which I pursued my specialist certificate in environmental studies, I met a cohort of like-minded educators. A valuable central aspect of the courses was the quality of dialogue, with part of one day focused on best practices and success stories each of us could share that others might usefully implement at their own school. During this period I had also begun to attend relevant conferences for ESD practitioners, finding best practices highlighted here as well, which I sought to bring to my own teaching. My suitcase and notebook would be filled with new teaching tools, bits of curriculum, books, online leads and plenty of creative ideas. Towards the end of this period I met an American sustainability educator who described success stories from schools practicing ESD within the five boroughs of New York. Remarkable cases included schools that had come together to decide their sustainability needs, with one in particular campaigning for and succeeding in the removal of a neighbouring crack house. The range and in some cases the scope of these success stories were stunning.

I found myself mulling over the implications of this breadth of success stories when I was asked, early in 2006, to parse the difference between ESD and general “good educational practice”. Over time I found that one way to reconcile the differing scope of ESD found in those schools with a focus on their own ecological footprint reduction (particularly through energy and waste reduction) as compared with those schools changing the community around them (such as removing crack houses) was to consider the interface of the educators behind the programs with the conditions in which they found themselves. Considering the diversity of engagement that could find a home under the aegis of ESD’s three spheres, I found my interest shifting from product to process. By late 2006, when asked for the “best recipes of success” by another

educator, I realized that my own emphasis had shifted away from seeking recipes or best practices and towards the views of individual educators in shaping a liveable future.

Another aspect of my experience that has continued over time is a struggle with the language of ESD. It is rather strange to think that my response to seeing the term on the IUCN CEC's website almost 14 years ago, "Sounds great, but what does it mean?" is pretty close to my current thinking regarding the term, even though I have spent years as both a researcher and practitioner in the field. Terminology since then has proliferated (as for example education for sustainability, sustainability education, learning for sustainability), a process often accompanied by significant effort on the part of educators to define and delineate the territory of the terms. If asked to define ESD, I sometimes find myself wondering how to pitch the response, given the person with whom I am speaking. There are times that I yearn to have chosen a field of study in which I could deal with straightforwardly uncontroversial terminology such as, say, myocardial infarction, rather than feeling that whenever I confront my own field's language issues I am liable to experience one.

As illustrated in this Prelude, my own connection to and concern about the natural world have deepened over the years. I believe serious environmental issues are presently facing us on an unprecedented scale, yet I also believe that we have the time, ability and responsibility to take action through first shifting our thinking and sense of connection with a view to ameliorating the situation, not just for ourselves but for those disparate to us in both time and place. This thesis presents data collected from engaged schools; it is from the words of these participants that I developed a model of sustainability perspectives detected through six stages, as well as a system of four views which depict an individual's sustainability perspectives. The remainder of this chapter details the research focus and significance of my study.

Research Focus

This section details the research question, outlines the methodology used and discusses the case study selection regarding the manner in which the 30 participants came to be involved in this study. By way of introducing the discussion below of these topics, one significant point should perhaps be mentioned at the outset: all the participants are adults who have engaged in creating and maintaining the EcoSchools program in their schools. There were two formal ethical review processes required for this study: one through the University of Toronto and one through the Toronto District School Board (TDSB), with which all the Canadian schools in the study are associated. The result provided approval for working with adults aged 18 and over, and as a result, no students were included in the study. Nevertheless, the perspectives and experiences of students were never far from the core intentions of this thesis.

Research Question

The principal research question that this thesis investigates is as follows: *What are the qualities of the sustainability perspectives of adults engaged in a whole-school sustainability program?* To unpack this question: ‘sustainability perspective’ relates to an individual’s sense, awareness or interpretation of sustainability; ‘whole-school sustainability program’ means a program (for this study, the EcoSchools program; see later in this chapter for more information) that involves multistakeholder buy-in and whole-school participation in at least some of the activities (such as waste management and reducing energy consumption); ‘adults’ refers to members of the EcoSchool committee leading the program efforts, including administrators, teachers and caretakers, as well as their associated national coordinator, but excepting the student membership of the committee.

I chose to address my research question through an interview protocol with questions ranging from definition of terms to successes and challenges of program implementation and

goals that might go beyond the program's scope (see Appendices F through I). The primary data for this study were (mostly single) semistructured interviews, of an hour's duration on average, recorded in the spring of 2006 with 30 individuals in three nations, covering the roles of national EcoSchools coordinators, caretakers, teachers and administrators. The 30 participants included: 10 Canadians, the national coordinator plus two administrators and seven teachers from four schools; 14 Lithuanians, the national coordinator plus five administrators, seven teachers and one caretaker from four schools; and six Swedes, the national coordinator plus two administrators, two teachers and one caretaker from two schools. I also collected background information from the participants via a single-page questionnaire (see Appendix E).

An individual's sustainability framework is a guide in shaping a liveable future on this planet; it is in evidence in the manner in which individuals connect with, think about, and engage in sustainability issues. Investigating the research question allowed an exploration of ways to detect and depict participants' perspectives regarding sustainability, as well as what I term their individual sustainability framework: cognitive and affective aspects that shape and inform the perspectives available to them. The four phases of analysis described in Chapter 4 and outlined in the results chapters of this thesis (Chapters 5 through 8) describe the manner in which I was able to capture a sense of these perspectives, at first detecting them through a six-stage model and then depicting them through four distinguishable views. This model and the views are key substantive insights from this thesis, as described in a later section.

Abstract of Methodology

A primary intention throughout the research exploring this question is to use methods that would most effectively reveal meaning from the data. In many cases the methods used are to be found in mainstream qualitative research; at other points, methods were designed for this study, as outlined in detail in the methodology section of Chapter 4. Huberman and Miles provide

useful guidance regarding the methods involved in qualitative data analysis. They suggest it “call[s] for creative work. In effect, qualitative designs are not copyable, off-the-shelf patterns, but normally have to be custom-built, revised, and ‘choreographed’” (Huberman & Miles, 1994, p. 431). As a consequence of the principal research question being juxtaposed with an interest in innovative methodology, a number of methodological developments (to be detailed in Chapter 4) took place during the course of the study. These methodological innovations constitute a significant feature of the study, and as such are briefly discussed, along with substantive insights from the results, in the section “Significance of the study” later in this chapter. This section outlines the methodology supporting the study, beginning with the piloting of the interview protocol and proceeding through data collection and four phases of analysis.

Pilot study

My process began by formulating questions for participant interviews and piloting these at a private-sector secondary school in Toronto. The choice of a private school was dictated by the fact that, at that time, I had a pool of only five EcoSchools in the TDSB, which were to be reserved for the study proper. The advantages and limitations of this choice are described in Chapter 4.

Site visits and interviews

For the study itself, almost all of the participants were interviewed only once, whenever possible individually but often in groups of two or more, due to limitations of time (see Appendix A for the schedule of interviews). At many of the schools I was afforded the opportunity to tour the site briefly, while being introduced orally to the school’s EcoSchools initiatives and in some cases viewing displays of students’ sustainability-related work and other relevant documents. However, documentation was difficult to obtain with any consistency

across the schools, and so for the purposes of the analysis I focused on the interviews as key primary data.

Methodology of analytic phases

The four phases of analysis undertaken in this study may be broken down in methodological terms as follows. In Phase 1, I collected and then transcribed the interview data, coding the responses in broad terms that allowed me to begin identifying patterns. Phase 2 centred on the creation of précis documents (two-metre lengths of ticker tape, one per participant, incorporating summaries of that participant's responses) that allowed me to determine two broad styles of response and to begin to identify a more subtle pattern in the data via gap analysis. In Phase 3, I further developed the response pattern by differentiating the ten most popular questions into three strands, then using the response style analysis from Phase 2 to generate a stage model of sustainability perspectives, the first key outcome of the study. Finally, Phase 4 involved further coding by 28 subthemes, word count analysis of these subthemes using two-way respondent-by-word matrices, and word maps to develop 'portraits' of approximately half of the participants. The techniques of this phase of analysis led to the study's other key outcome, the portfolio of participants' views.

Case Selection

For my doctorate, I have engaged in two collaborative programs within the University of Toronto: between the Ontario Institute for Studies in Education (OISE) and the School of the Environment, as well as within OISE's Comparative International and Development Education Centre (CIDECE). These programs would drive not only my doctoral course selection, but also my thesis project. The project would need to look at a style of education that touched on the environment in an international context. With curricula varying so widely, my choices would probably relate either to co-curricular options or to international certification schemes that two or

more nations engaged in. The following sections describe the choice of EcoSchools as the case study program, and the nations of Canada, Lithuania, and Sweden as the context in which the 30 participants in this study were living.

Why the EcoSchools program?

Working as a secondary school science teacher in Ontario, I knew of the TDSB EcoSchools program and had discussed its functional qualities with a number of the colleagues I met while training for my teacher's specialist in environmental science. The fact that the International EcoSchools program involved a wide variety of nations (38 were listed at the time of the research proposal on the Foundation for Environmental Education [FEE] EcoSchools website) that followed a program with many common characteristics made EcoSchools of interest as the case study program. A comparison of the EcoSchools program (<http://www.eco-schools.org/>; <http://ecoschools.tdsb.on.ca/>) found in the Toronto schools with those overseas at the time of data collection in 2006 is shown in the following table:

Table 1

Comparison of Canadian and International EcoSchools Projects in 2006

	TDSB EcoSchools (Canadian)	FEE EcoSchools (International)
Process	<ol style="list-style-type: none"> 1. Establish an EcoTeam 2. Assess the school's needs 3. Identify priorities; develop an action plan 4. Implement the action plan 5. Monitor and evaluate process 	<ol style="list-style-type: none"> 1. Establish the EcoSchool committee 2. Conduct environmental review 3. Create action plan 4. Monitor and evaluate 5. Engage in curriculum work 6. Inform and involve 7. Create Eco-code
Certification	Gold, silver or bronze standard	Green flag

Although the programs are broadly similar, the table above shows that certification was handled in different ways. For instance, schools in Lithuania and Sweden worked to attain the green flag, whereas the Toronto schools worked through stages towards the gold standard. Further, an

environmental review or audit is required in the international version of the program, with an explicit statement of engaging in curriculum work which may itself require changes.

In her master's thesis, Suzy Simonetti investigated environmental values, generating quantitative data by using the *New Ecological Paradigm* scale with Toronto students in primary school (Grades 4 and 5) EcoSchools and non-EcoSchools (Simonetti, 2007, p. 38). She contextualized the TDSB EcoSchools program by comparing the international and Toronto styles in this way: "Unlike the European EcoSchools program ... the TDSB wanted to appeal to the average school: converting mainstream schools into opportunities for students to learn ecological literacy while improving operational practices" (Simonetti, 2007, p. 6). However, even though the teams coordinating the Toronto and Ontario EcoSchools programs have created curriculum documents for use in schools (Ontario EcoSchools, 2012a, 2012b; TDSB, 2004a, 2005, 2007, 2012, n.d. a), there was at this time no explicit connection to curriculum in the program certification, making curriculum engagement a significant difference in the operationalization of this program in the two styles of EcoSchools shaped in Canada and abroad. A number of changes have been implemented in the programs since the time of the thesis proposal, including a platinum standard that has been created for the Toronto schools and the integration of ecological literacy into certification. However, the changes are not developed here, as they are not relevant to the state of the programs at the time of the data collection.

Why these participants from these three nations?

At the outset of the design phase of this study, I had initially considered interviewing only teachers at each of the EcoSchools involved. As I discussed my study design notions with various colleagues, seeking improvements, I then decided to interview both teachers and program coordinators. However, one of these colleagues, an educator who had worked as a board of education superintendent, reminded me to include the complete range of voices: not just program coordinators and teachers, but also the caretakers and the administrators. As an

EcoSchools committee involves a range of adult voices, an interesting approach would be to include them, as described in a later section in Chapter 4. Each nation's program coordinator agreed to be interviewed, and at each of the ten schools available to me for this research, administrators, caretakers, and any teachers involved in the program were invited to participate in the research. As it happened, not all of these individuals were available at every school, with the result that only two out of the ten schools visited (LT-1 and SV-1) included interviews with individuals in all three roles of caretaker, teacher and administrator. Even so, the data for this study does include voices among the 30 participants from the four job roles of program coordinator, administrator, caretaker and teacher. A noteworthy feature of this study is its use of this complete range of voices; this was also instrumental in the development of the primary outcomes of the model and views of participants.

The following figure presents a map (using a Mercator projection, which preserves angle but not area; WorldAtlas.com, n.d.) as well as four key measures regarding each of the three nations visited in this study. The metrics are GDP per capita (www.imf.org); the Environmental Performance Index (EPI), a sustainability measure determined in a joint project between Yale University and Columbia University to "rank countries on 22 performance indicators spanning ten policy categories reflecting facets of both environmental public health and ecosystem vitality" (Emerson et al., 2012, p. 7); population (<http://www.statcan.gc.ca>; <http://www.stat.gov.lt/en/>; <http://www.scb.se>); and the Economist Intelligence Unit's Where-to-be-born (WtbB) index, a future-oriented quality-of-life measure that "links the results of subjective life-satisfaction surveys ... to objective determinants of the quality of life across countries" to answer the question "Which country will be the best for a baby born in 2013?" (Kekik, 2012, p. 91). This last index is included for its relevance to the experience of learning in the three nations.

Figure 1. Metrics regarding Canada, Lithuania and Sweden.

The map above indicates the relative geographic proximity of the two Baltic nations of Sweden and Lithuania, contrasting with the disparity between them regarding the four metrics. While their EPI indices are relatively similar (ranking 9th and 17th, respectively), their WtbB index is quite different (ranking 4th and 57th, respectively). Of the three nations, Lithuania has the smallest population at 3.18 M, or about one third of that of Sweden, one tenth of that of Canada, or not much larger than the population of 2.62 M of the City of Toronto in 2011 (Statistics Canada, n.d.). GDP per capita is very similar for Sweden and Canada (ranking 8th and 9th, respectively), yet GDP per capita for Lithuania is much smaller, yielding a rank of 52nd. While the choice of nation was part of the study's design at the outset, comparative considerations became less emphasized over the course of the study, as described in Chapter 4, so that it may be described as an internationally located study affording opportunities for comparison. What

Figure 1 indicates is that the context that the 30 participants in this study find themselves in does

vary, and some points of comparison are made by nation in the results section (see the Comparative Summary of Findings in Chapter 7).

Significance of the Study

This thesis emerges from the context of standard sustainability learning issues regarding the spheres of the environment and economy (see Chapter 2) and of education (issues unpacked in Chapter 3), and moves towards a deeper conception of drivers and barriers to sustainability learning (see the results of the study, Chapters 5–8) as detected through an individual's sustainability framework. This section outlines both substantive insights and methodological innovations that arise in this thesis. It may be used as an organizing aid by the reader since some of these points take a number of chapters to develop fully, appearing through the results section of the thesis, Chapters 5–8, as well as the concluding Chapter 9.

Substantive Insights

The primary data for this thesis, thoughts and words expressed by 30 participants associated with the EcoSchools program in three nations, were shared in formal interviews in the spring of 2006. The successive phases of analysis provided two substantive insights regarding the outcomes of this study: a six-stage model and four holistic views of participants. In the analytical process involved in determining these study outcomes, the voices of the participants themselves revealed findings of substantive insight regarding the program and the people; I refer to the latter as qualities of the sustainability chef.

In framing the outcomes of the study, it will be helpful to introduce some of the language used. A sustainability framework refers to the cognitive-affective capacities an individual brings to sustainability and sustainability learning; this framework is personal and is developed to different degrees in different individuals. A sustainability perspective refers to the sense or awareness of sustainability that an individual experiences through the medium of their

sustainability framework. While it may not be obvious in principle that any pattern would emerge from considering the frameworks and perspectives of 30 participants of a study conducted in three different nations, analysis of the interview data did reveal a consistent pattern that is expressed in terms of the study outcomes: model and views.

The model of sustainability perspectives outlines a trend of response in the data set moving from all ‘thin’ responses (Stage 1) to all ‘thick’ responses (Stage 6) to the interview questions, grouped in three strands of connection, interpretation, and engagement questions (a full account of the specific terminology employed in this study can be found in Table 4, Chapter 5). The determination of response style involves noting which and how many different subthemes a participant touches on and is a methodological development, described briefly below and in greater detail in Chapter 4 as a reflection of work by Gilbert Ryle (1968/1971) and Clifford Geertz (1973/1975). This model acts as a way of detecting an individual’s sustainability framework, in the following way: each stage is a description of the level of development of the framework, along what the data show to be a unique path through the three strands. This path is consistent with what I term the action equation, which will be presented in the context of Chapter 3. The model is described in Chapter 5 and then used as a basis to portray the participants’ responses in two different ways: the vertical analysis of Chapter 6 shows a selection of thin and thick responses to each of the top 10 interview questions (one or more responses from all 30 participants are included); the horizontal analysis of Chapter 7 provides stage portraits based on responses in the three question strands (involving a representative cohort of 16 participants).

The four views exhibited by participants (long, wide, deep and dynamic views) unpack the manner in which participants make use of the most frequently touched on subthemes in their responses, with a sustainability perspective representing some combination of views. Chapter 8 describes each of the views separately and together, as seen in participants’ responses as well as in literature of the field. The views may be seen as a means of depicting, via the perspectives

available to an individual, that individual's sustainability framework, which is emerging to different degrees in the initial stages of the model, but fully realized by Stage 6. An illustration suggesting how the views might interact is proposed, showing the views in bidirectional feedback between the seeds of each of the long, wide, deep and dynamic views and a greater sense of individual sovereignty, as individuals work with their unique conditions and engage in shaping a liveable future.

Throughout Chapters 5 through 8, what can be heard in the voices of the participants themselves are insights regarding sustainability program success factors and the people who engage with whole-school sustainability learning projects such as the EcoSchools program. These insights are then drawn together in summary form in the conclusion, Chapter 9. These summaries are not meant to be taken as exhaustive by any means, but rather a reflection of the depth and breadth of insight these educators shared regarding their own experience.

Significant Methodological Innovations

As a response to the challenges presented by the study data, a number of methodological innovations were developed, which form an additional facet of the study's significance: précis documents, designation of response style, word counts and two-way matrices, as well as word maps. These and other aspects of the methodology are detailed in Chapter 4 and associated appendices. Each development had as a starting point others' work, but evolved to suit the unique requirements of data analysis for this investigation. For instance, the designation of style of response sprang from work by Ryle (1968/1971) and Geertz (1973/1975); word count analysis and two-way respondent-by-word matrices are an evolution of techniques described by Bernard and Ryan (2010); word maps were developed from the type of diagrams proposed by Venn (1880). Together, these methodological developments reflect a guiding principle of Miles and Huberman: "Be open to invention" (Miles & Huberman, 1994, p. 310).

Organization of the Thesis

The rest of this thesis is divided into eight further chapters. The next two chapters frame the context within which the thesis is situated, their general organization reflecting the standard notion that sustainable development involves three spheres of the environment, economy and society. Throughout this thesis, the sphere of society is considered largely in terms of the process of learning which shapes our society, found within and beyond learning organizations. The wider issues at play in the social sphere of sustainable development, including social justice issues, run beyond the remit of this thesis. Chapter 2 outlines a discussion regarding the spheres of the environment and economy, portraying contemporary understanding of the condition of the environment and the choices available to us within the economy that impact on it. Chapter 3 first contextualizes and unpacks relevant processes to sustainability learning, which include a sense of wonder, a style of thinking, and a quality of engagement, before outlining examples of schools in the United States and the United Kingdom that have set in place learning for shaping a liveable future. Chapter 4 outlines and discusses the methods used for data collection, handling and interpretation, and is followed by four chapters of results and analysis regarding the data.

The outcomes and findings of this investigation are outlined in Chapters 5 through 8. Chapter 5 provides an overview of the general results leading up to the six-stage empirical model of sustainability perspectives. Chapter 6 uses this model to provide a vertical analysis across ten questions for the participants' responses. Chapter 7 provides a horizontal analysis, considering portraits of the characteristics of participants' responses by stage for Stages 2 through 6. Chapter 8, a form of meta-analysis of the participants' responses suggested by reflecting on the nature of sustainability perspectives, details four characteristic views – long, wide, deep and dynamic – set in context from the literature. Chapter 9, the final chapter, summarizes the outcomes, findings and methodological developments of the study and discusses its limitations along with its significance, its implications, and future directions that may arise from it. A key outcome of the

thesis is that environmental action is preceded not just by appropriate knowledge or thinking, but most significantly by a sense of connection *to* (the environment) and connection *with* (concepts), which shapes a living responsiveness to conditions that arise rather than dictating particular actions to be taken.

Chapter 2:

Charting the Context for a Liveable Future Through Environment and Economy

Introduction

A key challenge facing any environmental educator is to overcome a strong societal paradigmatic bias in which our planet's resources are simply there to be exploited, with little credence given to environmental and, to an increasing extent, economic consequences. As detailed in the results chapters of this thesis, virtually all the study participants expressed this as a central concern. David Orr, in his 2007 article "Optimism and Hope in a Hotter Time", highlights the fact that we often cling to a distorted view: "People, and particularly students, cannot handle much truth" (Orr, 2007, p. 1393). We are given messages that can be fundamentally at odds with each other:

We are told to buy hybrid cars, but are not asked to walk, travel by bikes, or go less often, even at the end of the era of cheap oil. We are asked to buy compact fluorescent light bulbs, but not to turn off our electronic stuff or not buy it in the first place. We are admonished to buy green, but seldom asked to buy less or repair what we already have or just make do.... We are not told that the consumer way of life will have to be rethought and redesigned to exist within the limits of natural systems and better fitted to our human limitations (Orr, 2007, p. 1393).

Orr shares the quandary of knowing about the need for action, yet not necessarily following through with actions that are in alignment with that knowledge. He says,

Telling the truth means summoning people to a higher vision than that of the affluent consumer society. Consider the well-studied but little-noted gap between the stagnant or falling trend line of happiness [in America] in the last half century and that of rising gross national product. That gap ought to have reinforced the ancient message that, beyond some point, more is not better. If we fail to see a vision of a livable decent future beyond the consumer society, we will never summon the courage, imagination, or wit to do the obvious things to create something better than what is in prospect (Orr, 2007, p. 1395).

In many ways, if the depth and breadth of difficulties that are brought about by the lifestyle and dream of the affluent consumer society are truly understood, then we would not in any way seek to perpetuate it. This is what Wilfred Owen referred to as "The old Lie" told to children, in his

poem “Dulce et Decorum Est”, in a different but arguably parallel context. Owen’s words, condemning not simply war itself but more crucially the uninformed attitudes that lead to it, find a resonance with unsustainable aspects of 21st-century consumption.

If you could hear...
My friend, you would not tell with such high zest
To children ardent for some desperate glory,
The old Lie.... (Owen, 1918/1994, p. 29).

What ought environmental educators be telling the students in their care? This question is one with which many of the participants in this study have wrestled, as too have others such as those Ontario teachers surveyed and interviewed by Tan and Pedretti (2010). On one level, educators face the dilemma of whether on the one hand to allow students to draw their own conclusions, even if those conclusions perpetuate climate-change denial or fatalism, or on the other hand to direct students towards values commensurate with planetary threat. As Tan and Pedretti put it in their recent study of Ontario teachers,

Though [three quoted] teachers use the term *indoctrination* fairly loosely and in a semi-humorous fashion, we could not help but discern a certain sense of finality.... Are they suggesting, for instance, that the need to recycle, conserve energy, and reduce personal consumption is not up for contention, and that they perceived their task as converting students to their cause? Though we do not disagree with the fundamental intent behind many of these attempts at modifying students’ values, we worry about the distinction between indoctrination and education ... and how that plays out in classrooms (Tan & Pedretti, 2010, p. 69).

One resolution of this dilemma is to focus on fostering citizenship as a key goal of formal education. Yet, on another level, debate has emerged in the Canadian science education community (see for example Alsop & Bencze, 2010, 2012; Burns & Norris, 2012) around whether even this less ‘directive’ approach implies a change in assumptions regarding what education is for: preparing students to be productive members of the workforce, fully engaged citizens or even environmental activists? Debate has arisen around what these options imply about the aspect of ESD pertaining to values, with some concern that avoidance of such

questions may leave the field to those who would perpetuate the socioeconomic status quo, with assumptions less than fully examined.

Uncovering uninformed attitudes begins the movement towards achieving environmental solutions through an awareness of the conflict between wishful fantasy and reality. All too often, however, finding appropriate action remains perplexingly elusive from a starting point of certain thinking patterns or states of mind. ESD's three spheres of environment, economy and society offer a powerful framework for overcoming these patterns, one that many environmental educators, including a number of the participants in the present study, have found valuable.

Contextualizing ESD's Three Spheres

Since time immemorial, human societies and economies have been a part of the environment, relying on it as well as having an impact on it through resource use or waste production. For most of its history, the Earth seemed big enough that it would have the capacity to rejuvenate or provide unsullied havens for generations to come. Yet the Industrial Revolution brought about changes to the landscape, the economy and the society, an image of which William Blake so vividly captured 200 years ago in his poem which was the preface to *Milton*, through reference to "these dark Satanic Mills" (Blake, 1808/1978). Blake's poem was put to music about 100 years ago and over the course of the last century it has been sung as a popular anthem, "Jerusalem", reminding us of a perhaps mythical time lost, one that included "England's green & pleasant Land" (Blake, 1808/1978).

Although the Industrial Revolution had far-reaching effects, the imagery of Blake's poem relates to point-source pollution from factories. It was 160 years later that a giant leap was made from this mode of observation towards one where the entire planet could be considered as an entity itself. On Christmas Eve, 1968, the crew of Apollo 8 captured an image of our planet that has since become known as "Earthrise". It was the first time that an image of Earth in its entirety

was available, showing its characteristic blue colour with swirling white. The fragile nature and solitary situation of our home were clear. The race to space that President Kennedy ignited in the early 1960s had succeeded in terms of expanding the common consciousness. Whether through Buckminster Fuller's *Operating Manual for Spaceship Earth* (1969) or a decade later with James Lovelock's *Gaia* (1979), dialogue had emerged regarding how we might survive, as an astronaut does with limited space and finite resources, or what lessons we might learn otherwise. Donella Meadows made a similar point in one of her final articles, "Just So Much and No More" (Meadows, 2001), while Austrian-born American physicist and philosopher Fritjof Capra has stated along the same lines that

One of the most difficult things for people in our culture to understand is the fact that if you do something that is good, then more of the same will not necessarily be better. This, to me, is the essence of ecological thinking (Capra, 1982, p. 41).

One key aspect to the shift that had taken place is that the planet as a system and the influence of systems thinking was being brought to bear on what had previously been a more two-dimensional approach to conservation.

The organization of this chapter around the headings of environment and economy, along with the focus of Chapter 3 on education as a core societal subset, stems from the three dimensions of sustainable development that were the focus of the Brundtland Commission's report, *Our Common Future* (1987), a document that maintains a strong influence. Both of this chapter's major sections take as an organizing principle sustainable development, which the Commission, formally known as the World Commission on Environment and Development (WCED), defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43). The concept of the three pillars or spheres of sustainable development is still in common use almost a quarter of a century after the Commission's report, as shown in a recent *OECD Insights* document, *Sustainable Development: Linking economy, society, environment* (Strange & Bayley, 2008).

Significantly, of the various issues considered central to the concept of human development, the United Nations Development Programme (UNDP) features sustainability “for future generations in ecological, economic and social terms” prominently on its human development web page (UNDP, n.d.) as well as in the UNDP’s 20th anniversary edition of the Human Development Report (HDR), *The Real Wealth of Nations* (UNDP, 2010).

Although the Brundtland Commission’s manner of considering sustainable development continues in contemporary dialogue, the influence of a more holistic perspective, the acknowledgement of interconnections, and the power of solutions on both the individual and systems levels have emerged and will be recounted in the balance of this chapter, as well as closely informing subsequent chapters. It is fair to say that “sustainable development” has become, and remains, a fulcrum term, seen by some as progressive in its focus on human welfare and by others as retrograde in its perceived subordination of the environment to such welfare. Arguably, “sustainability” has gained favour at least in part because it sidesteps the anthropocentric implications of the word “development”. Researchers have explored the problems associated with the language of sustainable development and ESD, as illustrated in the section dedicated to language and meaning in *Key Issues in Sustainable Development and Learning: A Critical Review* (Scott & Gough, 2004). Here, excerpts of previously published work (Sachs, 1991; Stables, 2001a; see also Stables, 1996, 2001b) are juxtaposed with fresh vignettes, such as “The Contact Zone: Whose Nature? Whose Sustainability?” (Soetaert & Mottart, 2004) to uncover the nuanced problems of language in this field.

In terms of the present study, the aim of this chapter is to establish the environmental and economic context for the ways in which I have understood and sought answers to the research question: *What are the qualities of the sustainability perspectives of adults engaged in a whole-school sustainability program?* Such a context must necessarily be broad enough to reflect, at least to some extent, the wide sweep of interconnecting factors that ultimately have a role in

informing an engaged individual's sustainability perspective. Indeed, the responses garnered in the interviews that provided the study's body of raw data touched frequently on wider economic and environmental perspectives, whether outlining the desire to see graduated students become part of a transformation of national society or simply pointing out the discrepancy of teachers arriving each morning at an explicitly environmentally oriented school in SUV's. Thus an overview of such factors is a key part of the study's setting.

Environment

What informs the choice to begin a literature review for a doctoral thesis on ESD with a section on the environment rather than one on education? To answer this question in personal terms: fundamentally, my scientific training has led me to the understanding that on a molecular level all living things are made up of the same elements as their non-living surroundings, and will incorporate both the wanted essentials as well as pollutants during the course of life by a variety of means. David Suzuki has been making the point that we *are* the environment over a long period of time, most recently in his book *The Legacy* (2010). In this view, we are both influenced by and an integral part of the environment, so that a sense of separation from the environment is ultimately an illusion. Unwanted chemicals disposed of will eventually be assimilated by or impact on life forms; there is no "away" in which to dispose of them: a point vividly made by British poet Philip Larkin in his poem *Going, Going*, which was in fact commissioned by the UK Department of the Environment in 1972:

Things are tougher than we are, just
As earth will always respond,
However we muck it about;
Chuck filth in the sea, if you must:
The tides will be clean beyond.
—But what do I feel now? Doubt?
...

And that will be England gone,
The shadows, the meadows, the lanes,
The guild halls, the carved choirs.

There'll be books; it'll linger on
In galleries; but all that remains
For us will be concrete and tyres.

Most things are never meant.
This won't be, most likely: but greeds
And garbage are too thick-strewn
To be swept up now, or invent
Excuses that make them all needs.
I just think it will happen, soon (Larkin, 1974, pp. 21-22).

Larkin's pessimism perhaps reflects the end of a turbulent post-war period during which environmental concerns found relatively little place in cultural thinking; in retrospect one can see, with the commissioning of this poem as one minor symptom, that England around 1970 was in the process of beginning to wake up from a long period of profound cultural disconnection from the environment. This shift is reflected in a series of conferences organized under the heading *The Countryside in 1970*, including the Conference on Education held at the University of Keele, 26–28 March, 1965, at which Keith Wheeler (1975, p. 8) suggests that the first working definition in the UK of environmental education was shaped.

Many would say that the most serious and pervasive issue of our own time would be climate change and its link to greenhouse gas (GHG) emissions. Others, perhaps influenced by economic interests or perspectives, may not hold this view. There are climate-change skeptics who either deny or downplay the seriousness of the situation. However, given the variety of independent evidence from international organizations confirming the extent of human impact on the natural world and the result of those effects on humans and other life forms, the number of such skeptics is moderate in comparison to those who do advocate confronting the issue of climate change with all possible seriousness.

Still others' main focus is on the suffering brought about in the social realm of sustainable development, sometimes without seeing that the upstream causes might lie in the sphere of the environment and its degradation. A philanthropist friend of mine shared with me

that his family's foundation had to transfer their support of Médecins Sans Frontières (MSF) in one African nation to another due to the death of some of the MSF staff in the more volatile nation. He described to me the family's investment in high-calorie, nutrient-packed food supplements and the positive impact on the lives of the local people. I asked whether he would consider shifting the foundation's focus towards the environmental sphere rather than maintaining it on the social sphere of sustainable development. He expressed his view of this idea succinctly: "fuck the environment". At this stage, I believed that knowledge was a cornerstone in supporting individuals' choices with respect to the environment, so I shared Homer-Dixon's argument from *Environment, Scarcity, and Violence* (1999). This may have helped to show that 'upstream' from the MSF staff deaths and violent unrest is a degraded environment so that without rehabilitating nature, the situation was unlikely to improve to any significant extent. The point was used to illustrate that the environment is the most fundamental aspect of the complex picture of sustainable development. Understanding the state of the environment and problems faced globally has a logical place at the forefront of interest, preceding the other dimensions. The importance of seeing the connections from a problem that lead far upstream to the origins of that problem is a key factor in determining appropriate solutions that may last into the future, rather than shifting symptoms in the present. This perspective links to findings presented in Chapter 6 regarding themes of interconnections, action and time, as well as to the long view presented in Chapter 8.

Emergence of Wider Perspectives

The 20th century saw destruction of individuals and the environment on an unprecedented scale. Before the century was half over, there had been two World Wars and the detonation of two nuclear bombs. Chemicals synthesized to improve conditions at the outbreak of World War II, such as the insecticide DDT, had long-range and far-reaching effects. At the

midpoint of the century, a shift in the conservation movement arose, with the publication of Aldo Leopold's *Sand County Almanac* (1949/1969). Here he outlined a land ethic, one of increased connection and responsibility between individuals and the land they inhabit. Some point to the publication of Rachel Carson's *Silent Spring* (1962/2002), with its clarification of the scale and longevity of DDT's impact on the environment, as the beginning of the modern environmental movement.

In the last third of the century, the problems of population, energy provision and means of resource use appeared dominant. The Club of Rome began in 1968 and commissioned what was to appear, for the first time in 1972, as *Limits to Growth (LTG)* (Meadows et al., 1972), with another publication, *Beyond the Limits (BTL)* two decades later (D.H. Meadows, D.L. Meadows & Randers, 1992), followed by the most recent publication of *Limits to Growth: The 30-Year Update* (Meadows et al., 2004). 1972 also saw the first major conference on international environmental issues, the United Nations Conference on the Human Environment, also known as the Stockholm Conference. The day the conference opened, 5 June, was designated as World Environment Day and remains an international annual environmental event (UNEP, n.d.). On 15 December, 1972, the UN General Assembly followed up the conference with resolution 2994.

They noted

5 June as World Environment Day and [the General Assembly] urges Governments and the organizations in the United Nations system to undertake on that day every year world-wide activities reaffirming their concern for the preservation and enhancement of the environment, with a view to deepening environmental awareness and to pursuing the determination expressed at the Conference (UN, 1972).

By this time, Stanford professor Paul Ehrlich had published his *Population Bomb* (1968) as well as his paper with John Holdren, a former Stanford doctoral student, "Impact of Population Growth" (1971). Just after the appearance of *Limits to Growth*, Canadian Buzz Holling's paper was published, launching the concept of resilience into the academy with

“Resilience and Stability of Ecological Systems” (Holling, 1973). The editorial board of *Ecological Economics*, the journal of the International Society for Ecological Economics, ranks Holling’s paper second on the list of nominated influential papers; it is also listed within the top two dozen most cited journal articles in *Ecological Economics* (Costanza, Stern, Fisher, He & Ma, 2004). In many ways, Holling presents resilience and sustainability as counterpoints to each other, where the long-term sustainability of a system ultimately depends on its resilience in the face of short- to medium-term stresses. In fact, resilience is sustainability unpacked.

The paper ends with a note regarding applications of resilience. As Holling describes it:

A management approach based on resilience ... would emphasize the need to keep options open, the need to view events in a regional rather than a local context, and the need to emphasize heterogeneity. Flowing from this would be not the presumption of sufficient knowledge, but the recognition of our ignorance; not the assumption that future events are expected, but that they will be unexpected. The resilience framework can accommodate this shift of perspective, for it does not require a precise capacity to predict the future, but only a qualitative capacity to devise systems that can absorb and accommodate future events in whatever unexpected form they may take (Holling, 1973, p. 21).

The focus on process rather than product, and the recommended shift from local to regional context, are relevant to the outcomes and findings of this thesis and will be explored further in the discussion of thesis results along with their meta-analysis of long, wide, deep and dynamic views. Holling’s paper remains current in dialogues within the fields of ecology, ecological economics, environmental education and systems theory (Folke et al., 2002; Gunderson & Holling, 2002; Holling & Walker, 2003; Krasny & Tidball, 2009; Scheffer, Carpenter, Foley, Folke & Walker, 2001). Holling’s work on resilience complements that of Fritjof Capra on emergence and of Michael Stone on sustainability, which will be discussed in later sections. In essence, the three terms of emergence, resilience and sustainability relate to each other as descriptions of the type and, perhaps more importantly, organization of energy that arises in a system, and awareness of their fluid interactions is important for those interested in shaping a liveable future. To be slightly more precise, one may say that sustainability, in the moment of

genesis or adaptation, is at the core of emergence, determining which new patterns will persist; while the emergent character of a system inevitably shapes and informs its resilience.

Deemed a marginally more influential paper than Holling's yet contemporary to his, Garrett Hardin's 1968 article "The Tragedy of the Commons" was ranked by the editorial board of *Ecological Economics* as the most influential paper in the field; the board also noted that it is the fifth most cited journal article in *Ecological Economics* (Costanza et al., 2004). As of the spring of 2011, "The Tragedy of the Commons" ranks as most cited article in the journal *Science*. The central thesis of the article relates to the assertion that the population problem has no technological solution, where "A technical solution may be defined as one that requires a change only in the techniques of the natural sciences, demanding little or nothing in the way of change in human values or ideas of morality" (Hardin, 1968, p. 1243). Although an important point, this is not a new revelation. Almost 200 years before, Malthus illuminated the deadly consequences of a population growing at a geometric rate, outstripping the food sources on which it is reliant, and which increase at a merely arithmetic rate on a finite planet (Malthus, 1798/2008). The aspect of Hardin's thesis sometimes disputed is that the application of technological innovation to food resources may increase their production beyond the arithmetic-rate restriction, yet have associated with it heavy environmental costs (Brown, Gardner & Halweil, 1998, pp. 14-15). The troubling import of this is that we are really starving our planet, rather than ourselves directly.

In the context of the population problem, Hardin uses as an illustration the dilemma faced by an individual making a choice to put an extra cow to graze on a common pasture and suggests that the result of deliberation will be exactly opposite to that proposed by Adam Smith in his *Wealth of Nations* (1776/1930). The influence of an "invisible hand" will not lead this individual towards choices that will bring about the good for the many; rather, an inevitable tragedy ensues in moving beyond the carrying capacity of the commons, as the individual will choose to benefit

by the additional cow while suffering only a share of the disadvantage through the overgrazed, degraded commons. The example of the carrying capacity of a grazing pasture is a relatively simple one compared to the more complex and dynamic concept of human populations and the carrying capacity of this planet (Meadows et al., 2004, p. 303). In both cases, there are limits and when they have been exceeded, as Hardin suggests, the uncomfortable conclusion is that the only solution available, if not one of technology, is one in the realm of the conscience, one of values and of education. Such solutions are not readily adopted, as they require coordinated cooperative effort and may well be beyond any given individual's reach. As will be suggested, particularly in Chapters 3 and 8, this may well require a fundamental shift in thinking.

Hardin ends the article with the statement that “education can counteract the natural tendency to do the wrong thing” (Hardin, 1968, p. 1245). In an echo of Hardin nearly 40 years later, former U.S. Vice President Al Gore proposed that the issue of global warming as outlined in *An Inconvenient Truth* is one of moral imperative (Gore, 2006). What do we do when faced with an uncomfortable truth in an inexorably developing situation? How is an effective influence made to change behaviour? It was in the context of this activity in Hardin's academic milieu and beyond at the end of the 1960s that the first international definition of environmental education emerged, in 1970, at the joint IUCN/UNESCO meeting in Nevada (IUCN, 1970).

Limits to Growth: Sustainability vs Overshoot

When *LTG* first appeared four decades ago, it was unique in its manner of using mathematical equations of global time series data to constitute a computer model, providing substance to the debate and implications regarding the finite nature of our planet. The prediction was that growth of population and economy would cause the sudden and uncontrolled decline of both at some point in the 21st century. The World3 computer model developed and used in the original *LTG* was revised for the 20-year update *BTL*, as well as for *The 30-Year Update*. The

first two editions, though presenting a grave state of reality, were optimistic regarding the possibilities of the future. The third edition is more frankly pessimistic about the global future and yet hope is still present. Its first chapter begins with a quote from Aurelio Peccei, the founder of the Club of Rome, that resonates with hope, for “the future can still become what we reasonably and realistically want” (Meadows et al., 2004, p. 1). Hope is underscored in the third edition by interrupting four chapters’ presentation of computer-generated scenarios based on different assumptions, with an outline over the course of one chapter of the ozone-hole episode, “one story that offers a foundation for hope” (Meadows et al., 2004, p. 179).

The 30-Year Update outlines the results of 11 different scenarios, each covering two centuries’ (1900-2100) historic and projected data by means of 11 variables globally, shown in three graphical analyses for each scenario covering the “state of the world”, “material standard of living” and “human welfare and ecological footprint”. The third graphical analysis is based on the ecological footprint model developed by Wackernagel and Rees in 1996, which continues as a useful tool to track overshoot (Wackernagel et al., 2002). The model at the core of the *LTG* work was developed within the systems dynamics research group at the Massachusetts Institute of Technology (MIT) and was strongly influenced by an MIT professor, Jay Forrester. In fact, World3 is based on Forrester’s final documented iteration of the World2 model (Forrester, 1971). The presence of systems thinking in ESD is not surprising as Forrester’s own work in systems dynamics went beyond engineering and policy circles to touch on mainstream K-12 education (Forrester, 1992).

The original *LTG* opened with a statement made by U Thant in 1969, then Secretary-General to the United Nations:

I do not wish to seem overdramatic, but I can only conclude from the information that is available to me as Secretary-General, that the Members of the United Nations have perhaps ten years left in which to subordinate their ancient quarrels and launch a global partnership to curb the arms race, to improve the human environment, to defuse the population explosion, and to supply the required

momentum to development efforts. If such a global partnership is not forged within the next decade, then I very much fear that the problems I have mentioned will have reached such staggering proportions that they will be beyond our capacity to control (Meadows et al., 2004, p. 13).

His statement not only reflects the prevailing conditions of over forty years ago, but remains relevant today, even after decades of change. The *LTG* team address the implicit questions:

What is the situation faced, and in what aspects is choice still available in shaping a more positive outcome? Since U Thant's statement, one aspect that has shifted has been the focus of the debate, moving from purely environmental concern towards concern about sustainable development.

The titles of the various United Nations conferences relating to the environment illustrate this shift. The phrase "human environment" was used in the title of the 1972 Stockholm Conference, the United Nations Conference on the Human Environment. Twenty years later, *BTL* appeared at the time of the 1992 Rio Conference, or Earth Summit, the United Nations Conference on Environment and Development (UNCED), which produced the important output document *Agenda 21* (UNCED, 1992). The human perspective was still present, but the perception of the relationship between humans and the environment was shifting. Development entered the dialogue with the 1987 Brundtland Commission's phrase of sustainable development and the emergence of ESD at Rio. Both Rio+10, the Earth Summit 2002 in Johannesburg (World Summit on Sustainable Development, WSSD), and Rio+20, the Earth Summit 2012, held again in Rio (United Nations Conference on Sustainable Development, UNCSD), place the concept of sustainable development at the heart of these international environmental conferences.

Yet sustainable development is hard to interpret accurately, and can be represented within the context of a wide range of values. As will be discussed in Chapter 3, there are related definitional issues around ESD as well. The debate regarding the nature of sustainable development and associated values from preservation through to exploitation of natural resources

has been touched on by many, including the environmental educator Alan Reid, in his article “Exploring Values in Sustainable Development” (1996). In the preface to *The 30-Year Update*, Dennis Meadows and Jørgen Randers reflect more grimly on the value of this debate, given that

we now know that humanity failed to achieve the goals of Rio. The Rio+10 conference in Johannesburg in 2002 produced even less; it was almost paralyzed by a variety of ideological and economic disputes, by the efforts of those pursuing their narrow national, corporate, or individual self-interests.... And world society is still trying to comprehend the concept of *sustainability*, a term that remains ambiguous and widely abused even sixteen years after the Brundtland Commission coined it (emphasis in the original; Meadows et al., 2004, p. xiv).

An illustration of such paralysis was seen as the 19th Commission on Sustainable Development (CSD) came to a close. Each spring since Rio, the UNCSD has taken place in New York City, working through a rotating agenda every year, in its progression towards Rio+20 and beyond. At the CSD-19 the G77 took issue regarding phrases associated with a “green economy” as well as “transition to a cleaner and more resource-efficient economy” which were to be included in the closing document for the meeting. Sadly, the CSD-19 came to an end on 13 May, 2011, without a closing document; difficulties arose over the discussion of sustainable production and consumption (Barber, wssd-educationcaucus, 16 May 2011). Similarly, 2012’s Rio+20 agreement “Building the future we want” was almost universally characterized in the press as hamstrung by the oil producing lobby. For instance, *The Economist* reported that

Hidden among the caveats and hobby-horses in the provisional agreement ... were at least a clutch of potentially useful ideas and promises.... Yet, despite great pressure from greens and European governments, oil producers buried this in caveats, making it all but meaningless (Economist, n.d.).

This is but one example of the difficulties of working to implement sustainable development, particularly at high-level meetings.

In many ways, the work of *LTG* is to model what is meant by sustainable development. In 1972 the team’s findings and their prediction of the serious repercussions of continuous growth on a finite planet were controversial. By the time of the 20-year update, *BTL* provided

evidence that humanity had overshoot Earth's support capacity, with this finding reflected in the title. With *The 30-Year Update*, the finding of overshoot is developed. Meadows and Randers bring the preface of *The 30-Year Update* to a close with this sobering statement regarding their plan to provide the 40th anniversary of their report in 2012:

By then we expect there will be abundant data to test the reality of overshoot. We will be able to cite proof that we were right, or we will have to acknowledge data indicating that technology and the market have indeed boosted global limits far above the demands of human society. Population and economic declines will be imminent, or the world will be preparing for many more decades of growth (Meadows et al., 2004, p. xxii).

There are inescapable resonances between the statements at the outset of the 1972 and 2004 editions, by U Thant and by Meadows and Randers.

In writing the third edition, the authors were clear regarding their motivations, which included rectifying problems arising from the first edition. For instance, “we failed totally to get the concept of ‘overshoot’ accepted as a legitimate concern for public debate” (Meadows et al., 2004, p. xx). Regarding which tools to use in transitioning towards sustainability, the team shares that

in our own search for ways to encourage the peaceful restructuring of a system that naturally resists its own transformation, we have tried many tools. The obvious ones are displayed through this book – rational analysis, data gathering, systems thinking, computer modeling, and the clearest words we can find.... Like recycling, they are useful, necessary, and they are not enough. We don't know what will be enough. But we would like to conclude by mentioning five other tools we have found *helpful*.... visioning, networking, truth-telling, learning, and loving (emphasis in the original; Meadows et al., 2004, p. 271).

The fact that learning is one of the tools for transitioning to sustainability is not surprising, for how can change that amounts to a true paradigm shift be implemented without it? Taken as a whole, moreover, these tools suggest the paramount importance of fostering sovereignty as a characteristic, as will be further discussed in Chapter 8 of this thesis.

The three authors of *The 30-Year Update* varied in their level of innate optimism, faith in humanity and the power of learning. In many ways, *The 30-Year Update* is a tribute to Donella

Meadows, the most optimistic of the trio, who died a few years before its publication. As described in the preface,

she was a caring, compassionate believer in humanity. She predicated her entire life's work on the assumption that if she put enough of the right information in people's hands, they would ultimately go for the wise, the farsighted, the humane solution – in this case, adopting the global policies that would avert overshoot (or, failing that, would ease the world back from the brink.... The message [of *The 30-Year Update*] is that if we persist in our pedagogic effort, the world's people will increasingly choose the right way ahead, out of love and respect for their planetary companions, current and future, human and nonhuman. We fervently hope they will do so in time (Meadows et al., 2004, pp. xvi-xvii).

The excerpt above regarding Donella Meadows and her beliefs provides an insight into an individual believing in the power of pedagogy and could be read in conjunction with Rachel Carson's *The Sense of Wonder*, discussed in the next chapter, as an example of a complementary belief in the power of connecting with nature in shaping a liveable future. It is significant that *The 30-Year Update* both ends and begins with statements of hope and confidence in the importance of learning, the quality of our thinking, and pedagogy.

Economy

If the environment relates to the physical surroundings we find ourselves in and is the fundamental limiting factor of life on Earth, the economy relates to the production and consumption of goods and services and is a primary driver of impact on the environment. In neoclassical economics, neither the goods and services Earth provides nor its ability to assimilate waste are valued, but rather are considered externalities. This key perceptual gap is the focus of ecological economics, which views the economy as a subsystem of the biosphere, for example by monetizing ecosystem services (Costanza, 1991, 2003; Daly & Farley, 2004). Much of the timeline and conditions that have brought ecological economics and its principles into the mainstream are similar to those that shaped the environmental movement, including systems

thinking, paradigm shifting and a lengthening of scales, particularly of space and time, which all bear relevance to the sphere of learning as well.

One of the founders of ecological economics, Kenneth Boulding, published an article three years before Buckminster Fuller's *Operating Manual for Spaceship Earth*, which was entitled "Economics of the Coming Spaceship Earth" (1966). Boulding, an Oxford-educated general systems theorist, put forth an economics which focused on the idea of limits. In 1973 two publications emerged from opposite sides of the Atlantic, both of which also touched on the issue of limits and scale: German-born British economist E.F. Schumacher's *Small is Beautiful* and U.S. economist Herman Daly's *Steady-State Economy*. Daly, a founder of ecological economics, was a senior economist at the World Bank's environment department, and has remained active in his influence into the 21st century, for instance presenting *A Steady-State Economy* at the UK's Sustainable Development Commission (Daly, 2008). Howard T. Odum, another founder of ecological economics, instituted around 1958 a methodology to value ecosystems services by converting photosynthetic energy of wetlands to dollar equivalent. He refined and applied this approach to other ecosystems, including the calculation of the replacement value of individual trees in a century-old forest (1971). Odum's work, some of which was completed through collaborating with his ecologist brother Eugene, clarified the link between human economic and social systems and ecological systems.

Odum completed his PhD at Yale in 1950 under Evelyn Hutchinson, a prolific Cambridge-educated scientist celebrated for his widely varied research interests. Hutchinson, arguably the most important ecologist of the 20th century, was based at Yale for more than 40 years, and had so many graduate students (he supervised 48 students who completed their doctorates) that phylogenetic trees of his intellectual descendants have been constructed, as done by Marian A. Kohn for the special issue of *Limnology and Oceanography* dedicated to Hutchinson at the time of his retirement (Edmondson, 1971, p. 163). A second-generation

descendant of Hutchinson is one of Odum's graduate students, Robert Costanza, who completed his PhD in systems ecology (University of Florida, 1979), yet whose work has been instrumental in the field of ecological economics. As only doctoral students with completed degrees or who were expected to be completed in 1971 are indicated in Kohn's image, Costanza is not included. However, associated with Gordon A. Riley, the first of Hutchinson's doctoral students to be awarded his PhD (in 1937), is my own MSc supervisor, Robert J. Conover (awarded his PhD in 1955, he left Yale just after Odum). Riley wrote the introduction to the special issue, where he describes that Hutchinson "has imbued at least some of his students with a feeling that science is an artistic achievement, to be relished as such" (Riley, 1971, p. 177) and that there was a "place in science for imaginative hypotheses" (Riley, 1971, p. 178).

Hutchinson's legacy remains vibrant in his intellectual progeny. Much of Robert Costanza's work has focused on larger spatial and temporal scales, which in the results section of this thesis are considered in the long and wide views. While one might guess that most of the study's participants are not familiar with the details of work by ecological economists such as Costanza, the concerns shared in a number of responses express a significant awareness that thinking about beyond-proximal time and space entails an economic dimension. As an example of this extended economic perspective, in a ground-breaking 1997 *Nature* article Costanza and a research team of ecologists and economists took a global view of valuation forty years after Odum's beginnings. In "The Value of the World's Ecosystem Services and Natural Capital", the team placed a minimum estimate of the benefits provided by the world's ecosystems at an average of US\$ 33 trillion per year, at a time when the global gross national product total was around US\$ 18 trillion per year (Costanza et al., 1997). If the cost of ecosystem services exceeds, in fact is almost double, global GNP, then clearly very little of these costs could be factored into global GNP. We are treating them as "free", or perhaps more accurately as a line of credit that we have no plans to pay back, ignoring the possibility of devastating interest charges.

Not Foregrounding Growth

Of the various research fields within ecological economics, ones of particular relevance to this study and sustainability learning include: questioning growth as a strategy; alternative indicators of wealth and well-being; the environmental Kuznets curve, an inverted U-shaped function tracking environmental impact against wealth; and present-day implications of carbon emissions for the planet and its economy. In the post-World War II era, economic growth has been a primary policy objective, around which other policy issues such as the environment, immigration, the arts, transportation, health and education are concerned in terms of their ability to promote, or at the very least, not compromise, the issue of a growing economy. “It’s the economy, stupid” was the phrase that probably helped President Clinton win election in 1992 because of its concision regarding the all-important policy. Fundamentally, however, how can an economy situated within a finite biosphere continue to grow? Does growth actually address society’s concerns regarding well-being, employment and poverty? Of particular interest to educators engaged with ESD, including by their own account a number of the participants in the present study: What is the role of education in aligning society with limitations to growth? If the normative framework of welfare economics is not actually linked to well-being, is it time to consider other options as priorities? Scientists have shown the toll growth has taken on the environment. Both before and since the 1973 paradigm-shifting publications by both Schumacher and Daly, economists have questioned the feasibility and desirability of economic growth, which is often used synonymously with growth in the gross domestic product, or GDP. The *LTG* team did use quantitative models as a means of looking at growth, but they were based on systems dynamics rather than economics, and consequently attracted criticism. What Peter Victor’s 2008 book, *Managing Without Growth: Slower by Design, Not Disaster*, does that others have not is to use econometric models to explore the possibility of meeting important policy goals without economic growth.

The impetus for the book was an invitation for collaboration between Victor and his former PhD supervisor at the University of British Columbia, Gideon Rosenbluth. Their paper “Managing Without Growth” (Victor & Rosenbluth, 2007) appeared in *Ecological Economics* the year before the book was published and presents the first results of LOWGROW, a dynamic simulation model. Both publications assert the same principle regarding growth: “Not that zero growth should displace ‘going for growth’” (Victor, 2008, 184). “Rather that the dependence on and defense of economic growth should not be an obstacle to fulfilling more specific welfare-enhancing objectives of full employment, eliminating poverty, and protecting the environment” (Victor & Rosenbluth, 2007, p. 492).

What the LOWGROW models on which Victor’s analyses are based have been able to show is that slower growth “can be consistent with attractive economic, social and environmental outcomes: full employment, virtual elimination of poverty, more leisure, considerable reduction in GHG emission and fiscal balance” (Victor, 2008, p. 183). Although debate will continue, other researchers are aligning themselves with Victor’s stance. For instance, James Gustave Speth, formerly the Dean of the Yale School of Forestry and Environmental Studies, noted the benefits of the United States coming into its own as a post-growth society (Speth, 2011). The possibility of managing without growth would enable a nation like Canada to shed the growth that has become uneconomic. Instead the pursuit could be endeavoured of a level of growth that is both appropriately scaled for the biosphere and supportive of social justice by allowing room for developing nations to grow.

Indicators and Genuine Progress

The case has been made that economic growth and a rise in the GDP do not need to continue as a primary policy objective, yet GDP’s ubiquity assures its continuation as an influential indicator for some time to come. What is it that the GDP is an indicator of, and is it

aligned with societal goals in the 21st century? GDP is the most widely used measure of economic activity, defined by the OECD as the value of the goods and services produced by a country during a period, whereas GNP includes production in other countries by domestic companies (<http://www.oecd-ilibrary.org>). These mainstream economic indicators do not distinguish between depleting and sustaining activities for either the planet or humans; however, ecological economists have developed alternative measures for both weak and strong sustainability (Neumayer, 2003; Victor, 2005). John Kenneth Galbraith commented on this quandary in his 1958 publication, *The Affluent Society*, pointing out that the GDP would not differentiate between educational services provided or televisions purchased (Galbraith, 1958/1998). A decade later, Robert Kennedy spoke about the GNP during his 1968 U.S. presidential campaign. He pointed out the problems for a nation using a measure such as the GNP in his remarks at the University of Kansas on 18 March:

...that Gross National Product counts air pollution and cigarette advertising, and ambulances to clear our highways of carnage. It counts special locks for our doors and the jails for the people who break them. It counts the destruction of the redwood and the loss of our natural wonder in chaotic sprawl.... Yet the Gross National Product does not allow for the health of our children, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country. It measures everything in short, except that which makes life worthwhile (Kennedy, 1968).

It is interesting to note that Kennedy mentions both education and learning under the category of things not fully valued by an indicator such as the GDP. If the GDP measures both “goods” and “bads”, how does it relate to individuals’ and society’s goals of improving the quality of life?

The Cambridge economist Arthur Cecil Pigou’s work pre-dated and continued up to Galbraith’s period. Pigou’s landmark treatise *The Economics of Welfare* remains of influence yet was published first in 1920, with the fourth revised edition released in 1952 and reprints into the 21st century. Although the terminology used by Pigou (1952/2002) has shifted from national

dividend to GDP, GNP or GNI (Gross National Income), and welfare or human well-being to happiness, Pigou's ideas laid the groundwork for what has subsequently become a developed field, happiness economics. As he pointed out: "It is evident that, provided the dividend accruing to the poor is not diminished, increases in the size of the aggregate national dividend, if they occur in isolation without anything else whatever happening, must involve increases in economic welfare" (Pigou, 1952/2002, p. 82). So it seems that one reason for interest in an increase in the GDP is that it might bring with it an increase in that nation's general welfare, as long as income disparity does not increase. This is encapsulated by the expression "a rising tide lifts all boats," sometimes adopted as a mantra of conservative economics.

Peter Victor created a model in 2008, HappyGrow, for illustrative purposes regarding individuals' spending, to support his discussion of economic growth as it relates to happiness. He outlined five different scenarios over a timeframe of 50 years while varying income, contributions to the public good through tax, and ratios of use or status for consumables and durables purchased. Through the model, he showed that "if people understood that demonstrating status through consumption is self-defeating it might help relieve the pressure on the environment caused by making, distributing, using and disposing of these goods as well as on the people themselves" (Victor, 2008, p. 149). In this view, he is in close alignment with David Orr, quoted at the outset of this chapter, and indeed Victor's work generally targets the same myth of happy affluence to which our society clings. Happiness is encompassed by an individual's total utility, and Victor points out the trend across the scenarios:

all the scenarios have in common the feature that total utility increases most rapidly in the early years when people are buying goods entirely or mostly for use. When the desire for status drives people's consumption total utility can still rise but more slowly. This is consistent with the general notion of the diminishing marginal utility of income (Victor, 2008, p. 150).

It was Manfred Max-Neef who considered the diminishing marginal utility of income on a national level. This research emerged in 1991, when Max-Neef first proposed his threshold

hypothesis, appearing along with statistical evidence in *Ecological Economics* in 1995. This hypothesis proposes that

for every society there seems to be a period in which economic growth (as conventionally measured) brings about an improvement in the quality of life, but only up to a point – the threshold point – beyond which, if there is more economic growth, the quality of life may begin to deteriorate (Max-Neef, 1995, p. 117).

Five nations were represented, with two graphs for each nation showing the trend of the Index of Sustainable Economic Welfare (ISEW) and of GNP over time, as well as the relationship between the ISEW and GNP. Herman Daly and John Cobb Jr. had first published the ISEW in *For the Common Good* in 1989, enabling Max-Neef's graphical analysis. For each nation, a peak representing the threshold for that nation is indicated, with that peak arising in the 1970s for the United States and United Kingdom, and in the early 1980s for Germany, Austria and the Netherlands (Max-Neef, 1995, p. 116). As "an afterthought", Max-Neef questions the degree to which the political stance of a nation might influence its threshold and the decline in experienced well-being of a nation's citizens.

The growing disparity between GDP and well-being outlined by Max-Neef was echoed in an article published the same year (1995) in *The Atlantic Monthly* by three members of Redefining Progress, a nonprofit organization that was based in San Francisco. Clifford Cobb, Ted Halstead and Jonathan Rowe wrote an article asking: "If the GDP is Up, Why is America Down?" They identify manifold problems with the GDP, but they reference in particular Herman Daly's succinct summary: "The current national accounting system treats the earth as a business in liquidation" (Cobb, Halstead & Rowe, 1995, p. 66). The Genuine Progress Indicator (GPI) created by this team 1994, a modified version of the ISEW, is designed to allow a better determination of whether real progress, taking social capital into account, is made as economies grow. In a graph showing the relationship between the GDP per capita and the GPI per capita for the United States between 1950 and 2004, both indices grew until the late 1970s, at which

point the GPI per capita remained at the same level while the GDP per capita continued to rise (Victor, 2008, pp. 129-130). This plateau occurs almost simultaneously with the ISEW threshold mentioned by Max-Neef for the United States.

Nobel laureate Indian economist Amartya Sen was invited to devise an alternative measure to the GNP two decades ago, and he was also part of a core team commissioned in February, 2008 by the then President of the French Republic, Nicolas Sarkozy, to “identify the limits of the GDP as an indicator of economic performance and social progress” (Stiglitz, Sen & Fitoussi, 2009, p. 7). The French nation famously values quality of life and so Sarkozy’s announcement to create what the Wall Street Journal terms a “*joie de vivre* index” was not met with undue surprise (<http://online.wsj.com/>). Rather, it was bolstered by the burgeoning evidence of the failure of GDP growth aligning with citizens’ happiness.

In addition to Sen, Sarkozy’s commission also included as its chair another Nobel laureate, Joseph Stiglitz, and Jean-Paul Fitoussi, of Sciences Po, L’Institut d’études politiques de Paris. These three were joined by a team of two dozen other economists and social scientists from France, India, the United States and the United Kingdom, including Sir Nicholas Stern and Daniel Kahneman. They point out some of the problems related to the GDP, explaining:

what we measure affects what we do; and if our measurements are flawed, decisions may be distorted. Choices between promoting GDP and protecting the environment may be false choices, once environmental degradation is appropriately included in our measurement of performance (Stiglitz et al., 2009, p. 7).

The report of the Stiglitz commission calls for governments to use alternative indicators to the GDP, in a shift from production measures towards metrics that that would incorporate not only the quality of life for current and future generations, but also for sustainable development and the environment. Strikingly, however, the commission stopped short of Sarkozy’s mandate to develop an alternative to the GDP themselves.

In 2006, American psychologist Daniel Kahneman and his team published an article in *Science* that asked: “Would You Be Happier if You Were Richer?” They found that across four wealth cohorts of family income, ranging from under \$20,000 to over \$90,000 in the United States, the percentage of people reporting to be “very happy” increased with wealth. However, the largest response rate was for “pretty happy”, which held across all cohorts (Kahneman, Krueger, Schkade, Schwarz & Stone, 2006, p. 1909). It was also in 2006 that Canadian economist John Helliwell, who has done comparative research into happiness levels in almost 50 countries, jointly presented on happiness with Richard Davidson at the Dalai Lama Center for Peace and Education (Dalai Lama Center, 2006). Davidson, a Harvard-trained neurophysiologist based at the University of Wisconsin-Madison, has related left pre-frontal cortex activity not only with higher cognition, but also with self-reported happiness. Electrical activity increased in response to monetary reward, yet remained stable within cohorts of participants over time, even though their purchasing power increased (Davidson, 2003, p. 656). Davidson’s work will be further addressed in the next chapter, in terms of its relevance to a deep shift in thinking that many in the field of environmental education, and several of the participants of the study, consider to be essential to successful sustainability learning for students. In 2006, London School of Economics Professor Lord Richard Layard published findings covering the period 1945 to 2000, contrasting rising per capita incomes in the United States with stagnating levels of happiness. He showed that “there has been no increase in happiness since the 1950s – nor any significant decrease in unhappiness” (Layard, 2006, C24). In Layard’s view, a commensurate shift in public policy is required once this fact is acknowledged.

Layard aligns strongly with the 18th century philosopher Jeremy Bentham, who held that public policy should support the greatest happiness for the greatest number of people. As such, it was appropriate that Layard addressed the Well-Being Conference at the British Treasury on 25 November, 2010, where Prime Minister David Cameron announced that the UK Office for

National Statistics would start measuring subjective well-being (Gross National Well-Being, GNW) and use the index to guide national policy (<http://www.nationalaccountsowellbeing.org>). Cameron's announcement marked the United Kingdom's move to join other pioneering nations in collecting official statistics on national well-being.

In 2009, a group including Robert Costanza and John Talberth published a paper, "Beyond GDP: The Need for New Measures of Progress", that found resonances in a 2007 conference, *Beyond GDP*, jointly held by the European Commission, the European Parliament, the Club of Rome, the OECD and the World Wildlife Fund (WWF). Costanza's team point out that measures such as the ISEW, GPI, Green GDPs and Genuine Wealth indicators all use the "GDP as the foundation and then add or subtract quantities in an attempt to address some of the issues... [and as such] these measures still have limitations" (Costanza, Hart, Posner & Talberth, 2009, p. 11). In contrast, there are indices that do not use the GDP, such as the Ecological Footprint, Gross National Happiness (GNH) and Subjective Well-Being (SWB). In their discussion, they point out that "we desperately need to build consensus on new measures" (Costanza et al., 2009, p. 30). Talberth also authored a chapter, "A New Bottom Line for Progress", in the 25th anniversary edition of the Worldwatch Institute's *State of the World 2008*. Significantly, the central theme for this publication was "Innovations for a Sustainable Economy". Here, he shared William McKibben's finding in his 2007 publication, *Deep Economy*, "that above an income of roughly \$10,000 per person, the correlation between happiness and income no longer exists" (Talberth, 2008, p. 21). McKibben's finding is half of the \$20,000 that Helliwell had suggested as a similar breakpoint just a few years previously (Helliwell, 2003). Talberth mentioned other macroeconomic indicators that can supplement the GDP, such as the Happy Planet Index (HPI) first published in 2006 by the New Economics Foundation and Friends of the Earth (Talberth, 2008, p. 24). It is Talberth's hope that governments would "back a suite of creative indicator initiatives, giving the world a better and

more holistic portrait of progress being made in the twenty-first century toward both happy people and a happy planet” (Talberth, 2008, p. 31). In the following year, the Stiglitz commission’s conclusions were in agreement with Talberth’s suggestion for such a suite of indicators, and for Costanza’s team’s suggestion of building consensus for its use.

The Stiglitz commission’s report was published 75 years after Nobel laureate Simon Kuznets made his first report to the U.S. Congress, warning against the use of the GNP as a measure of the nation’s well-being. His work related to economic growth and income distribution, but he had been particularly instrumental in standardizing the measurement of GNP, while realizing its limitations. He pointed out that “the welfare of a nation [can] scarcely be inferred from a measure of national income” (Kuznets, 1934).

Kuznets, Curves, and the Economy

In 1955, Kuznets published his findings relating income inequality to income per capita, which appeared to follow an inverted U-shaped function. About 40 years later, there appeared an abundance of research relating environmental impact to wealth resulting in graphical analysis of a strikingly similar shape and so termed the environmental Kuznets curve (EKC). The classic shape is seen with empirical evidence for locally-emitted substances such as sulphur dioxide, nitrogen oxides, carbon monoxide, impure water supplies and suspended particulates increasing with wealth to a maximum point, after which they abate as wealth continues to increase (Selden & Song, 1994). A challenge within the EKC literature has been the suggestion that the majority of the world’s population appears to be on the rising part of the curve, with more environmental damage to ensue before abatement might occur (Ekins, 1997). The variety of methodologies and pollution types studied has meant a large range of estimates regarding the income at which the turning point is reached (Dinda, 2004). A notable exception to the general pattern where oxides peak and then reduce at higher incomes is that of CO₂, which continues to increase with wealth

(Arrow et al., 1995). One can hypothesize that this trend for CO₂ reflects the close connection of carbon to the energy demands of affluent nations, which in contrast to other pollutant drivers appear not to drop off with increasing wealth.

The increase in pollution is an initial consequence of early industrialization, whereas the reduction reflects the nation focusing on policies and institutions to protect the environment as well as individuals having access to more efficient technologies and sufficient discretionary income to allow choices among less polluting alternatives (Stern, Common & Barbier, 1996). The resilience of the ecosystem affected by the pollution is crucial in determining its ability to sustain increased economic activity. A key outstanding question is whether or not the pollution in question will reduce in time for a given system to recover, as opposed to a system flip or some other non-linear response occurring, leading to a permanently changed system (Arrow et al., 1995). Touching on Holling's (1973) work on resilience, a system "flipping" can actually be a healthy or resilient response, but it can also appear very similar to the system "crashing" under unsustainable environmental stress. Problems relating to the econometrics behind the EKC have been noted, as well as concern that the EKC seems to apply only to a small section of air pollutants rather than other forms of waste production, species extinction and issues of global environmental degradation (Stern, 2003; Victor, 2008).

The special case of CO₂ is of interest beyond the EKC literature. It matters little whether CO₂ rises with wealth without abatement, or whether a turning point exists for CO₂ but at such a high income as to ensure that in most cases massive environmental damage would precede it. Two things are clear, however, that keep CO₂ at the heart of attention: the challenge that this abundant, long-lived molecule has been widely shown to be the cause of global environmental change, with a great deal of its atmospheric prevalence relating to human activity; and the success in reducing CO₂ emissions of select nations such as Sweden, indicating the possibility of

not only improving the efficiency of GHG emissions to GDP, but of decoupling the rate of emissions from the economic strength (OECD, 2011).

Climate Change: The Anthropogenic Factor

In 2006, *An Inconvenient Truth* appeared. The book was published, the film version premiered at the Sundance Film Festival in January of that year, and former U.S. Vice President Al Gore presented his slide-show to increasingly large and engaged audiences around the world. A central point that Gore makes relates to the anthropogenic contribution of carbon dioxide to the atmosphere, its link to global warming, the complex trail of environmental disaster in the wake of GHG emissions, and action that can be taken to bring about change. Through his work, Gore has brought widespread attention to the distinctive saw-toothed pattern of increasing concentration of atmospheric CO₂ (where the “teeth” represent seasonal fluctuations in the effect due to the vast boreal forests in Canada and Siberia). Gore was introduced to this graph by one of his professors at Harvard, Roger Revelle, who had been the director of the Scripps Institution of Oceanography (SIO) and had brought climatologist David Keeling to the SIO in 1958.

Keeling was tasked with setting up a research base in Hawaii, the Mauna Loa high altitude observatory. At 3400 m, it was remote and well-located to monitor atmospheric CO₂ with minimal influences from vegetation and human activity. In 1976 he and his colleagues published the first dozen years of their findings, which included the graph now known as the Keeling curve: the annual seasonal variation due to northern hemisphere deciduous plant growth and CO₂ uptake seen within the overall trend of increasing CO₂ (Keeling et al., 1976, p. 546). It had been an early version of this curve, evocative of the planet “breathing” on an annual cycle, which Revelle had shown his class of undergraduates in the mid-1960s that had captured Gore’s attention (Gore, 2006, p. 30). The collection of data regarding CO₂ that began in 1958 at Mauna Loa has been continued by Scripps and the National Oceanic and Atmospheric Administration

(NOAA), with the trend identified by Keeling continuing, seemingly inexorably, in the same pattern more than half a century hence. In their early study at Mauna Loa between 1959 and 1971, the annual average CO₂ concentration rose 3.4%, which “agrees closely with 3.1% found for the South Pole for the same time interval” (Keeling et al., 1976, p. 549). The team concluded that “...the observed long term trend of rising CO₂ appears clearly to be in response to increasing amounts of industrial CO₂ in the air on a global scale” (Keeling et al., 1976, p. 550). The monitoring shows that atmospheric CO₂ concentrations have risen from about 315 ppm in 1958 to 393.18 ppm over Mauna Loa in April, 2011, or a globally averaged surface concentration of 391.55 ppm as at March, 2011 (NOAA, n.d.). *An Inconvenient Truth* outlines these and other atmospheric changes, their significance particularly with respect to global warming, and associated, varied and far-reaching repercussions.

Global warming – Gore’s focus – is but one part of the more complex issue of climate change. The Intergovernmental Panel on Climate Change (IPCC) is an international body based in Geneva, set up by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988, currently representing 194 nations. It has produced four assessment reports, beginning in 1990 and thereafter every five or six years, which it states is “an effort by the United Nations to provide the governments of the world with a clear scientific view of what is happening to the world’s climate” (IPCC, n.d.). The IPCC was awarded the Nobel Peace Prize in 2007 for their work, the year the fourth assessment report was released. In just six years, those between the third and fourth assessment reports, the IPCC was able to include a diagrammatic framework of anthropogenic climate change drivers, impacts and responses, detailing links between human and Earth systems to an extent not possible before.

They state:

At the time of the Third Assessment Report (TAR) in 2001, information was mainly available to describe the linkages clockwise, i.e. to derive climatic changes and impacts from socio-economic information and emissions. With increased

understanding of these linkages, it is now possible to assess the linkages also counterclockwise, i.e. to evaluate possible development pathways and global emissions constraints that would reduce the risk of future impacts that society may wish to avoid (IPCC, 2007, p. 26).

It seems that the reports are at the strategic point of not only being able to outline the sources of the problem in some detail, but also possible solutions.

The significance of the IPCC reports' elucidation of causes is that the fundamental problem behind anthropogenic climate change lies in human choices, which when redirected can also be the primary instrument for positive change. The fourth IPCC report is clear that both climate change and global warming are occurring with widespread consequences, and that there are human causes to climate change. For instance, in Chapter 3 of the fourth IPCC report, the connection is made between GHG concentrations atmospherically and their impact on ocean acidification. The lowering of ocean pH and associated, tightly coupled negative effects on aquatic systems is just one example of a complex and developed field of study subsumed into the IPCC report. The problem of ocean acidification was documented in the engaging and visually stunning film "A Sea Change", narrated and co-produced by Sven Huseby in 2009. This is perhaps the first documentary film to bring the issue of ocean acidification to a wider audience as one example of the effects humans have brought about through GHG emissions (Ettinger, 2009): it is tellingly subtitled "Imagine a World Without Fish." Relevant subthemes related in the results chapters of this thesis have to do with consequences and interconnections of entities, the following quote from a study participant being sadly relevant:

I want my son's children to see bass babies, bass hatchlings [at the cottage] some day, but I don't know if that's going to happen (CA-Admin1, p. 3).

The fourth IPCC report notes other aspects of climate change where the human influence can be detected:

It is *very likely* that the response to anthropogenic forcing contributed to sea level rise during the latter half of the 20th century. There is some evidence of the

impact of human climatic influence on the hydrological cycle, including the observed large-scale patterns of changes in land precipitation over the 20th century (emphasis in the original; IPCC, 2007, pp. 40-41).

The fourth report compares its results and statements to statements in the third report regarding the extent of the problem and the role of humans in its creation; in both cases the situation is clarified and strengthened.

Economic Consequents

The IPCC has shown that there has been dangerous anthropogenic interference with the climate system. The logical consequent is that according to the United Nations Framework Convention on Climate Change (UNFCCC), one of the three conventions adopted in 1992 at the Earth Summit in Rio UNFCCC, the 195 nations party to it are legally bound to reduce their GHG emissions (UNFCCC, n.d. b). Noticeable skepticism has arisen regarding the financing and affordability of such a step. Arguably, part of the reason for this is that individuals genuinely struggle to see the connection between significant international treaties (such as the Kyoto Protocol, a more recent addition to the UNFCCC adopted in 1997 and brought into force as international law in 2005) and their personal lives, their classroom activities or, indeed, work such as theses on ESD. A view diametrically opposed to such skepticism has been that of Sir Nicholas Stern, the Oxbridge-trained former World Bank chief economist behind the 2006 *The Economics of Climate Change: The Stern Review*. The position of *The Stern Review* is that the international community literally cannot afford to be inactive regarding GHG abatement.

Under the Blair administration, the United Kingdom had been producing a number of documents with the intention of realigning practices in the economic, environmental and educational sectors towards sustainable development. *Securing the Future*, published in March 2005, was a watershed document, requiring all government departments to develop sustainability policies and action plans. And so it was in July 2005 that the then Chancellor of the Exchequer

and future Prime Minister, Gordon Brown, appointed Stern to lead the team that would publish *The Stern Review* in October 2006. After outlining the science of climate change, its impacts and the economics of stabilization, the second half of *The Stern Review* outlines policies for both mitigation and adaptation, as well as developing a framework for international collective action.

Relating how Earth's climate is changing, *The Stern Review* stated that the “warming effect due to all (six Kyoto) greenhouse gases emitted by human activities is now equivalent to around 430 ppm of carbon dioxide (CO₂e) and rising at around 2.3 ppm per year” (Stern, 2006, Chapter 1, p. 3). Temperature projections quoted from various scientific reports, including the IPCC work and that done at the well-respected Hadley Centre, suggest that aiming for a stabilization level of 500 or 550 ppm would probably involve a projected temperature increase in the range of 2.0–5.3 °C (Stern, 2006, Chapter 1, p. 12). Achieving even this much control over GHG emissions comes at a cost. As *The Stern Review* states:

if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more. In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year... [to achieve] stabilisation between 500 and 550 ppm CO₂e.... If we delay, the opportunity to stabilise at 500-550 ppm CO₂e may slip away (Stern, 2006, Summary of Conclusions, pp. vi-vii).

Stern also estimated the social cost of carbon. Every tonne of carbon emitted today causes damage worth \$85 (Stern, 2006, Chapter 13, p. 287). This estimate is strongly affected by methodology considerations such as discount rates for the future impact of climate change, and equity weighting “attached to the valuation of impacts in poor countries” (Stern, 2006, Long Executive Summary, p. ix). Common estimates of these costs vary by more than three orders of magnitude, from negligible to £1000/tCO₂, with lower discount rates and equity ratings across regions resulting in higher estimates as well as larger uncertainties (Stern, 2006, Chapter 13, p.

288). *The Stern Review* is unique in its role of comprehensively estimating the enormous impact on the global economy by an environmental problem driven by human activities.

A symposium on *The Stern Review* was held on 15 February, 2007, at Yale University's Center for the Study of Globalization, serving to air the views of both its proponents and its critics. One of the critics of Stern's work is London School of Economics Professor Eric Neumayer, who pointed out that *The Stern Review* failed to tackle the issue of non-substitutable loss of natural capital (Neumayer, 2007). Chris Hope of Cambridge University, who had designed the mathematical model used as an analytical foundation in *The Stern Review*, and Sir Nicholas Stern engaged in a day's discussion with senior academics, including among others, William Nordhaus and Robert Mendelsohn of Yale and Columbia University's Jeffrey Sachs. The symposium came just two weeks after the release of the fourth IPCC report with its plethora of new information. Far from retracting statements from *The Stern Review*, Stern suggested that his team had actually underestimated the risks and damage associated with climate change. Since *The Stern Review*'s publication, Stern has stated that "strong and urgent action is in fact good economics" (Dietz & Stern, 2008, p. 94). It is certainly worthy of a renewed sense of hope, both for progress within the economic debate and for our planet's outlook, that a senior economist such as Stern would consider that we are capable of aligning action towards an ameliorated future and that we would be extremely well advised to do so.

Conclusion

The framework used for the discussion of this chapter and the next has been taken from that of sustainable development, where the spheres of the environment, economy and society are viewed individually and in their interactions as an interconnected unit. The case for the environment was raised first as fundamentally this is the most crucial of the spheres, without which no other concerns exist. The findings show the state of the environment to be at risk, as

well as making plain the influence of human choices and actions in the problem. As some researchers have suggested, in a very literal way humans and other life forms are the environment and an economics that ignores the reality of interconnection brings about significant problems, as illustrated by Donella Meadows and her colleagues. The latter part of the chapter had as its focus the economy as it is currently viewed in terms of a neoclassical paradigm and the role of economic choices driving environmental impact. The case was made that society's values are reflected in the economy. Possibilities were raised regarding an alternative economic model, one more aligned with the limitations that exist on a finite planet, such as that developed by ecological economists.

The implications for education and the role of learning relate to the idea that progress in economic thinking will only be possible with at least a partial relinquishment of the existing neoclassical economic paradigm. A paradigmatic shift of this magnitude in an arena that conditions virtually every aspect of modern life carries deep implications for the educational challenges around environmental awareness. This consideration also has implications for the motivation of environmental educators who may feel relatively powerless as individuals; and indeed, issues around motivation and action emerge as a strong theme in the outcomes and findings of the study. The following chapter will explore how the case can be, and is being made to support learning that will equip students for a fundamental shift in thinking, a point that will continue to be developed through the results chapters of this thesis. Arguably, it will only be through a shift in thinking that a shift towards a new economic paradigm, and thus towards a more sustainable relationship with our global environment, may be realized.

Chapter 3:

Charting the Context for a Liveable Future Through Learning

Introduction

The systems thinking I told you about before.... Jay Forrester talked about systems thinking as a way of thinking, and learning, and managing, and problem-solving.... It's not just viewing the world in a certain way, but that has to be manifested through how your organization works. The reason that you have good teaching practice, small group work ... why? Because it reflects the interconnectedness of things (CA-Coord, p. 57).

Systems thinking, as the interview excerpt above suggests, is much more than simply “thinking about systems”. As Fritjof Capra says in his 2005 essay, “Speaking Nature’s Language: Principles for Sustainability”, it consists of

a new way of seeing the world and of thinking—in terms of *relationships, connectedness, and context* ... [that] involves several shifts of perception: *From the parts to the whole ... From objects to relationships ... From objective knowledge to contextual knowledge ... From quantity to quality ... From structure to process ... From contents to patterns* (italics in the original; Capra, 2005b, p. 151).

In more recent writing, Capra makes a related point in describing emergence, particularly in systems resistant to change. He points out that

a system will encounter a point of instability that precipitates either a breakdown or the appearance of new forms. This spontaneous emergence of order ... is a key property of all living systems and is the origin of development, learning and evolution.... The new order that appears is not designed by any new individual, but emerges as a result of the organization’s collective creativity (Stone, 2009, pp. 113–114).

British organizational scientist Robert Flood underscores the importance of the role of emergence in systems thinking: “With systems thinking the belief is that the world is systemic, which means that phenomena are understood to be an emergent property of an interrelated whole. *Emergence* and *interrelatedness* are the fundamental ideas of systems thinking” (emphasis in the original; Flood, 2001, p. 133). If sustainability as community practice tends to

induce emergence, emergence itself has its own requirements, particularly around a new style of leadership for individuals willing to engage in this role. Nor is this just theory. As will be described later in this chapter, systems thinking and its organizational consequences are now the reality in many pioneering schools around the world; moreover, within the interview data presented by this thesis, leadership is one of the most commonly touched-on themes. Finally, and with particular relevance to the Canadian schools who participated in the study, systems thinking is mentioned explicitly as a key component of ecological literacy in documents recently produced by the TDSB to support EcoSchools engagement. For example, the *Best Practices* guide offers implementation ideas for systems thinking (TDSB, n.d. a, Section 4, p. 13), while the *Certification Toolkit 2012/13* offers guidance around goals related to systems thinking for TDSB EcoSchools (TDSB, 2012, pp. 109–110) as well as presenting a range of systems thinking tools (see pp. 129–143), including consequence mapping, a technique also cited as useful by Alsop and Pedretti (2001, p. 200).

This chapter contextualizes the research outcomes and findings of this thesis project through the perspective that the manner in which learning is approached influences its outcome. Various terms might be used to describe this, such as fluidity, creativity, or intuition, yet they point in a similar direction, which is toward a living responsiveness to work with the conditions presented. Following a framing of the context for sustainability learning, the major sections of this chapter will focus on connection to the environment, often referred to as a sense of wonder; thinking, which involves knowledge as well as cognition; action, or a sense of engagement. Regarding this final point is a reminder that “It is not enough simply to promote action for the environment; we need to emphasise the most strategic actions” (Gayford, 2009, p. 5). This section draws to a close through an illustration of some of these strategic actions found in living sites on both sides of the Atlantic, which might informally be termed sustainability schools.

Although the relationship is complex, it is my belief that learning remains a powerful player in shaping individuals' thinking and choices regarding the environment as expressed in their sustainability perspectives. David Orr touches on this point at the outset of his foreword to Stephen Sterling's *Sustainable Education: Revisioning Learning and Change*. Orr asks, "If education is the solution, what is the problem?" (Orr, 2001, p. 7). This question has the capacity to reframe much dialogue within education generally, and sustainability learning particularly. Orr cites Thomas Berry's insights in *The Great Work: Our Way into the Future* (2000) as an invitation towards "remaking the human presence on the Earth.... This requires a new understanding of ourselves and our place in nature and in time. This is *the* challenge of education" (emphasis in the original; Orr, 2001, pp. 8–9). Orr states that Sterling's proposal in moving in this direction is for

an education that sustains "the whole person – spirit, heart, head and hands" and reclaims the authentic tradition of education ... rooted in place and tradition. It is oriented to the pace at which the young learn well ... [it] engages, educates, encourages, and enthuses ... [it] encourages spontaneity, insight, and reflection (Orr, 2001, p. 8).

Much of this chapter's focus is on learning and the experience of students, which may initially seem curious for a study of adults engaged in sustainability education. However, the success stories concerning particular sustainability-pioneering or 'übergreen' schools that emerge from much of the literature suggest that innovation in this field is thoroughly grounded in the experience of the school's students. Indeed, this observation is reflected in the recent shift of language towards discussing 'sustainability learning'. An additional point is that, as many of the study participants indicated in their responses to questions about connection to nature in particular (as will be detailed in Chapters 6 and 7), formative childhood experiences have a profound influence on motivation in the adult present. Thus, it seems appropriate to follow this lead in further examining learner- or child-oriented researches, such as the writings of Edith Cobb on the shaping influence of nature, the work of Gregory Bateson on systems thinking and

“the pattern which connects”, or David Orr’s ongoing exploration of the power for young students of direct experience in nature. Ultimately, a key part of answering the study’s core question, *What are the qualities of the sustainability perspectives of adults engaged in a whole-school sustainability program?*, would be an imaginative engagement with students’ own experience. As the responses of several participants repeatedly show, in some perspectives this engagement leads naturally to the desire to see students take a leading role in their own sustainability learning, as well as to the recognition that a profound shift in thinking – for educator and learner alike – is, or ought to be, integral to successful sustainability learning. Finally, a message that emerges between the lines of the literature surveyed in this chapter also becomes a topic of exploration toward the end of the thesis: the central importance, particularly in the more fully expressed sustainability perspectives, of fostering individual sovereignty.

Framing the Learning Context

The body of this chapter comprises four major sections. This first section provides the necessary background to the remaining three sections, which are titled “The Sense of Wonder”, “Thinking” and “From Thinking to Action”. The background topics discussed here include: valuing less protocol-based approaches to sustainability learning program design and implementation, the importance and use of the language of ESD, and a way of perceiving the world through a sense of love rather than environmental loss for individuals. Throughout the remainder of this thesis these issues emerge repeatedly, as indicated in various contexts. The following words of Lao-tzu have been useful to me as a guide through this thesis, and are included here as a reminder of the value of different approaches to supporting learning, particularly less protocol-based ones, where the mode is determined given the unique conditions faced:

The ancient Masters
didn't try to educate the people,
but kindly taught them to not-know.

When they think that they know the answers,
people are difficult to guide.
When they know that they don't know,
people can find their own way... (Lao-tzu, trans. 2006).

Valuing Less Protocol-Based Approaches

In almost all of what follows in this chapter's major sections, a key aspect will be the approach taken to the implementation and practice of ESD. There continues a strong trend in the area of ESD, in place since its outset, to seek and apply a transferable protocol. Such protocols might be applied at the scale of the individual regarding environmental attitudes and behaviour change, as well as to that of systems, in curriculum and school change. In 1969, the American educator William Stapp and his colleagues first outlined "The Concept of Environmental Education" (Stapp et al., 1969). The following year, an early version of what may be seen as a protocol-based approach appeared with a strategy for curriculum development and implementation (Stapp, 1970), which was followed by later pedagogical models (Stapp et al., 1996). More recent years have seen work in North America appearing in a similar style (Ernst & Theimer, 2011; Monroe, 2003; Zelezny, 1999), as well as in Europe and the antipodes (Bjorneloo & Nyberg, 2007; Breiting, Mayer & Mogensen, 2005; Elliott, 1999; Fien, 2003; Filho, 1996; Payne & Wattachow, 2009). Significant learning is available from discussing best practices attained from both unique and more generalizable conditions.

My own experience in the course of conducting and analyzing this study has been one of transition and shifting the balance towards the unique. To place this in context, one may envisage a spectrum of approaches to best practice, ranging from formulae valued for their portability, through flexible implementation of a given set of program specifics, to a style that is largely based on the interaction between the particular conditions experienced by an individual

and their own sustainability perspective. It is this last emphasis that most closely aligns with the term ‘sustainability chef’, and which emerges with surprising consistency through the responses of the study’s participants. Indeed, valuing Lao-tzu’s stance of ‘not knowing’ might be seen as a theme not only in this thesis but also in the work of others, such as American sustainability educators Michael Stone and Zenobia Barlow, who state: “In the course of our work, it has become clear that there is no one-size-fits-all ‘sustainability curriculum’; thus, the projects described in this book often don’t yield explicit step-by-step directions for replicating them in others settings” (Stone & Barlow, 2005, p. 6).

The link between a more fluid, responsive style of engagement with sustainability curriculum outlined by Stone and Barlow and its counterpart relating to environmental issues is discussed in *The Ingenuity Gap* (Homer-Dixon, 2000). Some of the most serious environmental issues, such as climate change, contain within them what Homer-Dixon terms ‘unknown unknowns’: “Not only are we often ignorant of critical components, processes, and possibilities in the complex systems surrounding us, we’re often ignorant of our ignorance.... We often don’t know what we don’t know” (Homer-Dixon, 2000, pp.172–173). Given this, responses in the realm of learning must be framed with a high degree of adaptability and resilience in order to be relevant both to the unique conditions faced and to the inevitable and unpredictable ensuing changes. Such learning conditions are arguably outside the scope of a generalized protocol.

The value placed on not knowing is sourced from two dimensions of this thesis: the research context as well as the participant findings. Firstly, as mentioned above, the issues of sustainability and sustainable development that are so closely related to ESD have been shown by many researchers to have entered an era of unknown and unknowable impacts. Chapter 2 explores in some detail this case with respect to both the environment and the economy, with evidence provided by experts in their various fields (see for example Costanza & Daly, 1987; IPCC, 2007; D.H. Meadows, Randers & D.L. Meadows, 2004; Stern, 2006). Secondly, many of

the findings of this thesis emerge empirically from the participants in three nations and reveal a manner of sustainability learning that relates less to protocols and more to an individual's approach or sustainability framework, which I frame via the metaphor of a sustainability chef. As Scottish philosopher David Hume said, "He is happy, whose circumstances suit his temper; but he is more excellent, who can suit his temper to any circumstances" (Hume, 1752/n.d., § 6.9). A non-protocol-based approach is embedded in the term 'sustainability chef', chosen for its affinity to the classic French chef who uses the tools and conditions to hand (adaptable techniques and seasonal market produce) for the basis of the meal being prepared. The remaining sections of this chapter detail qualities other researchers have touched on that are found in a sustainability chef: a sense of wonder, aspects of thinking that might be termed sustainability cognition, and engagement in sustainability learning, much of which infuses the results section of this thesis (Chapters 5 through 8). The American meditation teacher Jack Kornfield shares a relevant instruction from a Korean Zen master as he was relating the wisdom of not knowing to his students: "'Now keep this don't know mind!' he will say. Rest in it, trust it. As with the Cloud of Unknowing ... wisdom grows by opening to the truth of not knowing" (Kornfield, 2001, p. 288). Shunryū Suzuki also pointed out, "In the beginner's mind there are many possibilities; in the expert's mind there are few" (Suzuki, 1970/2010, p. 2). Not knowing therefore imbues both sides of the problem-solution dyad of environmental problems and the role of learning in their solution.

Meaning Through Language

While the voices at the core of the study belong to its participants, another set of voices are also integral to this thesis: those from the associated literature. As ESD is a relatively new and emerging field, the language used has a bearing on shaping the field in moving forward. Moreover, as a group of Canadian researchers point out, the term ESD itself is open to multiple

interpretations: “The three component words education, sustainable, and development are in themselves separate concepts with no universal meaning” (Nazir, Pedretti, Wallace, Montemurro & Inwood, 2011, p. 373). Within the more broadly delineated area of teaching and learning about sustainability and the environment, a consensus over what the area itself should even be called has proved problematic and continues to be elusive, with terms such as environmental education, ESD and learning for sustainability proliferating. For all these reasons, a brief discussion of meaning and language forms a necessary part of the background to this chapter.

Not only does the definition of ESD tend to depend on who is defining it and their intended emphasis, but various similar terms and abbreviations have proliferated, such as education for sustainability (EFS), sustainability education, learning for sustainability, or the following that appears on a United Nations (UN) website, “SD-Learning: reaching sustainable development through knowledge” (UNCSD, 2012). A sample of the various relevant terms in active use can be found in the comprehensive five-volume series, *A National Review of Environmental Education and its Contribution to Sustainability*, published in 2005 by the Australian Research Institute in Education for Sustainability (ARIES). The first volume, *Frameworks for Sustainability*, includes definitions of terms related to this field, such as “education *about* the environment”, “education *in* the environment” and “education *for* the environment”, as well as “environmental education” and “learning for sustainability” (emphasis in the original; Tilbury & Cooke, 2005, pp. 112–115).

Interestingly, the ARIES glossary does not actually include the term ESD, although it does include a heading for the United Nations Decade of Education for Sustainable Development (UN DESD). In her 2005 publication “Currents in Environmental Education”, Lucie Sauvé charts 15 strands of influence on environmental education. Under the sustainability current she notes that in the transitioning of the United Nations programs from the International Environmental Education Program (1975–1995) to that of Educating for a Sustainable Future

(UNESCO, 1997), “Environmental education thus becomes one tool among others in the cause of sustainable development”, which itself gives rise to concomitant problematic issues (Sauvé, 2005, pp. 30–31). Aspects of the problematic issues around the language of ESD arise when the term is translated into other languages. In Lithuanian, ESD is “švietimas darniam vystymuisi”, which includes within its translation the notion of balanced development; in French it is “l’éducation au développement durable”, with the notion of the enduring being emphasized. As outlined at the outset of the next chapter, the term ‘sustainable development’ is itself problematic, given the varied emphases possible regarding the word development for protecting or exploiting the environment. In a later publication, the point is made that with the UN DESD, “it becomes ever more crucial to reflect upon and investigate the integration of environmental education as ‘environment-related education’ into school curricula and into non-formal educational initiatives and programs in the various regions and countries of the world” (Sauve, Berryman & Brunelle, 2007, p. 50). ARIES relates the following regarding learning for sustainability:

Learning for sustainability has crystallized as a result of international agreements and the global call to actively pursue sustainable development. It provides a new orientation for current practice in Environmental Education. This new orientation attempts to move beyond education *in* and *about* the environment approaches to focus on equipping learners with the necessary skills to be able to take positive action to address a range of sustainability issues. Learning for sustainability motivates, equips and involves individuals, and social groups in reflecting on how we currently live and work, in making informed decisions and creating ways to work towards a more sustainable world. Underpinned by the principles of critical theory, learning for sustainability aims to go beyond individual behaviour change and seeks to engage and empower people to implement systemic changes (emphasis in the original; Tilbury & Cooke, 2005, p. 115).

In this thesis, the terms ESD, sustainability education and sustainability learning will be used, often interchangeably, alongside one I found myself having to use for translation reasons while on my research trip: education for a liveable future. I define a liveable future as one with living and non-living entities in a healthy state of dynamic equilibrium. In many ways my own

beliefs regarding the terminology of the field align with a sentiment expressed in 1969 by Wilson Clark regarding the two predecessors of ESD, conservation and environmental education: “The latter term is now in vogue. It’s all right with me. I care not one bit what handle we give to the concept. I do care how we go about the job” (Clark, 1969, p. 8).

Meanings of the common terms, such as ESD, EFS and sustainability education, are hotly debated, along with their similarity to or divergences from what came before in the conservation movement and in environmental education (EE). At times, EE and ESD are conflated and terminology confusion can abound. Indeed, there are researchers who actively use both terms, perhaps for a wider draw for their arguments. While some suggest that sustainability education harks back to environmental education, its elder cousin, others take the term ‘sustainability education’ to name their institution, and the work they do is anything but backward-looking. In fact, much of the friction in the debate is largely a symptom of a young field that is still shaping itself and so actively engaged in basic definitional issues. British environmental education researchers William Scott and Stephen Gough send an injunction to their colleagues, given that “it might be argued that a field incapable of establishing agreed definitions of its most basic terminology is unlikely to make any other sort of progress” (Scott & Gough, 2003, p. 110).

One way of considering the progression of terms that relate to the field of sustainability learning as they have emerged is to see them as a series of shifting perspectives, where the view that arises is often longer, wider, deeper, more dynamic or expresses aspects of these qualities. This trend can be seen not only in the proliferation of terms used to describe ESD, but also in the preceding forms of education. Comparing two of the different perspectives at a time can be useful. After attending the annual meeting of the North American Association for Environmental Education in Buffalo in early October 2010, I tried to express the differing stances which might broadly be termed that of the environmental educators versus the ESD educators regarding both how they think of themselves as well as how they think of their

colleagues in the other grouping. I developed the figure below to show that the styles have similar building blocks: they acknowledge the importance of the environment, economy, society and their interactions, yet differ in their priorities.

Figure 2. Comparing EE and ESD perspectives.

The left part of Figure 2 shows the “EE Perspective”, with the EE region of concern mostly being the environmental sphere. From this stance, ESD is seen as a subset interest that has as its focus the interaction between the environment and economy. The right part of the image, the “ESD Perspective”, shows the larger region of concern held by ESD to include all three spheres (as discussed in Chapter 2), a perspective shared by various participants in this study (see Chapter 6). From this stance, EE could be seen as a subset with a dominant focus on the environmental sphere, partially arising from the interactions of society’s interest in the environment. Thus, comparing the two images in this figure suggests a broadening perspective.

In conclusion, the area within which this study, its participants, and the academic community are located continues to evolve, and to do so in a way that resists a simple interpretation. This state of affairs is clearly more problematic, as well as perhaps more fruitful,

for the detail-oriented researcher than for the school-based practitioner; yet its implications are of considerable relevance to both communities, particularly if the gap that sometimes manifests between them is to be successfully bridged. One aim of my own research is to be a part of such a bridge.

Perceiving the World Through Love, Not Loss

What is of primary importance to an individual engaged in ESD in a role such as offered by the EcoSchools program? What have contributors to the literature expressed regarding the basic value of environmental teaching and learning? As may quite clearly be heard in both sets of voices, to teach or write about the environment is to care about it; and to care about our world in an environmentally sensitive way is to be engaged at a personal level in a struggle between hope and despair. Exploring this dynamic is therefore a key piece of context for what follows, both in this chapter as well as throughout the thesis.

The story of ESD has to a great extent focused on finding the means of supporting individuals to take action, either through suggested action or through language and dialogue, on the assumption that improved knowledge would lead more directly to right action. In this thesis, the case is made that there are precursors to action, not just of knowledge, but significantly of a sense of connection to the environment. Achieving the result of an improved state of the environment and a liveable future then becomes a journey involving three aspects, moving through what is both a sequential and simultaneous flow from connection, to interpretation (or knowledge), to engagement (or action). This section has as its focus a discussion of the dimensions of interpretation and connection in shaping a liveable future.

If the assumption concerning individuals' inactivity regarding environmental issues is that they have lacked basic information regarding the state of the environment, Chapter 2 illustrates the extent to which information has been available regarding human impact on the

environment over the course of half a century. Researchers from many disciplines (Brown, 2002; Costanza et al., 1997; Daly, 1990; Ehrlich, 1968/1971; Emerson et al., 2012; D.H. Meadows, Randers, D.L. Meadows & Behrens, 1972; Postel, Daily & Ehrlich, 1996) have illustrated the depth and breadth of environmental difficulties yet remain puzzled by what sometimes appears as apathy in some sectors of the public. One explanation may be that rather than understanding the situation poorly, individuals have taken it to heart all too well. The response to Al Gore's publication, *An Inconvenient Truth* (Gore, 2006), which so clearly outlines evidence of climate change but leaves evidence of positive change and a hopeful discussion of the future to the final portion of his book, has resulted to some extent in what the German parliamentarian Hermann Scheer refers to as a "no future mentality" (Scheer, 2007, p. 218). The response to *Agenda 21*, the outcome document from the Earth Summit in Rio de Janeiro in 1992 that was for and by children, *Agenda 21: Rescue Mission: Planet Earth*, includes poems about death and images that are overwhelmingly black (UNESCO, 1994).

Responding to what appears as an ominous, inexorable reality, the public may have been poleaxed by anger, fear or despair, while some have likely taken refuge in denial. For some, the loss of aspects of the environment equates to the tragedy of a lifetime, similar to other experienced tragedies such as the death of a family member. Interestingly, Gore explicitly discusses the loss of his beloved sister Nancy to lung cancer as a result of her smoking tobacco from the age of 13, a product his own family had farmed for years in Tennessee. He links the tragedies brought on by cigarettes with the tragedies brought on by global warming as he states:

The implications of continuing to grow a crop on my father's farm that helped produce the cigarettes that had caused her fatal disease seemed a little abstract and a little remote at that point – in the same way that global warming seems remote to many right now.... Just as the scientists of 1964 clearly told us that smoking kills people by causing lung cancer and other diseases, the best scientists of the 21st century are telling us ever more urgently that the global warming pollution we're pumping into Earth's atmosphere is harming the planet's climate and putting the future of human civilization at grave risk. And once again, we are taking our time – too much time – in connecting the dots (Gore, 2006, p. 259).

Gore relates a final exchange with Nancy, where a question hung in the air between the siblings: “Do you bring hope?” (Gore, 2006, p. 258). Indeed, hope is a powerful factor in moving through and ultimately out of the cycle of grief.

It was the Swiss American psychiatrist Elizabeth Kübler-Ross who proposed five discrete stages of grief in response to death, tragedy, or significant life stress (Kübler-Ross, 1969/2003). Although non-sequential, the five stages of grief she identified are denial, anger, bargaining, depression and acceptance. She proposed that individuals experience two or more stages and as circumstances change to alleviate the situation, the stages of grief are curtailed. The present state of the environment, its complexities of function, the problems and solutions to crises globally, and our relationship with all these factors are so challenging as to have the power to induce a serious stress response in individuals, with many remaining embroiled in the maelstrom of the first four stages without arriving at the final stage of acceptance. Kübler-Ross depicted the stages of grief rather sequentially (see her diagram, Kübler-Ross, 1969/2003, p. 265). However, given Kübler-Ross’s point that not every individual experiences all five states, yet any mind state in the cycle of grief may give rise to any other mind state, I designed the figure below to underscore the interconnections among mind states as well as their fluid, transient nature. The drivers behind the double-headed arrows are likely to be personally determined, a point of importance for any individual moving towards acceptance.

Figure 3. Relationships among stages in the cycle of grief.

Here, acceptance does not imply passivity, but rather a state attuned to reality, where authentic engagement may take place. The relevance of the work of Kübler-Ross to this thesis is that at points the participants discuss feelings of anger or despair (see portraits of CA-Teach4 and CA-Admin1 in Chapter 7) but they also discuss the means by which they have been enabled to take action to shape a liveable future through choices in both the private and public spheres of their lives. As described in the results chapters, participants' primary means of moving from an overwhelmed state into a state of engaging with solutions to environmental problems seems to be through a sense of connection, both connection *to* (the environment) and connection *with* (concepts). Three words appear repeatedly in both the literature and the participants' responses regarding connection as a basis for authentic engagement: hope, love, and compassion (see Chapters 6 and 7).

The role of hope for individuals facing difficult circumstances cannot be overstated, as portrayed in the sibling exchange Gore described above. Hope has the power to shift a perspective of despair towards equanimity, echoing the phrase that Bryn Austin Rees wrote in 1973, "hope is awakened in the place of despair" (<http://www.hymnary.org/>). Indeed, Kübler-Ross herself suggests that "The one thing that usually persists through all these stages is hope"

(Kübler-Ross, 1969/2003, p. 148). The American meditation teacher Sharon Salzberg points out that benefits of strengthening one mind state, such as equanimity, are derived through shifting the nature of other transient mind states, thereby bringing about a more developed sense of patience, courage and interconnection (Salzberg, 2004). David Orr points out that “Hope, authentic hope, can be found only in our capacity to discern the truth about our situation and ourselves and summon the fortitude to act accordingly” (Orr, 2007, p. 1395). Love discussed in this thesis is not romantic love but an abiding love for nature or topophilia: a theme that figures strongly in study participants’ responses relating to connection. The scientists who wrote *Limits to Growth* cite the importance of love:

The message [of *The 30-Year Update*] is that if we persist in our pedagogic effort, the world’s people will increasingly choose the right way ahead, out of love and respect for their planetary companions, current and future, human and nonhuman. We fervently hope they will do so in time (Meadows et al., 2004, p. xvii).

Others may use the term care rather than love, as used to describe the Sustainable Schools Strategy by the UK’s Department for Education and Skills (DfES): “We believe [a sustainable school] is one that is guided by the principle of care: care for oneself, care for each other (across cultures, distances and time); care for the environment (far and near)” (DfES, 2006b, p. 4). The American philosopher and meditation teacher Joseph Goldstein points out that “The word ‘compassion’ contains and expresses feelings of openness, caring, and interconnectedness” (Goldstein, 2002, p. 123). Two of the participants’ portraits in Chapter 7 touch on the importance of compassion:

I look at – at least at the high school level – trying to produce citizens that are environmentally aware and have some sort of compassion for the environment, for ecology and recognize our spot within it, that we’re part of it, not separate from it (CA-Teach4, p. 1).

Compassion really is that whole multi-stakeholder viewpoint. It’s understanding there are different viewpoints, and you’re going to come up against this. So don’t

be so self-righteous when you go and start this problem-solving. It's really understanding human nature (CA-Coord, p. 33).

Goldstein goes further to point out that compassion is not passive:

it also contains within it a strong motivation to act. Thich Nhat Hanh expressed this perfectly when he said, "*Compassion is a verb.*" As we develop ... compassionate action, we begin to practice an active engagement with suffering in the world, responding to the various needs of beings in whatever way is appropriate and possible (emphasis in the original; Goldstein, 2002, p. 124).

It is therefore through hope, love and compassion that individuals develop a living responsiveness to the conditions they face in shaping a liveable future.

The IUCN CEC has initiated a campaign that speaks to this very shift in moving from information that may induce states of despair, fear or anger towards a stance of authentic engagement: "Love. Not Loss." They invite individuals to participate in the campaign and "to learn how to tell a love story" (IUCN, n.d. a). This is not about fantasy, acting as if there are no environmental problems, but rather about shifting emphasis. Their point is that

The best way to rekindle a lost love is not to talk about what went wrong – extinction, habitat loss or resource scarcity. It's to remember what we loved in the first place.... If you want a happy ending for nature and people, it has to be a love story. Personalize. Humanize (IUCN, n.d. b).

One way of reading the lived experiences of ESD described in this chapter, also valid as a way of reading this thesis, is to perceive the love story that it represents for me, for the researchers cited, for those participants who shared their views, and possibly for the reader as well.

The Sense of Wonder

Rachel Carson's final book, *The Sense of Wonder*, was published posthumously in 1965, but it is a republication of an essay, "Help Your Child to Wonder", that first appeared in July 1956, in *Women's Home Companion*. The text of the book's first edition is accompanied by many photos, a number of which were taken near her home on the Maine coast. The book is imbued with Carson's experiencing of her beloved woods and shoreline with her grand-nephew,

Roger Christie, at various points from the time he was an infant to a boy of 4. Although its message resonates at a larger scale, it might be seen as a guide for adults spending time with children outdoors, reflecting something in the style of guidance between tutor and student in Rousseau's 1762 treatise, *Émile, ou de l'Éducation* (1762/1979). Carson's final book is dedicated to Roger and the fresh perspective of a very young child, the "child's inborn sense of wonder" referred to on the cover, is felt throughout it.

An important characteristic of what Carson terms a sense of wonder is that it is innate and so precedes everything else; it comes before schooling, education, or even learning arising in the various educational contexts of the formal, non-formal or informal. The essence of Carson's sense of wonder has also been the focus for other researchers, notably by the Harvard entomologist Edward O. Wilson in his 1984 publication, *Biophilia*, along with his collaborative work with Yale social ecologist Stephen Kellert and others on *The Biophilia Hypothesis* (1993). They hold that biophilia, or our need to affiliate with other species, is encoded in our genetic makeup. From a more psychological perspective, Edith Cobb published "The Ecology of Imagination in Childhood" in 1959 as a work in progress in *Daedalus*, the Journal of the American Academy of Arts and Sciences, three years after Carson's initial article appeared. She describes her thinking:

My position is based upon the fact that the study of the child in nature, culture, and society ... reveals that there is a special period ... when the natural world is experienced in some highly evocative way, producing in the child a sense of some profound continuity with natural processes and presenting overt evidence of a biological basis of intuition (Cobb, 1959, p. 538).

The child's sense of which Cobb speaks was developed in her book of the same title published the year of her death in 1977; it included a phrase that did not appear in the earlier publication: a sense of wonder. Cobb describes a sense of wonder in the following way:

The child's sense of wonder, displayed as surprise and joy, is aroused as a response to the mystery of [the] stimulus [of nature] that promises "more to

come” or, better still, “more to do” – the power of perceptual participation in the known and unknown (Cobb, 1977, p. 28).

While Carson’s own writing about the sense of wonder was intended for an audience outside the academy, her expression of it being fundamental for every individual regardless of age is clear when she states:

I sincerely believe that ... it is not half so important to *know* as to *feel*. If facts are the seeds that later produce knowledge and wisdom, then the emotions and the impressions of the senses are the fertile soil in which the seeds must grow.... Once the emotions have been aroused – a sense of the beautiful, the excitement of the new and the unknown, a feeling of sympathy, pity, admiration or love – then we wish for knowledge about the object of our emotional response. Once found, it has lasting meaning (emphasis in the original; Carson, 1965, p. 45).

Here she points out that the precursor to knowledge is this ability to feel, worthy of both being attuned to from early days and fostering throughout life.

An article by the 19th-century British essayist William Hazlitt, “On the Love of the Country”, appeared in *The Examiner* on November 27, 1814, and expressed sentiments similar to those raised by Carson. His view is that we love nature “because natural objects have been associated with the sports of our childhood ... [it is] because they have been one chief source and nourishment of our feelings, and a part of our being, that we love them as we do ourselves” (Hazlitt, 1814/1930, p. 4). He also suggested a transferability of feelings regarding nature: “...if I have once associated strong feelings of delight with the objects of natural scenery, the tie becomes indissoluble, and I shall ever feel the same attachment to other objects of the same sort” (Hazlitt, 1814/1930, p. 5). Whether our love of nature reflects an innate connection to it or the lasting influence of happy childhood experiences, both Hazlitt and Carson agree on the enduring nature of this bond.

The same year as the first international Earth Summit of the United Nations, at which the term ‘education for sustainable development’ came into common parlance, the American environmental educator David Orr published *Ecological Literacy: Education and the Transition*

to a Postmodern World (Orr, 1992). The publication emerging from the Earth Summit, *Agenda 21*, outlined three programme areas in Chapter 36 of Section IV: “Means of Implementation”, the first of which was “reorienting education towards sustainable development”. The other two goals in the education chapter of increasing public awareness and promoting training are also reflected in the chapter title of “Promoting education, public education and training”. Regarding the basis for action for both formal and non-formal education, it is stated that they are “critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making” (UNCED, 1992, Chapter 36, p. 1). While the individuals at the United Nations conference were outlining definitional issues, Orr developed important details. In *Ecological Literacy*, he shares his views regarding the agenda for developing ecologically literate individuals. One of the three main sections of the book is on education itself, with Chapter 5 also titled “Ecological Literacy”, and Chapter 7 listing the details for “A Syllabus for Ecological Literacy”. He explains the purpose of the education section:

[it has] to do with the question of what the limits of earth have to do with the content and process of education and with the way we define knowledge.... Sustainability ... requires a different kind of curriculum that encourages the development of ecological competence throughout the population.... The goal of ecological competence implies a *different* kind of education and a different kind of educational experience that develops the practical art of living well in particular places (emphasis added; Orr, 1992, p. 84).

The implication is that sustainability education must be more than a “drop-in” to traditional schooling, like a borrowed recipe for a French dessert to follow a standard roast beef dinner, but rather requires a fresh approach to pedagogical cuisine.

Examples of programs and schools in the United Kingdom and North America that currently engage with and support this type of competence will be outlined in a later section of this chapter. However, at the point in time when he was outlining what he viewed to be an ecologically literate individual and what a required syllabus would look like, Orr was certainly

considered to be a pioneer in the field. Three years after the publication of *Ecological Literacy*, the Center for Ecoliteracy, a leader in the green school movement, was founded in 1995 in Berkeley, California. Orr sits on the Center's board, along with other environmentalists and philosophers, notably Zenobia Barlow and Fritjof Capra. A decade after it was founded, the Center produced *Ecological Literacy: Educating Our Children for a Sustainable World*. This book, divided into four parts covering the aspects of Vision, Tradition/Place, Relationship and Action, includes a diversity of essays by well-known sustainability practitioners, such as Alice Waters, organic restaurateur and proponent of the "Delicious Revolution" and Wendell Berry, farmer, activist and author of *The Gift of Good Land*, as well as Barlow, Capra and Orr. The introduction to the first of two essays by Orr amounts to a dedication: "[Orr's] 1992 book *Ecological Literacy* ... and the ideas expressed in it are the source of the Center's name and the inspiration for many of its core practices, especially the centrality of education grounded in place" (Stone & Barlow, 2005, p. 85).

The introduction to the book's only photographic essay is an excerpt from "A Sense of Wonder", an essay Orr wrote around 2004 that is posted on the "Explore" part of the Center for Ecoliteracy's website. In it, he expresses his belief that this type of education "is the reconnection of young people with their own habitats and communities.... We need it, first, to help open young minds to the awareness of the forgotten connections between people, places, and nature" (Orr, n.d.). He concludes his essay by citing others and the expression they use regarding one of the most significant aspects of this type of education: a magical quality, or what English novelist E.M. Forster expressed as that which "lies nearer to the unseen" (Forster, 1910/1989, p. 44). Working with the unseen does require skill, described in Hebrews 11:1 of the New Testament of the 1611 King James Bible as follows: "Now faith is the substance of things hoped for, the evidence of things not seen" (<http://www.kingjamesbibleonline.org>). Orr's essay concludes:

D.H. Lawrence once said that “Water is H₂O, hydrogen two parts, oxygen one, but there is also a third thing that makes it water and nobody knows what it is.” It is magic, the kind that can only be found in nature, life, and human possibilities once we are open to them. The kind of education I have in mind takes young people out of the classroom to encounter the mystery of the third thing. In that encounter they discover what Rachel Carson once called the “sense of wonder.” And that is the start of a real education (Orr, n.d.).

This third thing that Orr refers to may be associated with emergence, touched on as an aspect within the cycle of emergence, resilience and sustainability discussed in the previous chapter.

The real education of which Orr speaks has sprung to life and is taking place in and out of schools globally.

Jon Kabat-Zinn’s 2005 publication *Coming to Our Senses: Healing Ourselves and the World Through Mindfulness* describes a manner of paying attention to ourselves and the world in a way that is resonant of Carson’s descriptions. He suggests that

The first step on the adventure involved in coming to our senses on any and every level is the cultivation of a particular kind of awareness known as *mindfulness*.... It is just about paying attention in your life as if it really mattered ... not just for ourselves, but for the world (emphasis in the original; Kabat-Zinn, 2005, p. 11).

Carson also describes using all of the senses as a means of being open to the reality of our surroundings: “Exploring nature ... is largely a matter of becoming receptive to what lies all around you. It is learning again to use your eyes, ears, nostrils and finger tips, opening up the disused channels of sensory impression” (Carson, 1965, p. 52). This echoes 18th-century philosopher Bishop Berkeley’s statement on the importance of being perceived, “*esse est percipi*”, or “to be is to be perceived” (<http://www.britannica.com>). Berkeley resolved the apparent paradox implicit in his statement through an appeal to a deeper spiritual reality. The cultivation of an ability to be alive in spirit is a common tie among many authors, whether those mentioned here, or others such as those collected by Roger Gottlieb in the anthology *This Sacred Earth*.

Poignantly, Carson also describes that the legacy she would like to leave would include this sense of wonder as a gift for each individual:

If I had influence with the good fairy who is supposed to preside over the christening of all children I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength (Carson, 1965, pp. 42–43).

Carson's writing exudes the expansive beauty of natural habitats and the ease of connecting with them, yet she does not fail to make the point that this sense of wonder is available to every individual, regardless of the context in which they live. In urban areas, for instance, if the scale of nature is diminutive, the sense of wonder need not be. She suggests that

Even if you are a city dweller, you can find some place, perhaps a park or a golf course, where you can observe the mysterious migrations of the birds and the changing seasons.... [Y]ou can ponder the mystery of a growing seed, even if it be only one planted in a pot of earth in the kitchen window (Carson, 1965, p. 49).

Although Carson's comments relate to connecting to small versions of nature within an urban environment, in fact, every aspect of a city is ultimately sourced from and associated with the natural environment at the interface of the air, water and earth. Such reflections would be highly relevant to the majority of the participants in the present study, those whose schools are sited in urban or suburban locales.

An urban environment is in fact a natural environment and a source for a sense of wonder, a fact known long before Carson wrote her book. William Wordsworth and his sister Dorothy experienced this on the morning of 3 September, 1802, as their coach travelling from England to France passed over a bridge in London. Although they had spent much of their lives embraced by the beauty of England's Lake District, Wordsworth was awake and open to the beauty of his surroundings, even in the context of a large city. The bright morning light on the built environment was so striking it led him to write the poem "Composed upon Westminster Bridge", giving voice to urban topophilia.

Earth has not any thing to show more fair ...
This City now doth, like a garment, wear
The beauty of the morning ... (Wordsworth, 1807, p. 118).

Part of the legacy of great poets such as Wordsworth and writers such as Carson rests in their own skill of seeing and ability to share this vision of the world. Carson brings *The Sense of Wonder* to a close by showing the extent to which one of her correspondents, a woman in her eighty-ninth year, made use of this vision. This letter

bore eloquent testimony to the lifelong durability of a sense of wonder.... [She] explor[ed] that world that is old but ever new.... The lasting pleasures of contact with the natural world are not reserved for scientists but are available to anyone who will place himself under the influence of earth, sea and sky and their amazing life (Carson, 1965, p. 95).

Fostering a sense of wonder in self and others is an integral aspect of sustainability education and a fundamental aspect of the joy of being an educator, as expressed by CA-Admin1, whose portrait appears in Chapter 7:

One of the highlights of my childhood was coming up at May 24th weekend and the water would just be swarming with big bass.... And I can't remember exactly when I noticed the first time I went up to the cottage in the spring and there were no bass nests.... It's something that's very important to me. And also because I'm a parent and I want my son's children to see bass babies, bass hatchlings out there some day, but I don't know if that's going to happen (CA-Admin1, p. 3).

Carson's writing was informed by her interest in the work of Albert Schweitzer, to whom she dedicated *Silent Spring*. She was particularly moved by his detailing of an ethic whereby a reverence for life and understanding of the interdependence of living things would be accompanied by an impulse for action. Writers commonly describe reciprocity of presence and its implications within spiritual traditions, as Thich Nhat Hanh does in *Interbeing* (1993). Hanh points out, "The future of the Earth and our children depends on the way we live today.... [T]he true nature of interbeing – we cannot just be by ourselves alone; we can only inter-be with everyone and everything else" (Hanh, 1993, p. 48). An acceptance of this view shapes the action

an individual might engage with, as the natural response to living in a world where individuals exist within a web of interconnections to living and non-living aspects of the world.

At the outset of the introduction to a collection of essays about the impact of nature on individuals, David Suzuki reminds us of the weaving together of connection, understanding and action: “Throughout history, every society has known that we are deeply embedded in and dependent on nature. People have understood that everything is connected to everything else and that therefore every action or inaction has consequences” (Suzuki, 2002, p. 1). Kabat-Zinn also gives voice to much the same concept, saying:

But one thing is certain: This is a journey that we are all on, everybody on the planet, whether we like it or not; whether we know it or not; whether it is unfolding according to plan or not. Life is what it is about, and the challenge of living it as if it really mattered.... [W]e can be fairly insensitive to the ways our lives actually impinge upon and shape the world and the ways in which the world shapes our lives in a symbiotic dance of reciprocity and interdependence on every level (Kabat-Zinn, 2005, pp. 2–3).

Life *is* what it is about, and if a sense of wonder is innate, like our senses that enable us to be aware of perceptions, then perhaps a core aspect of pedagogy would be less a coming to and more a returning to our senses. When describing this in “A Sense of Wonder”, David Orr suggests that “it is more akin to a homecoming” (Orr, n.d.).

Heesoon Bai suggested that part of the source of environmental problems as well as their solution can be found in education and pedagogy. In her article, “Beyond the Educated Mind: Towards a Pedagogy of Mindfulness”, Bai explains that a pedagogy of mindfulness has as its focus percepts, or the entities that make up our environment as they present themselves to our senses, rather than concepts, the removed mental constructs of those entities. This pedagogy is “fit to address not only the pedagogical problem of translating knowledge into action, but also the more substantive task of healing human alienation from the world” (Bai, 2001, p. 88). The sense of alienation humans have from the world results from the double failure of not connecting

to the Earth and not connecting the consequences of appropriate action to observable results, both of which shift with an awareness of percepts.

Bai's identification that an emphasis on the transmission of abstract concepts in education is at the root of environmental problems and requires a shift towards percepts is reminiscent of Alfred North Whitehead's warning regarding the role of inert ideas in education more than seventy years before. Whitehead, a Trinity College, Cambridge-educated British mathematician and philosopher, suggested that a style of education that would remain in the abstract or theoretical realm for students, rather than in the experiential, includes inert ideas and should be avoided. His warning is as strong as possible, appearing at the beginning of *The Aims of Education*: "above all things we must beware of what I will call 'inert ideas'" (Whitehead, 1929/1967, p. 1). Inert ideas fail to engage individuals on an internal level and so, inevitably, fail to engage individuals on any other more pragmatic levels. Whitehead's writing as a sexagenarian exemplifies the active. Describing a world far from inert ideas, his view is that education "preserves the connection between knowledge and the zest of life.... This atmosphere of excitement, arising from imaginative consideration, transforms knowledge.... The task ... is to weld together imagination and experience" (Whitehead, 1929/1967, p. 93). He points out that "...the adventure of life cannot be disjoined from intellectual adventure" (Whitehead, 1929/1967, p. 94). Ideas shared with students need to be absolutely fresh and relevant, as illustrated by this unusual image:

Knowledge does not keep any better than fish. You may be dealing with knowledge of the old species, with some old truth; but somehow or other it must come to the students, as it were, just drawn out of the sea and with the freshness of its immediate importance (Whitehead, 1929/1967, p. 98).

His words are spiced with the adventure of ideas, coming alive from the thrill of experience guided by imagination.

Chapter 7 of *The Aims of Education* largely consists of what first appeared as an essay, “Universities and Their Function”, in *The Atlantic Monthly* in 1928. Although universities in general and business schools specifically are the focus of this chapter, his comments apply to the wider domain of institutions of learning. He suggests that “...the proper function of a[n] [institution of learning] is the imaginative acquisition of knowledge” (Whitehead, 1929/1967, p. 96). The chapter contains hints of what would become his doctrine of connectedness. In detailing what a particular learning organization needs to be aware of and the variety of skills required of its members, a lengthy paragraph contains no less than ten descriptions of a particular style of thinking. These include “intellectual adventure”, “imaginative reconstruction”, “imaginative grasp”, “imaginative vision”, and “imaginative understanding”. It is unsurprising that a major thrust of Whitehead’s guidance for a learning organization would be in the style of perception and thinking about the world in such a dynamic way. This style of thinking acknowledges choices and interconnections:

It requires an imaginative grasp of the interlocking interests ... of the reactions of the whole complex to any change in one of its elements. It requires an imaginative understanding of laws of political economy, not merely in the abstract, but also with the power to construe them in terms of the particular circumstances.... It requires that discipline of character which can say “yes” and “no” to other men, not by reason of blind obstinacy, but with firmness derived from a conscious evaluation of relevant alternatives (Whitehead, 1929/1967, pp. 94–95).

As an illustration, Whitehead invokes a time long past: “More than two thousand years ago the ancients symbolised learning by a torch passing from hand to hand down the generations. That lighted torch is the imagination of which I speak” (Whitehead, 1929/1967, p. 97).

Whitehead wryly described the entire western philosophical tradition as “a series of footnotes to Plato” (Whitehead, 1929/1979, p. 39), a case which can certainly be supported. Plato himself, in his *Republic*, famously employs an allegory of a cave in which prisoners are chained with their backs to the firelight to represent the relationship of our perceptions, based on

appearances, to the ‘true’ reality of forms, and asks: “‘What do you think such people would have seen of themselves and each other except their shadows, which the fire cast on the opposite wall of the cave?’” (Plato tr. Rouse, 1956, p. 312). Thus, the way humans learn about the world is imperfect as well as, necessarily, imaginative. Plato’s analogy could not be more vividly expressed than by the prehistoric cave paintings of southern France of which, ironically, he would have been unaware. In April 2011, images of a cave in the Ardèche region of France came to the public in the form of a 3D film by Werner Herzog, *Cave of Forgotten Dreams: Mankind’s Lost Masterpiece*. The walls of the Chauvet-Pont-d’Arc cave are covered by drawings, paintings, and engravings by master artisans of the Upper Paleolithic. They were discovered on 18 December, 1994, by three speleologists. The artists must have completed their work by torchlight, as all the images are some distance from what would have been the cave’s entrance. Carbon dating of the images indicates they are 32,000 years old, making them the oldest of their kind and evidence of the earliest known appearance in Europe of *Homo sapiens sapiens*, our particular subspecies (Ministère de la Culture et de la Communication, n.d.). They are significantly older than the images on the walls at Lascaux, a cave in the Dordogne region of France discovered by four boys on 12 September, 1940, which have been dated to about 18,000 years old (<http://www.lascaux.culture.fr>). The walls of the Chauvet-Pont-d’Arc cave are teeming with evidence of the abundance of fauna from prehistoric times. There are bears, horses, lions, bison, aurochs, ibex, mammoths, a panther, butterflies, an owl and other birds, rhinoceroses, and reindeer, as well as the skeletal remains or paw prints from bears, hyenas, bald eagles and wolves. Some of the animals are represented to have eight legs instead of four, giving the impression of what Herzog calls proto-cinema. In addition, they found the footprints of a boy, a panel of vulvas and a single image of the lower torso of a woman entwined with a bison, as well as positive and negative impressions of human hands. Remnants of practising drawing, or evidence of apprenticeship, have not yet been found. It is certain, however, that these prehistoric

masters would have communicated and shared experiences with the younger generation in a manner that would certainly resonate with Whitehead's suggestion that "From the very beginning of his education, the child should experience the joy of discovery" (Whitehead, 1929/1967, p. 2).

The images on the walls are drawn with sufficient accuracy to enable identification of subspecies, yet stylized and in a manner so in harmony with the parietal art at Lascaux, that archaeologists would have considered them from that era without the help of carbon dating. The antiquity of one panel in particular raises an enigma: there are overlapping images of animals of very similar appearance, but carbon dating indicates they were drawn 5,000 years apart. As a comparison, the Pyramid du Louvre was built about 4,600 years after the great pyramids of the Old Kingdom of ancient Egypt, and the earliest form of written text was developed by the Sumerians about 5,000 years ago (<http://www.britishmuseum.org>). Modern architectural and written forms are recognizably of a similar lineage to those of antiquity, yet have undergone enormous changes. The conundrum of this panel of the Chauvet cave lies in the fact that the images are separated by a similar time frame, but are so comparable they might have been drawn by the same artist. Part of an explanation might lie in realizing the degree to which this art is dependent on and evidence of the individual's sense of wonder, implicit in the ability to perceive the world around them and retain an accurate memory of the experience. These are skills which have remained largely unchanged over more than 30,000 years, contrary to the general rate of change known by humans in the last five millennia and particularly the last century. Orr expresses this sentiment thus:

Before their minds have been marinated in the culture of television, consumerism, shopping malls, computers, and freeways, children can find the magic in trees, water, animals, landscapes, and their own places. Properly cultivated and validated by caring and knowledgeable adults, fascination with nature can mature into ecological literacy and eventually into more purposeful lives (Orr, n.d.).

In a later section of this chapter, evidence of the practice of this pedagogy will be outlined.

Thinking

If a sense of wonder begins with awareness of sensory perceptions, thinking is a process of reasoning about things, where the starting point is often perceptions themselves. The year before he died, the British scientist Gregory Bateson published *Mind and Nature: A Necessary Unity* (1979). Robert Flood said of Bateson's work that

He drew no defining line between natural and social arrangements and ultimately concluded that patterns and order in nature come together in certain ways in mental activity. The human mind thus is both a part of nature and a distinct thing (Flood, 2001, pp. 134–135).

It is in *Mind and Nature* that Bateson explores links between thinking and what could be considered a sense of wonder, or as he might present it, a consideration of our sense of aesthetic unity linking the things of Earth with how we think of them. He had been developing these ideas over a long period of time, the germ of which had been with him since he was a boy (Bateson, 1979, p. 6). Some emerged in his presentation “Form, Substance, and Difference” in 1970, later to be published as a chapter in *Steps to an Ecology of Mind* (1972/2000). In the first chapter of *Mind and Nature*, Bateson shares that he was starting to “reflect, not upon our own knowing, but upon that *wider knowing* which is the glue holding together the starfishes and sea anemones and redwood forests and human committees [sic]” (emphasis in the original; Bateson, 1979, p. 5). He discussed “*The pattern which connects*. Why do schools teach almost nothing of the pattern which connects?” (emphasis in the original; Bateson, 1979, p. 8). Although this question is difficult to answer, David Orr has suggested that a goal of ecological literacy “is not just mastery of subject matter but making connections between head, hand, heart, and cultivation of the capacity to discern systems – what Gregory Bateson once called ‘the pattern that connects’” (Orr, 2005, p. xi). Bateson himself detailed the phrase itself: “*The pattern which connects is a metapattern*. It is a pattern of patterns. It is that metapattern which defines the vast generalization that, indeed, *it is patterns which connect*” (emphasis in the original; Bateson,

1979, p. 11). He points out that “the right way to begin to think about the pattern which connects is to think of it as *primarily* (whatever that means) a dance of interacting parts” (emphasis in the original; Bateson, 1979, p. 13). This dynamic, holistic mode of thinking about the surroundings we find ourselves in and our interactions with them has great relevance to the field of sustainability learning.

In Bateson’s view, this sense of unity is fundamental and the pattern which connects is the only pattern. He states,

We are beginning to play with ideas of ecology, and although we immediately trivialize these ideas into commerce or politics, there is at least an impulse still in the human breast to unify and thereby sanctify the total natural world, of which we are (Bateson, 1979, p. 18).

Further, he asserts that our sense of separation from nature is “an epistemological mistake” (Bateson, 1979, p. 18). The introduction to the 21st-century edition of *Steps to an Ecology of Mind* was written by Margaret Mead and Gregory Bateson’s daughter, Mary Catherine Bateson. She underscores the significance that Bateson conferred on our habits of mind and their link to environmental issues. She relates that “Gregory was haunted in his last years by a sense of urgency, a sense that the narrow definition of human purposes, reinforced by technology, would lead to irreversible disasters, and that only a better epistemology could save us” (M.C. Bateson, 2000, p. xiv). Over the more than three decades since Bateson’s death, what would be entailed by this epistemology continues to emerge, a critical subject for sustainability and education relating to a liveable future.

Other researchers have touched on the importance of perceiving the pattern which connects in their own work. In Fritjof Capra’s *The Web of Life* (1997) and *The Hidden Connections* (2004), the pattern which connects is at the core of his work, which also fully acknowledges the influences of systems thinking and complexity theory:

...the shift from the parts to the whole can also be seen as a shift from objects to relationships.... For the systems thinker, the relationships are primary.... This

“network thinking” has influenced not only our view of nature but also the way we speak about scientific knowledge (Capra, 1996, pp. 37–38).

Stephen Sterling’s work at many points (Sterling, 2002; Sterling, 2010) has touched on the importance of thinking and its role in education for sustainability. However, this is most plainly visible in his doctoral thesis *Whole Systems Thinking as a Basis for Paradigm Change in Education*, which closely and explicitly aligns with Batesonian views, as he acknowledges “a close association between epistemology and perception – between how we know and how we see” (Sterling, 2003, p. 85). Sterling bases his model of learning on that proposed by Bateson in “The Logical Categories of Learning and Communication” in *Steps to an Ecology of Mind*. Both models include three aspects, where Sterling describes seeing, knowing, and doing, while Bateson’s terms are Learning I, II and III. In an appendix to his thesis, Sterling makes use of comparative tables outlining triadic schemes to elaborate on what he terms ‘whole systems thinking’. These cite relevant work of his own as well as other systems theorists such as Bateson, Bánáthy, Bawden, and Argyris and Schön. Of these, the work by Argyris and Schön (1978) is of particular relevance, with their terminology of single- and double-loop learning. Sterling aligns triple-loop and transformative learning (Sterling, 2003, p. 94). He goes on to characterize and extend Argyris and Schön’s scheme as follows: “Reflection in action: single loop; Reflection on action: double loop; Contemplation: triple loop” (Sterling, 2003, p. 431). Triple-loop learning represents authentic engagement through awareness of the paradigm shaping the cognition related to learning. Significantly, Sterling’s whole systems thinking, which he takes as fundamental to re-visioning environmental education, reflects Bateson as it places at its core both a fresh sense of perception and cognition in the roles of “*re-perception, re-cognition and realisation*” as “fundamental to the emergence of the postmodern ecological worldview” (emphasis in the original; Sterling, 2003, p. 420).

Although Bateson's work illustrates the link between a sense of wonder and the process of thinking, thinking in a more general sense and its value to learning have been core to educational discourse in the Western world since at least the Platonic dialogues 2500 years ago; in particular Plato's *Theaetetus*, dating from approximately 369 BCE, discusses three conceptions of knowledge in turn, finding each of them inadequate: knowledge as perception alone, as right judgment, and as communicated right judgment (Stanford Encyclopedia of Philosophy, n.d.). The past hundred or so years have seen much exploration of the realm of thinking and creativity, with research efforts globally providing implications for how we solve problems, relate to ourselves and the environment, and arrange our institutions of learning.

Cognition in an Environmental Context

British educator and cognitive researcher Michael Shayer and his colleagues have worked extensively on quantifying students' cognitive development in research protocols extending over decades (Adey, Csapó, Demetriou, Hautamäki & Shayer, 2007; Adey & Shayer, 1990; Shayer, 1987). He and his colleagues take as a framework Jean Piaget's stage analysis of the childhood genesis of human knowing, as recounted in *The Principles of Genetic Epistemology* (Piaget, 1972; see also Smith, 2001). The significance of Shayer's research for sustainability learning lies in the implications of students performing at a lower Piagetian level of thinking. "Compared with 1976 more pupils now develop and complete the *descriptive* thinking characteristic of concrete operations by the age of 14, but far fewer go on to develop the *interpretative* and *evaluative* level of thinking" (emphasis in the original; Shayer & Ginsburg, 2009, p. 416). A style of cognition needed for a liveable future includes interpretive and evaluative levels of thinking, which are fundamental to what I term sustainability cognition. Other researchers have brought their own terms to what might be considered aspects of this concept, such as environmental thinking, environmental thoughtfulness, or environmental cognition. Some of

these terms point towards the processes of thought, actual cognition, and others use the term ‘cognition’ in the place of knowledge or understanding.

In 1974, James Swan wrote a chapter about human objectives for environmental education in *Environmental Education: Strategies Toward a More Livable Future*, which included a section about “ecological thinking” (Swan, 1974, p. 31). Here, he questioned: “how much serious time is given in our schools to helping students develop processes of thinking that could be more effective in resolving complex problems?” (Swan, 1974, p. 32). He suggested that “one must learn to think in systems of interacting factors”, to engage with “Problem-solving [as] a process of thinking”, which he considers to be a “cognitive need” (Swan, 1974, p. 32). He states that “What is advocated here is the teaching of ecological thinking”, which would include as a component “the development of a future perspective” (Swan, 1974, p. 33). Although relatively brief, Swan’s comments point to the fact that he considers ecological thinking to be a particular style of thinking process and that it is both teachable and learnable. Aspects of Swan’s vision regarding ecological thinking find resonances in the writing almost thirty years later of Carmela Federico, Jaimie Cloud, Jack Byrne and Keith Wheeler when they touch on “systems thinking” being a skill that includes problem-solving and consideration of the future, describing it as an

ability to conceive of and model complex, interrelated “systems of systems”, with complex feedback loops and dynamic equilibria; the ability to see beyond short-term benefits to long-term (seventh generation) consequences of an action; the ability to understand the connection between ecological, economic, and social systems in human history and human actions; and the ability to understand the complex, interconnected aspects of globalization and the relationship between science, technology and society (Federico, Cloud, Byrne & Wheeler, 2003, p. 10123).

In 1975 George Martin described a medium-term objective of environmental education to be “environmental thinking”, which included “the ability to 1. Obtain significant meaning from environmental facts; 2. Apply environmental facts and generalizations to the solution of new

problems; 3. Respond critically and discriminately to ideas and arguments about environmental matters” (Martin, 1975, p. 27). Martin’s comments about environmental thinking are also brief, and this essay was his only submission to the book, prefaced with a note by Keith Wheeler stating that Martin had died during the final stages of the preparation of its manuscript. Although Martin did not elaborate beyond these three points regarding environmental thinking, they do point to a suggestion that individuals have the ability to move beyond mere description of the environment and environmental issues in order to interpret and evaluate matters relating to the environment.

Martin’s work emerged in an era in which Gregory Bateson was working, presenting on a similar point in “Pathologies of Epistemology” at a conference in 1969, later published as a chapter in *Steps to an Ecology of Mind* (1972/2000). Bateson stated: “I believe that this massive aggregation of threats to man and his ecological systems arises out of errors in our habits of thought at deep and partly unconscious levels” (Bateson, 1972/2000, p. 495). Bateson’s linking of our thinking to the state of the environment is a strong enticement to consider taking action to change our thinking. His daughter, Mary Catherine Bateson, took up this challenge in her introduction to the 21st-century edition of *Steps to an Ecology of Mind*, where she stated: “Ecological health continues to elude us – and perhaps indeed depends upon the reconstruction of patterns of thought” (M.C. Bateson, 2000, p. xii). She closes with the injunction: “It is more important now to respond. Following Gregory in his development is probably the best way to prepare for the steps that still need to be taken, the moments of imaginative recognition that lie ahead” (M.C. Bateson, 2000, p. xiv).

Childhood Experiences Informing Adult Perspectives

In September 1976, Margaret Mead wrote the introduction to Edith Cobb’s book, *The Ecology of Imagination in Childhood*. Here she explained that she was the sole survivor of

Cobb's collaborators and could therefore outline the events of the 30 years over which Cobb researched and worked on her book, tracing the arc of development of Cobb's "theory of the significance of childhood imagination" (Mead, 1977, p. 6). Mead stated that one of the main illuminations she drew from Cobb's writing was "The idea that there was an intrinsic human need for an understanding of the natural world, a need as important as the basic needs that human beings share with animals" (Mead, 1977, p. 8). Further, she pointed out that "The first step is to recognize the importance of childhood: to recognize what we can do with the freshness of the imagination" (Mead, 1977, p. 23). This comment also underscores the relevance to adults as much as to children of childhood development in the context of nature as a critical factor in shaping sustainability perspectives.

As can be detected in the title of Cobb's article (1959) and book (1977), *The Ecology of Imagination in Childhood*, the relationship is infused with an organic understanding of our place in a larger system, alongside our thinking and imagination. A central point in Cobb's belief regarding a sense of wonder is the genesis of knowledge. The first use of the phrase suggests a link between wonder and understanding on an almost cellular or neurological level. She underscores

the value of the child's sense of wonder to knowledge and learning.... Yet the intuitive placing of the child in the midst of the natural world when referring to the sense of wonder is in itself evidence of some biological basis for the attitude of wonder (Cobb, 1977, p. 24).

The second chapter of Cobb's book, "Wonder as the Genesis of Knowledge", echoes both Piaget's genetic epistemology as well as Plato, "who first defined wonder and designated it as the cause of knowledge" (Cobb, 1977, p. 27).

Plasticity of perception is a theme that Cobb brings to the fore in both her book and article, as she refers to the "plasticity of perceptual response to environment in childhood" (Cobb, 1977, p. 19); "The plasticity of response and the child's primary aesthetic adaptation to

environment may be extended through memory into a lifelong renewal of the early power to learn and to evolve” (Cobb, 1959, p. 538). Her use of the term ecology is often with the sense of a living, responsive flow between individuals and their surroundings, associated by changing patterns of energy that might allow the detection of the biology of thought, given an appropriate methodology.

At points in her book, Cobb refers to one particular style of thought in conjunction with neurophysiology that she considers “our most precious tool, compassionate intelligence” (Cobb, 1977, p. 25). As presented in their portraits in Chapter 7, study participants CA-Coord and CA-Teach4 make very similar points regarding the essential need for compassion, and this point was also addressed earlier in this chapter in the context of Kübler-Ross’ work on the grief cycle. Cobb touches on the dynamic nature of this form of intelligence as humans interact with nature, pointing out that

True learning is a response to a stimulus which evokes appetitive behavior.... I believe this process can take place only when experience of the world and man is informed by compassionate intelligence.... The disturbance of ecological balance in the natural world follows upon individual behavior that is unduly limited to self-interest when mind dwindles or becomes rigidly fixed... (Cobb, 1977, p. 70).

Here, Cobb states clearly the link between a style of thinking and deleterious consequences to the environment. It would be interesting to find out if it would be possible to trace the effects of nature and what Cobb refers to in our living response to nature as compassionate intelligence in a similar way to that chosen by 21st-century neuroscientists on brain plasticity. Cobb’s influence continues to be felt as a touchstone in the work of others, such as David Sobel (1993) and Stephen Kellert (2005), who resonate with her view regarding the mutual reflection of our thinking and the natural world.

American educator William Bigelow has touched on the adventures of children in their locale, with ensuing knowledge ineffectively used by teachers in school. In 1996, he published an article, “How My Schooling Taught Me Contempt for the Earth” in *Rethinking Schools*. In it,

he queried, “How did our schooling extend or suppress our naïve earth-knowledge and our love of place? ... We actively learned to *not-think* about the earth, about that place where we were” (emphasis in the original; Bigelow, 1996, p. 15). An echo of Bigelow’s words can be found in the writing of Heila Lotz-Sisitka, who touched on the work of Nancy Dudley when she said that: “I have learned that we need to ask questions about what we have not thought to think” (Lotz-Sisitka, 2002, p. 118). Although Bigelow’s article was rather tentative regarding the alternatives to learning to not-think, he does say that “I can offer only my thoughts on the broad principles of constructing an ecologically responsible curriculum”, which would include aspects such as acknowledging that place matters, life’s interconnectedness, and an “ecological rethinking” (Bigelow, 1996, p. 17).

Fostering Cognitive Development in Practice

A gap has long been acknowledged between intentions and actions regarding the environment, named the Stevenson Gap, after Robert Stevenson described it in his 1987 article, “Schooling and Environmental Education: Contradictions in Purpose and Practice”. This article was reprinted twenty years later in a special issue, 13 (2), of *Environmental Education Research (EER)* in 2007, along with more recent work by others, such as Elisabeth Barratt Hacking, William Scott and Robert Barratt, on the topic. Stevenson went on to explore how environmental thought and environmental thoughtfulness are necessary when dealing with environmental issues (Stevenson, 1993; 1997). Stevenson’s use of the term “environmental thoughtfulness” relates more to understanding of issues rather than style of thought, as seen in his description of various curriculum models, where “these alternative perspectives emphasize the need for students to actively construct environmental understandings and values” (Stevenson, 1993, p. 8). Although the term environmental cognition was used, the challenge at the heart of work such as Stevenson’s or that of Kara Chan (1996, 1999) generally relates not to the

processes of acquiring knowledge or understanding, but rather to the topic being understood and the development of knowledge about a given issue, particularly as it relates to pro-environmental action. This may perhaps be regarded as a limitation, or at any rate a limiting of scope, when set against the transformative thinking advocated by writers such as Sterling and Orr.

In 2002, Michael Bonnett published his article “Education for Sustainability as a Frame of Mind”, in which he discusses the idea that the heart of this interpretation of sustainability is “the notion of a right relationship with nature which both conditions our attitudes towards the environment and our sense of our own identity.... [T]he essence of sustainability, so conceived, is intrinsic to authentic human consciousness” (Bonnett, 2002a, p. 9). Bonnett’s work over a long period of time has been informed by and has had as its focus that of the German philosopher Martin Heidegger (Bonnett, 1983; Bonnett, 1994; Bonnett, 2000; Bonnett, 2001; Bonnett, 2002a, 2002b). Of particular influence are Heidegger’s *Being and Time* (1927/1962) and *What is Called Thinking* (1954/1968), which in his first of a series of lectures said that “Teaching is more difficult than learning because what teaching calls for is this: to let learn” (Heidegger, 1954/1968, p. 15). Regarding general thinking, Bonnett reveals the living, responsive qualities of thinking, since:

What was crucial for Heidegger was that learners submit themselves to the demands and rigour of thinking – to listen to what *calls* to be thought from out of the unique learning situation in which they are involved.... For Heidegger, genuine thinking is not the assimilation of a series of gobbets of pre-specified information and ideas, but an exciting and demanding journey into the unknown (emphasis in the original; Bonnett, 2001, p. 24).

These suggestions appear to be highly relevant not only to the practice of education in general, but to sustainability learning in particular, given the ever-changing state of affairs regarding the environment and the choices of response available.

Regarding nature and thinking about nature, the core of Heidegger’s article “On the Essence of the Concept of ‘Nature’ in Aristotle’s *Physics*, Book I” (Heidegger, 1939/1998),

Bonnett suggests that Heidegger “was right in seeing that there is an important sense in which the idea of ‘nature’ that we hold defines our understanding of, and attitude towards, both the world and ourselves” (Bonnett, 2002a, p. 14). This article was preceded by “Environmental Concern and the Metaphysics of Education”, in which Bonnett explores related issues further, asking, “*What constitutes a right relationship with nature?*” Such a question raises issues regarding “the significance of our relationship with nature for the constitution of *our own identity* – our sense of place and purpose in the greater scheme of things. We define ourselves in relation to nature” (emphasis in the original; Bonnett, 2000, pp. 594–595). Moving beyond issues of identity, Bonnett touches on perception and cognition as he states:

It is surely true that what we think of as “nature” and “natural” (that is, what is in keeping with nature) and how we think of these, orientate us at a fundamental level toward everything we encounter, pervading our understandings and interactions in profound but largely unrecognised ways.... At the deepest level, such notions condition how the world is revealed to us and what is perceived as fitting in terms of how things are and ought to be.... And how we think of nature sets the tone for how we think of reality in general; there is a level at which our relationship with nature sustains us not just physically but cognitively, emotionally and spiritually (Bonnett, 2000, p. 595).

Bonnett’s writing regarding education for sustainability as a frame of mind are a significant contribution to this field, one that provides avenues for further exploration.

Richard Louv’s 2005 book, *Last Child in the Woods*, points to individuals of all ages as being “nature smart” (Louv, 2005, p. 71). His 2011 book, *The Nature Principle*, explores the role of naturalist intelligence further in discussing what is entailed by a hybrid mind, one able both to deal with the conditions and demands found in a high-tech world and to experience and benefit from nature. He stated, “electronic immersion, without a force to balance it ... drain[s] our ability to pay attention, to think clearly, to be productive and creative.... *The more high-tech we become, the more nature we need*” (emphasis in the original; Louv, 2011, p. 24). This contention is supported by various findings cited by Louv (Kaplan, 1984; Kaplan, 1995; R. Kaplan & S. Kaplan, 2011). The findings touched on by Louv support proponents of bringing

students to the outdoors (Cheng & Monroe, 2012; Ernst & Monroe, 2004) as well as bringing it closer to students through school ground greening (Rickinson & Sanders, 2005; Malone & Tranter, 2003).

The research Louv cites points mostly to the possibilities of improving an understanding of the relationship between aspects of cognition, such as mental acuity and creativity, and time spent with nature, whether in an urban or rural setting. Evidence exists regarding improved cognition from exposure to nature, but the Canadian cognitive scientist Zenon Pylyshyn at Rutgers University argues in effect that it leaves untouched the cognitive architecture, “[the] set of properties of mind that are fixed with respect to certain kinds of influences” (Pylyshyn, 2002, p. 160). From a different research tradition and with an arguably different conclusion, however, the American neuroscientist Richard Davidson, of the University of Wisconsin-Madison, has documented the link between mindfulness meditation and neuroplasticity, or the brain’s ability to change both its structure and function. Since exposure to nature has significant features in common with mindfulness practice, such as being present to the moment and deepening the quality of one’s awareness, Davidson’s research may be seen as potentially quite relevant to Louv’s position.

Davidson’s research used electroencephalograms (EEG) and functional magnetic resonance imaging (fMRI) to show an increase in gamma waves and brain functionality when studying novice meditators and monks with a meditation training of between 10,000 to 50,000 hours. Gamma-band frequencies play a role “in mental processes such as attention, working-memory, learning, and conscious perception”, and integrate “neural processes into highly ordered cognitive and affective functions” (Lutz, Grelschar, Rawlings, Ricard & Davidson, 2004, p. 16369). Sharon Begley’s article regarding this research appeared in *The Wall Street Journal* in 2004, where Davidson stated that the novice meditators “showed a slight increase in gamma activity, but most monks showed extremely large increases of a sort that has never been reported

before in the neuroscience literature” (<http://online.wsj.com/>). At points, the monks produced gamma waves 30 times stronger than those of the novices, with strong activity in the left prefrontal cortex, the seat of positive emotions. The study appeared in the *Proceedings of the National Academy of Sciences* and concluded that the changes in EEG signatures showed a “positive correlation ... with hours of training.... The study of experts in mental training may offer a promising research strategy to investigate high-order cognitive and affective processes” (Lutz et al., 2004, p. 16373).

The results with monastics who have 10,000 hours or more of meditation training, although interesting, does not appear to be relevant to most individuals or to sustainability education. However, Davidson, Jon Kabat-Zinn and other researchers have explored the effects of an eight-week training program in mindfulness meditation on brain and immune function (Davidson et al, 2003, p. 565). The mindfulness-based stress reduction (MBSR) program is a course developed at the University of Massachusetts Medical School that entails eight weekly sessions in classes of three hours each, in addition to informal meditation of an hour a day at home with guided audiotapes. Their study, “Alterations in Brain and Immune Function Produced by Mindfulness Meditation” compared brain electrical activity in a group of meditators compared to a control group before, immediately after, and four months after the end of the meditation course. The study’s focus is “on emotion-related brain activity because meditation has been found in numerous studies to reduce anxiety and increase positive affect” (Davidson, et al, 2003, p. 564). It stands as the first to document such changes:

increase in left-sided anterior activation ... significant increases in antibody titers to influenza vaccine among subjects in the meditation compared with those in the wait-list control group. Finally, the magnitude of increase in left-sided activation predicted the magnitude of antibody titer rise to the vaccine (Davidson et al., 2003, p. 564).

The study indicates “that a short training program in mindfulness meditation (MBSR) has demonstratable effects on brain and immune function” (Davidson, et al, 2003, p. 569). The

researchers underscore the significance of their findings in that the brain “activation asymmetries are plastic and could be shaped by training”; “individuals with greater left-sided anterior activation have been found to show faster recovery after a negative provocation” (Davidson et al, 2003, p. 569). In their various research teams, Davidson, Kabat-Zinn and their colleagues have therefore demonstrated that both monastics and individuals who engage in relatively short periods of meditation training provide evidence of observable changes in brain activity.

If Edith Cobb had lived another 30 years, her work on *The Ecology of Imagination in Childhood* would have undoubtedly incorporated into its mosaic design the findings of Davidson and his team of scientists to support her own emerging thoughts regarding neurology, thinking and nature. Indeed, the benefits of mindfulness are now being discussed in a wide variety of forums, including *Oxford Today*, which recently led with an article reporting on clinical psychologist Mark Williams of the University of Oxford in a discussion regarding the scientific case for meditation practice. The article prominently featured MRI images that show neurological changes after eight weeks of mindfulness training. (Lofthouse, 2012). A question of value for further research would be: What would a comparable course to the eight-week MBSR course look like in supporting sustainability cognition, and would comparable shifts in brain structure and function be observable in those individuals who have engaged in such a course? Although neither this particular type of course nor the research to monitor its effects have yet been developed, support for aspects of sustainability cognition is being found in the practice of sustainability education in schools in North America and the United Kingdom at present, as discussed in the following section.

From Thinking to Action

If connection to and awareness of our environment arise through a sense of wonder which informs thinking, these factors also inform the motivation behind action. The type of action that

will be of focus here is taking place in sites of learning within the formal education sector of schools; in particular, schools in North America and the United Kingdom that are making efforts to bring about changes in the way they impact the environment as well as the type of learning that takes place for both students and adults. In their article discussing the environmentally educated teacher in the context of pre-service teacher education programmes, Oulton and Scott describe a shift from thinking to action through four levels of competency. The environmentally educated teacher would move from basic knowledge of ecological foundations (Level 1) through conceptual awareness (Level 2) and an ability to investigate environmental issues and evaluate solutions (Level 3) towards environmental action skills (Level 4) (Oulton & Scott, 1995, pp. 230–231). This progression mirrors the discussion here and is relevant to all educators interested in environmental education, regardless of their level of experience. Many and varied studies involving a number of different disciplines have contributed to this field of moving to action in ESD, such as: action competence, action learning, action research, citizenship action, critical theory, critical thinking, and inquiry learning, to name a few (Tilbury & Cooke, 2005, pp. 111–114).

During my research trip to Lithuania, I discussed the quandary of supporting individuals to make wise choices regarding their actions with the national coordinator of the EcoSchools program. We agreed that certain results were desirable to bring about in the world that would lead to a more liveable future, but that those results hinged on certain actions taking place. As I said, “How do you get people to take action? They have to want to take action. So how do you get people to want to take action?” At this point our conversation lagged, as neither of us had the answer. In fact, it is simply not possible to coerce an individual to do anything; they have to want it innately.

Environmental educators Heimlich and Ardoin considered this issue in detail in their article “Understanding Behaviour to Understand Behaviour Change” (2008), in which they

assembled a comprehensive image of theories of behaviour change, particularly as they relate to the environment. In doing so, they contextualized material that remains current in discussions of sustainability learning within an historic framework, including work by Julian Rotter (1954) on locus of control, Ajzen and Fishbein (1977, 1980) on the link between attitudes and behaviour, and Albert Bandura (1977) on self-efficacy. The work of these psychologists has contributed to the field and continues to shape it in significant ways, particularly in framing the means by which individuals might narrow the perceived difference between theory and practice (Stevenson, 1987/2007), a gap which remains relevant in dialogue (Gough, 2002; Jensen, 2002; Kollmuss & Agyeman, 2002; Scott, 2002). Other authors from different but associated traditions have touched on this gap, for example as pointed out by Lisa Kretz in her article “Climate Change: Bridging the Theory-Action Gap,” in which she states that Plato wrote of “the problem of *Akrasia*, wherein one knows the right thing to do but fails to act accordingly” (Kretz, 2012, p. 9).

Dialogue regarding the drivers for environmental behaviour have infused others’ work in the field, including doctoral theses from Southern Illinois University at Carbondale in the 1980s such as those by Archibald Sia (1984) and Thomas Marcinkowski (1988), which cite variables associated with predicting responsible environmental behaviour. The findings related in these theses have informed research agendas at that time (Hungerford & Tomera, 1985; Hines, Hungerford & Tomera, 1986; Sia, Hungerford & Tomera, 1986; see also Bamberg & Möser, 2007), as well as research that followed on (Hsu, 2004; Hsu & Roth, 1999; Smith-Sebasto & D’Costa, 2010; Smith-Sebasto & Fortner, 1994), and more recently (Carmi, 2012; Fielding & Head, 2012; Uitto, Juuti, Lavonen, Byman & Meisalo, 2011). Within the field of environmental psychology, influences and resonances can be considered on the one hand in terms of ecology *and* psychology, as with the work of Florian Kaiser (Kaiser, Oerke & Bogner, 2007; Kaiser, Wölfling and Fuhrer, 1999), and on the other as insights into the ecology *of* psychology, an

approach pioneered by Edith Cobb (1959, 1977) and informing work in a similar vein by Ellen Almers and by Jody Davis regarding the sense of connection to nature with environmental behaviour (Almers, 2013; Davis, Green & Reed, 2009; Davis, Le & Coy, 2011). Kaiser, Wölfling and Fuhrer (1999) offer a clarification of the link between environmental attitude and ecological behaviour; Heimlich and Ardoin cite this article as proposing “a fused model that includes environmental knowledge, environmental values and ecological behavior intentions as the foundation of attitudes” (Heimlich & Ardoin, 2008, p. 222).

Noted social psychologists Icek Ajzen and Martin Fishbein began to outline their theory of reasoned action more than forty years ago (Ajzen & Fishbein, 1970, 1977, 1980; Fishbein & Ajzen, 1975). As Heimlich and Ardoin point out, their work still stands as a dominant model in environmental education (Heimlich & Ardoin, 2008, p. 229). In their 1977 article, Ajzen and Fishbein stated that “Measures of attitude will serve to explain the behaviors to the extent that they involve identical target, action, context, and time elements” (Ajzen & Fishbein, 1977, p. 914).

In their proposition of an alternative approach to behaviour change, Ajzen and Fishbein state “our view that beliefs are the basic determinants of any behavior. It follows that, in the final analysis, behavior change is brought about by producing changes in beliefs” (Ajzen & Fishbein, 1980, p. 223). They proceed to outline the various means or styles of appeal by which alcoholic patients may be persuaded to change their beliefs. An incredibly important point regarding their research in this chapter is that the fundamental goal is to elicit a commitment from the patients so that they would “sign up for the unit”, in order to engage in treatment through the hospital’s Alcoholic Treatment Unit (ATU) (Ajzen & Fishbein, 1980, p. 229). In discussing their results within a section entitled “Behavior Change”, they state that “participants who initially expressed willingness to be transferred were significantly more likely to actually

sign up for the ATU (82.5%) than were the initially unwilling participants (13.7%)” (Ajzen & Fishbein, 1980, p. 237).

The dilemma regarding Ajzen and Fishbein’s empirical study lies in the world of difference between an individual’s ability to state an intention regarding an action and the actual accomplishment of that action. The alcoholic patients in question were not followed to find out what fraction of them were able to engage with the process of treatment on the unit, let alone to successfully find ways of living for any period of time without reliance on the substance they had been abusing: a not insignificant gap. The difference between intention and action, termed the Stevenson Gap, is touched on by environmental education researchers (Barratt Hacking, Scott & Barratt, 2007; Stevenson, 1987), outlined in the preceding section. The words of participants in this thesis reflect this gap, such as those of one teacher at a school long dedicated to sustainability learning regarding staff members who arrive at the school in SUVs. He states:

Well, just a comment on the staff. I’m definitely big on lead by example you know. Do as I say and not as I do is not good. And then you’ve got all these teachers who are driving SUVs at an environmental school (CA-Teach6, p. 8).

In point of fact, as discussed in the final chapter of this thesis, a limitation of my own thesis is its lack of tracing the link between statements of action and their reality, since the data sprang from participant interviews. Nevertheless, the findings from these interviews, along with the key outcomes of the study, point to the means by which an individual’s sustainability framework may express alignment regarding their connection to, interpretation of, and active engagement with the environment.

Regarding environmental action, it is not for one individual or group to force a change in the willingness to engage in action of another with respect to the environment, but rather it is the responsibility of each individual to determine with awareness their own motivations and whether or not they lead to appropriate actions and results. For this issue, the fulcrum term might be seen

as willingness, as in the work of Ajzen and Fishbein, yet others might use the equally relevant term motivation. Joseph Goldstein succinctly emphasized the ‘upstream’ starting point for appropriate action when he pointed out that “everything rests on the tip of motivation” (Goldstein, 2002, p. 36). While the research area of behaviour change is broad and deep, one model of bringing greater awareness to action and its precursors is taken from the ancient teachings of Buddhism as expressed by Goldstein in his book *One Dharma* (Goldstein, 2002). He outlines this teaching in the following way:

Put simply, actions bring results.... [With] one essential step further in clarifying this process of action and result. The possibility of our happiness, and indeed for our entire ... journey, rests on the clarification that *what most completely determines the result of any action is the motivation behind it* (emphasis added; Goldstein, 2002, p. 36).

I have illustrated this concept in the following equation, which I term the action equation, not in the mathematical sense of certain expressions equating to others, but rather as a chemist refers to specific conditions giving rise to others.

Figure 4. The action equation.

For some, a useful entry point to the action equation may be motivation, whereas for others it may be in engaging with actions, then developing awareness of motivations through personal experiences of action. However, the exact entry is perhaps less important than the fact of beginning. A primary characteristic of a liveable future is that it is an ongoing process rather than a product obtainable in a defined period of time. Because the infinite is a concept that is difficult for most of us to grasp and motivate ourselves by, a liveable future is more easily framed as a series of goals towards which we work, continually replacing the achieved goals with new ones set further along the sustainability path. In this way, instead of process being important only in the service of goals, we have goals serving the ongoing process. These goals

might more accurately be characterized as interim end results. In breaking down the work of creating a liveable future, often the focus is on the interim end result, however defined, overlooking various prerequisites for that result to be realized. The first, obvious prerequisite for a result is appropriate action and the second, more subtle prerequisite is appropriate motivation. Influences on motivation exist, some of the strongest of which, such as the critical importance of hope, have been discussed by David Orr (Orr, 2007, 2009, 2011). In his essay, “Optimism and Hope in a Hotter Time”, Orr describes the function of hope as a means to engage with shaping the future. This resonant essay has been reprinted in a modified version within his 2009 book, *Down to the Wire*, excerpted on the Center for Ecoliteracy’s website under the title, “On Climate Change and Applied Hope”, and reprinted again in a compilation of 35 essential writings in his 2011 book, *Hope is an Imperative*. Participants cited in this thesis also see the imperative function of hope, as seen in the portraits of CA-Teach1 and CA-Coord in Chapter 7. Orr states that the young, in particular, “should be taught the many disciplines of applied hope.... Hope, authentic hope, can be found only in our capacity to discern the truth about our situation and ourselves and summon the fortitude to act accordingly” (Orr, 2007, p. 1395). He also suggests that there is great overlap between those actions we ought to take and those actions we want to take in building a liveable future, particularly for our children. “Ironically, what we must do to avert the worst effects of climate change are mostly the same things we would do to build sustainable communities, improve environmental quality, build prosperous economies, and improve the prospects for our children” (Orr, 2007, p. 1395).

Principles for Action and Change

Beyond his own writing, David Orr is known for his efforts to engage with sustainability in expressive ways within schools and communities. Over decades, he has been involved with diverse initiatives, including his contributions as a member of the board for the Center for

Ecoliteracy. Regarding terminology, the Center’s philosophy is that varieties abound that relate to similar practices: “The movement goes by many names: green schools, eco-schools, high-performance schools. We call it schooling for sustainability to underline its kinship with other global movements reshaping the relationships between human societies and the natural world” (Stone, 2009, p. 4). The Center has worked directly with schools, communities and organizations, focusing on school gardens, lunches and curricula, as well as the production of books such as *Ecological Literacy: Educating Our Children for a Sustainable World* (Stone & Barlow, 2005) and *Smart by Nature: Schooling for Sustainability* (Stone, 2009). Additionally, their efforts have supported government reform, such as the *No Child Left Inside Act*, H.R. 3036, which was passed on 18 September, 2008 by the US House of Representatives (U.S. House of Representatives, 2008).

The Center for Ecoliteracy’s Smart by Nature framework is a direct reflection of Sterling’s proposal. It aligns with David Orr, Jaimie Cloud, Rachel Carson and Fritjof Capra, among others, and is detailed in the Center’s 2009 publication, *Smart by Nature: Schooling for Sustainability*. In a chapter contributed by Lisa Bennett, “Where Teaching and Learning Come Alive”, the framework sets out 15 competencies that a well-rounded student needs for sustainable living:

Head (Cognitive): Approach issues and situations from a systems perspective; understand fundamental ecological principles.

Heart (Emotional): Think critically, solve problems creatively, and apply knowledge to new situations; assess the impacts and ethical effects of human technologies and actions; envision the long-term consequences of decisions.

Hands (Active): Feel concern, empathy, and respect for other people and living things; see from and appreciate multiple perspectives – work with and value others with different backgrounds, motivations, and intentions; commit to equity, justice, inclusivity, and respect for all people.

Spirit (Connectional): Experience wonder and awe toward nature; revere the earth and all living things; feel a strong bond with and deep appreciation of place;

feel kinship with the natural world and invoke that feeling in others (Bennett, 2009, p. 154).

The essence of this framework is for educators and students to work with their whole beings within the larger context in which they find themselves, connecting to, thinking about, and actively engaging with an expression of sustainability.

In the preface to *Smart by Nature*, Zenobia Barlow states that the Center for Ecoliteracy's vision for education

is founded on a conviction that the best hope for learning to live sustainably lies in schooling that returns to the real basics: experiencing the natural world; understanding how nature sustains life; nurturing healthy communities; recognizing the consequences of how we feed ourselves and provision our institutions; knowing well the places where we live, work, and learn (Barlow, 2009, p. viii).

The introduction draws to a close with an outline of Five Steps toward Becoming Smart by Nature: organize, envision, take stock, plan and reflect (Stone, 2009, p. 16). A crucial point is made, however, that "No two schools' circumstances are the same; there is no one-size-fits-all plan for schooling for sustainability. These suggested steps ... can be adapted for your circumstances" (Stone, 2009, p. 16). The emphasis being made by the specialist educators at the Center for Ecoliteracy based on their experience over the past two decades is that there are no sure-fire set protocols for sustainability learning, but there are methods and guiding principles available to be applied to individuals' unique circumstances. There are also indicators for success, such as the students leaving the school having experienced authentic sustainability learning. The suggestion is to "Visualize the Smart by Nature graduate. What should he or she know, value and be able to do?" (Stone, 2009, p. 47). Although the response to this question will vary, essential points raised in this thesis might be that graduates are connected to the environment and individuals around them; make use of sustainability cognition; and continually, creatively engage with real solutions through action.

The United States: Creativity and Change

The core of *Smart by Nature* proceeds to detail efforts taking place across the United States that illustrate a living expression of sustainability. Eighteen different profiles are clustered into four areas relating to sustainability schooling: lunch programmes, the campus, practices of the school as a community within its larger community, and the teaching and learning within the school. These schools also highlight the foibles of engaging in sustainability education:

“Perhaps no school provides a perfect example of schooling for sustainability. Perhaps no such achievement is even possible” (Stone, 2009, p. 159). The highlighted schools are located across the United States and include a variety from small to large schools or even school districts within the sectors of independent, public, and charter schools. They evidence success of using a large variety of strategies through “efforts that were initiated top down, bottom up, outside in, and inside out” (Barlow, 2009, p. viii). The message portrayed by the Center for Ecoliteracy is clear: any school, anywhere may engage in living sustainably.

This section and the next will explore the efforts of four schools in the United States (Martin Luther King Middle School, California; Willow School, New Jersey; Head-Royce School, California; Troy Howard Middle School, Maine) and four schools in the United Kingdom (Alphington Primary School, Exeter; Meare Village Primary School, Somerset; Staunton-on-Wye Endowed Primary School, Hereford; Glebe School, Kent). Various researchers have documented both general and case-study evidence of whole-school sustainability projects such as those European schools involved in the OECD’s Environment and School Initiatives (ENSI) project (Kyburz-Graber & Robottom, 1999; Mayer, 2004; McAndrew, 1992; OECD-ENSI, 1999; Posch, 1991, 1999; Smith, 2004), those Australian schools reported in the ARIES documents (Tilbury, Coleman & Garlick, 2005; Tilbury, Coleman, Jones & MacMaster, 2005; Tilbury & Cooke, 2005), or in other international comparisons (Breiting & Janniche, 1995; Breiting, Mayer & Mogensen, 2005; Jensen, 2005; Mogensen & Mayer, 2005).

Although much of the published material tends towards generalizations, evidence from case studies is available. Both the general and specific are used to good effect, for example by Mogensen and Mayer in their comparison of whole-school sustainability learning in 13 nations. Here they make apparent the overlap between different like-minded projects such as that of EcoSchools and the Baltic Sea Project (as they discuss in the sections regarding Finland and Sweden), the BLK “21” programme in Germany, the Forest School Program in Hungary, or the Scuole Capaci di Futuro in Italy (Mogensen & Mayer, 2005, pp. 102–350). The material to follow is not meant to be an exhaustive portrayal of sustainability learning globally. Rather, it serves to provide an impression of the texture of contemporary realized sustainability learning in two nations that share a language, yet have substantially different educational cultures.

A core element of sustainability education is a sense of dynamic development, which certainly is apparent in these illustrations. At the Martin Luther King Middle School in Berkeley, California, the Edible Schoolyard (ESY) was created through a collaboration between Alice Waters and Neil Smith, then principal. The ESY is a program where students grow, harvest, cook and enjoy fresh produce in meals they themselves serve in the school. Benefits from better nutrition have pointed to “higher achievement on standardized tests; increased cognitive function, attention, and memory.... Studies confirm children who garden score better in science, reading and writing, and independent thinking; have increased self-esteem and better attendance” (Stone, 2009, p. 23). Smith describes how a Revolutionary Committee was set up at the first staff development in the fall of 1989 when he began at the school, “designed to be a fluid group of the faculty so anyone could come” (Comnes, 2005, p. 137). The style of Smith’s leadership might be seen more as a facilitator rather than an expert. He points out:

For a project like The Edible Schoolyard to happen, there has to be a climate at the school where the ideas of reform are viewed positively.... When you build on other successes, people’s visions begin to expand. They begin to say, “We can do this”.... My vision was definitely a reformist vision, but it was broad enough that it could encompass a lot of ways to get to the end. I assume that lots of people

bring lots of ideas and that the collective group is smarter than anybody in the group (Comnes, 2005, pp. 144–145).

Smith's view on leadership reveals a quality of fluidity and responsiveness to the conditions faced; a sense of "shared leadership" that Stone and Barlow discuss in their introduction (Stone & Barlow, 2005, pp. 2–3).

At the Willow School in Gladstone, New Jersey, a small (144 students) K–8 independent coeducational day school founded in 2002 (The Willow School, n.d. a), the site and curriculum support students "to understand consequences and then take responsibility for their actions and decisions" (Stone, 2009, p. 77). Systems thinking permeates the school goals, which include "learning to recognize patterns, understand relationships, and make connections" (Stone, 2009, p. 77). Willow students experience a monthly, year-based rotation of a Core Virtues Program that supports their moral and ethical development, for instance (and with particular relevance to themes touched on in the interview data presented later in this thesis) responsibility in September and hope in June (The Willow School, n.d. c). The Willow School illustrates one of the four core principles of Smart by Nature, regarding sustainable living being rooted in a deep knowledge of place. Place-based education might be seen to begin with a love of place, or toponophilia, which lies as a central concept to sustainability. In his 1993 book, *Children's Special Places*, David Sobel draws out the connection to nature within the arena he and others (Gruenewald & Smith, 2008; Sobel, 2004) would later develop as place-based education. Sobel expresses toponophilia in the statement: "To experience a place deeply is to bond with a place" (Sobel, 1993, p. 159). The Willow School's mission statement touches on the importance of place, stating their school to be "dedicated to maintaining an environment where ... an understanding of place foster[s] independent thinking, creativity, responsibility, and integrity, [enabling children] to believe in their power to effect positive change" (The Willow School, n.d. b). The Willow School demonstrates an ability to consider its own responsibility to the larger

community from the perspective of being part of an interconnected system in the natural, built and learning environments of which it is a member.

The Head-Royce School in Oakland, California, is a larger (832 students) K–12 independent coeducational day school founded in 1887 (Head-Royce School, n.d.). In 2009 Head-Royce developed principles of good practice for 21st-century teaching and learning which resonate strongly with the Smart by Nature framework: 1. critical thinking (head); 2. creativity (hands); 3. interpersonal skills (heart); 4. global competencies (world); 5. sense of purpose (vision). Although each area contributes to sustainability education, it is the fifth arena that relates explicitly to sustainability: “personal investment in both our local community and larger world including a dedication to civic purpose and ecological sustainability” (Head-Royce School, n.d.). The school also has a specialized green mission statement, relating to four areas: sustainable resources, nutritional food, an ecological curriculum, and a healthy environment (Head-Royce School, n.d.). A key component is their commitment to help students develop “a love of nature”, a phrase that is embedded in their mission statement and the addition of which was seen as a turning point in its greening process (Stone, 2009, p. 177). A contributing factor to Head-Royce becoming one of the first K–12 schools to successfully incorporate Smart by Nature principles is the welcome individuals are offered to connect to the issue on a personal level: “when people have a personal connection to something, they are much more invested in seeing change happen.... This is about something that speaks to people – kids, teachers, parents, builders, maintenance staff – deeply and personally” (Stone, 2009, p. 183). Additionally, the Head-Royce learning community has envisioned what a green graduate would look like in terms of what they know, value and are able to do, and a central aspect lies in the quality of relationships from a systems thinking context while looking ahead with a beginner’s mind (Stone, 2009, p. 183).

On the other side of the United States, at its eastern seaboard, the Garden Project at Troy Howard Middle School in Belfast, Maine, has also supported students and educators alike to “learn about cultivating relationships with place and community.... [T]o work with, rather than compete with.... [To realize] the community reciprocates” (Stone, 2009, p. 36). Whether on the Pacific or Atlantic coast of North America, the reason that the quality of relationships we have with ourselves, with others, and with our surroundings are so important is detailed by Fritjof Capra in systems thinking terms: “Because living systems are nonlinear and rooted in patterns of relationships, understanding the principles of ecology requires a new way of seeing the world and of thinking – in terms of relationships, connectedness, and context” (Capra, 2005b, p. 20). This view is shared by John Lyle, who worked with David Orr as principle landscape architect for the Adam Joseph Lewis Center for Environmental Studies at Oberlin College. Lyle states: “The development of ecological understanding is not simply another subject to be learned but a fundamental change in the way we view the world” (Lyle, 1994, p. 269).

The United Kingdom: National Strategies

Schools in the United States are joined by others around the world, including the United Kingdom (Huckle, 2006), in evidencing the use of systems thinking in their functioning and outlook as institutions fostering learning for sustainability. A report of significant interest and relevance to this dissertation was created by Chris Gayford, written about a series of engaged schools across England in conjunction with the WWF-UK’s One Planet education programme. Gayford’s report is broadly similar in context and findings to profiles of schools outlined in *Smart by Nature*. Having as its focus 15 schools, including primary and secondary schools from small to large in both rural and urban settings, Gayford’s report, *Learning for Sustainability: from the pupils’ perspective*, is a three-year longitudinal study spanning June 2005 to June 2008. Significantly, its perspective is from the pupils’ voices, often neglected by comparison with

those of adults in the learning organization around them, and offering distinctive insights on various environmental issues.

In a departure from this adult-focused trend, a special issue of *EER* was devoted to Mark Rickinson's 2001 study, "Learners and Learning in Environmental Education", which took as its focus pupils themselves, citing Philip Payne's 1998 claim that "environmental education theory and research have overlooked 'the children who are the subjects of environmental education'" (Rickinson, 2001, p. 207). Rickinson's study arrived in the wake of two influential articles appearing in *Studies in Science Education*. Paul Hart and Kathleen Nolan's 1999 study, "A Critical Analysis of Research in Environmental Education", which took a more traditional frame than Rickinson's pupils' perspective, was itself an update of Peter Posch's 1993 study, "Research Issues in Environmental Education" (Scott, 2001, p. 205). Rickinson's article launched a vigorous discussion within *EER* among a number of researchers. For instance, Justin Dillon of King's College, London, sheds light on issues not addressed by Rickinson that would be worthy of future inclusion, particularly informal learning situations and, perhaps more critically, the dimension of theories of learning such as behaviourism, constructivism and situated cognition (Dillon, 2003). Nevertheless, Rickinson's survey represents a major incursion into the under-explored territory of the learner's experience.

Beyond foregrounding students, Gayford's report takes as its vision a broad one of sustainability, which encompasses "and integrates the aims of healthy lifestyles, environmental awareness and involvement with the local community" (Gayford, 2009, p. 1). Although there is a range in commitment and practice of learning for sustainability in these schools, they

were either already committed to learning for sustainability as an important part of their formal and whole school activities or they had made the decision that it was an important feature of their immediate future plans.... [They] are a representative sample of schools where it was expected that good quality learning for sustainability was likely to be found or developed (Gayford, 2009, p. 1).

The context in the United Kingdom in which these schools operate has had strong efforts from both governmental and voluntary sectors, which proliferated during the ten years (1997–2007) Tony Blair was Prime Minister. In a speech relating to climate change in September 2004, Blair firmly put his support behind the concept of engaged sustainability schools:

Sustainable development will not just be a subject in the classroom: it will be in its bricks and mortar and the way the school uses and even generates its own power. Our students won't just be told about sustainable development, they will see and work within it: a living, learning place in which to explore what a sustainable lifestyle means (DfES 2006b, p. 2).

Evidence such as Gayford's shows that Blair was describing a reality already found in Britain, one that has continued to strengthen over time.

In the decade after the Sustainable Development Education panel was set up in February 1998, producing *Learning for Sustainability in the Schools Sector* (1998) and *Education for Sustainable Development – More relevant than ever* (2001), much compelling work appeared within the ESD arena in Britain. For instance, the official body for inspecting schools in England, the Office for Standards in Education, Children's Services and Skills (Ofsted), produced a report which moved the agenda, *Taking the First Step Forward ... Towards an Education for Sustainable Development* (Ofsted, 2003). This was followed by a number of government agencies' efforts producing cornerstone documents such as the 2005 UK Government Sustainable Development Strategy, *Securing the Future*, produced by the Department for Environment, Food and Rural Affairs (DEFRA) and providing background with a national perspective and impetus for others' more specific work in the field of education.

Various publications by the Department for Education and Skills (DfES) appeared in 2006, such as *Sustainable Schools: For Pupils, Communities and the Environment – Consultation Paper* (DfES, 2006b), which is often known as the Sustainable Schools Strategy. This document outlined fundamental concepts such as recommending that sustainable schools be guided by the principle of care and suggesting eight doorways for avenues of change in their

national framework for supporting the governmental agenda that all schools to be sustainable schools by 2020. Asking, “So what is a sustainable school?”, the answer provided by the DfES in 2006 touches not just on care, but also on the importance of moving beyond proximal time and space. “We believe [a sustainable school] is one that is guided by the principle of care: care for oneself; care for each other (across cultures, distances and time); care for the environment (far and near)” (DfES, 2006b, p. 4). In another culture, terms used by researchers might have included compassion or love rather than care, but the sentiment of an engaged responsiveness to conditions arising flows through these meanings. The doorways of food and drink, energy and water, travel and traffic, purchasing and waste, buildings and grounds, inclusion and participation, local well-being, and global dimension (DfES, 2006b, p. 18) each relate to three other dimensions, the school curriculum, campus and community, which are also three key aspects of the framework outlined within *Smart by Nature*. Two of the schools highlighted in the Sustainable Schools Strategy were also included in Gayford’s study.

The Sustainable Schools Strategy was accompanied by another DfES publication detailing a mechanism for assessment of achievement, *s3: Sustainable School Self-Evaluation – For primary, middle and secondary schools* (DEFS, 2006a). This was revised in 2008 by the Department for Children, Schools and Families (DCSF), *s3: Sustainable school self-evaluation: Driving school improvement through sustainable development* (DCSF, 2008a) and joined other governmental consultation responses, such as *Sustainable schools for pupils, communities and the environment – government response* (DfES, 2006c), which itself suggests sustainability as a driver for whole-school improvement. Following on from the DCSF’s 2003 publication, *Every Child Matters*, the Sustainable Development Commission produced *Every Child’s Future Matters* in 2007, taking as its focus the environment while supporting broad concepts of sustainability. For its part in supporting the government’s agenda of all schools becoming sustainable schools by 2020, Ofsted produced reports such as *Schools and Sustainability: A*

climate for change? (2008f) and *Education for Sustainable Development: Improving schools – improving lives* (2009a). These documents took as their focus a mixed group of primary and secondary schools, inspecting 41 and 14 schools, respectively. Interestingly, for the 2009a Ofsted report, all of these 14 schools were visited three times over the same three-year period by Her Majesty's Inspectorate (HMI) as those used in Gayford's study, excluding only the Crispin School, Somerset.

Changes of British administration after Blair, who has been succeeded by Gordon Brown and then David Cameron, have in turn brought changes to the relative importance of ESD within the government's portfolio. Having launched the sustainable schools initiative, the Department for Education (DfE) made a decision in 2010 that they would no longer directly support it (SEEd [UK], n.d.). Additionally, the United Kingdom's Sustainable Development Commission was closed on 31 March 2011 (<http://www.sd-commission.org.uk>). The burden of support has since gone to voluntary organizations such as Sustainability and Environmental Education (SEEd), EcoSchools and the WWF-UK education programmes.

Instances of lived experiences in British schools

The website of the WWF-UK's One Planet Schools lists 42 stories from engaged schools in Ireland, England, Scotland and Wales illustrating efforts through various disciplines and foci ranging from the individual to the whole school (WWF, n.d. d). Of those stories, six relate to five different schools which are also the focus in Gayford's report. Overlaps of schools included in Gayford's 2009 study therefore extend to the Ofsted 2009a report, the DfES 2006b document and WWF school stories, so that three of the schools in Gayford's study (Alphington Primary School, Exeter; Meare Village Primary School, Somerset; Staunton-on-Wye Endowed Primary School, Hereford) are included in three of these documents, with one school for special needs students (Glebe School, Kent) included in all four documents. A point to note, however, is that even though this overlap between publications exists, neither the Gayford nor the Ofsted reports

refer explicitly to any school. Only the DfES document and the WWF school stories provide the explicit and valuable insights into sustainability practices at various sites.

The context of interest from so many different sources has shaped Gayford's report to the extent that many of the fundamental ideas from the emerging literature are found within it, such as

the idea that there should be a connection between learning and action; that schools can model good practice for children; and there can be a link between what the community of the school does and the way that schools demonstrate ways of working sustainably for the wider community (Gayford, 2009, p. 8).

These constructs are also found within the evaluation scheme which was used at each of the visits for the Ofsted (2009a) inspections. In developing a grounded theory for residential environmental education, Smith-Sebasto and Walker describe a similar approach, one which "is more efficacious when the program is presented based on a learner-centred model of content and skills selection and delivery and not an educator-driven, top-down approach" (Smith-Sebasto & Walker, 2005, p. 40). Although Gayford suggests that the 15 schools used in his study were selected as "all of [these schools] were identified for their expressed commitment to learning for sustainability" (Gayford, 2009, p. ii), the key findings of the Ofsted report show that one school made no improvement at all in its approach to sustainability over the three years, and that three of the schools had originally been inadequate. "At the beginning of the survey, none of the schools was outstanding in its approach to sustainability. By the time of the third visit ... [most] had improved by at least one inspection grade" (Ofsted, 2009a, p. 5).

All of the four schools that have been included in two or three reports in addition to Gayford's 2009 study (Ofsted, 2009a; DfES, 2006b; WWF, n.d. a, b, c, e) are registered EcoSchools except for Alphington Primary (Eco-Schools [England], n.d.). These results point to above-average performance schools, which Gayford addressed by pointing out that "the schools involved do not represent a random national sample but instead they are a representative sample

of schools where it was expected that good quality learning for sustainability was likely to be found or developed” (Gayford, 2009, p. 1). Unlike *Smart by Nature*, which included sustainability project details for mainstream primary and secondary schools across the United States, a mainstream British secondary school was not included in the detailed samples in these reports, as shown by the brief school descriptions included above. In part, the fact that secondary schools’ sustainability programmes are less high profile may in part be a result of attitudinal differences referenced by Gayford at the outset of his findings: “The pupils in the primary schools have generally shown more enthusiasm for all aspects of learning for sustainability than most pupils in the secondary schools” (Gayford, 2009, p. 12).

The Sustainable Schools Strategy document of the DfES includes a page on the Glebe School, outlining Glebe’s leading role in the Bromley Garden Project (BGP), which involves three other local schools (DfES, 2006b, p. 31). Glebe’s efforts leading to the creation of the BGP began in 2003 with the development of a wildlife pond on the school grounds, which in turn expanded to growing organic fruit, vegetables and flowers in its garden which they could then sell at the school tuck shop and local farmers’ markets. The project has been a means for motivating students and engaging them in real activities, as described by the Head of Geography at Glebe, Martin Crabbe: “The Bromley Garden Project has provided a focus for real-world learning that has motivated students to become collaborative learners. It has helped them to develop self confidence and a realisation that they can contribute positively to their communities” (DfES, 2006b, p. 31).

The WWF’s school story involving Glebe School, entitled “Pupils Take Control of Their Learning”, details a process by which pupils were able to steer their individual learning. Crabbe aimed to evaluate the impact of a participatory school grounds project on learning in a model similar to that found in participatory action research, where students had “decided on the learning content and approach and reflected on this learning” (WWF, n.d. c, p. 1). The benefits

of this approach are diverse, and suggest that it might support “students who may [otherwise] be excluded; deeper learning; enable a wider variety of learning styles; real connections to other subjects, places and people” (WWF, n.d. c, pp. 1–2). When the school was inspected for its ESD provision in 2008, the findings of HMI included the finding that “The focus on the care agenda linked to sustainability encourages pupils to be creative in their thinking and to explore sensitive issues such as feelings and emotions through the creative media of film and music” (Ofsted, 2008c, p. 2).

In his report, Gayford refers to the differentiation Paul Stern makes between “public sphere” and “private sphere” actions in his publication “Toward a Coherent Theory of Environmentally Significant Behavior” (Stern, 2000). The point is that any private-sphere action an individual might undertake, such as switching off lights or recycling, “is limited unless it is combined with organizing collective ‘public’ change” (Gayford, 2009, p. 5). The work at Glebe School as reported by HMI reveals this shift from the private towards the public sphere. Sustainability learning at Glebe School unpacks for students the ways in which choices and actions can be made, and to date has had far-reaching benefits, particularly for older students and those with learning challenges. Gayford suggests fundamental reasons for this type of learning: “It is apparent that pessimism can turn to hope when young people are given knowledge about how to act, and when what might be described as ‘unfocused fear’ is replaced by factual information and practical strategies for addressing issues” (Gayford, 2009, p. 5). Further, “It is not enough simply to promote action for the environment; we need to emphasise the most strategic actions” (Gayford, 2009, p. 5).

Although Alphington Primary School, Exeter is the school with the weakest result from the Ofsted ESD inspections, the WWF school story relating to Alphington’s sustainability endeavours, “Taking the Yellow Brick Road Together”, speaks to the collaborative nature of a staff working together in determining their path. In their case, enquiry groups were set up which

“first explored what sustainability meant to them, what it could bring to their new curriculum, and how they might define it as a teaching staff” (WWF, n.d. d, p. 1). Later, they gathered with a wider group of individuals, including parents, non-teaching staff and governors to reflect on sustainability for a day. What they found was that “in spite of their large staff numbers, they worked in an open and democratic manner – something which has carried through into the whole school community ... [and which] ‘validates each person’s experience, knowledge ... and what each of us are doing’” (WWF, n.d. d, p. 1). This resonates closely with the experience that Martin Luther King Middle School’s principal, Neil Smith, related in discussing the process by which the larger community gathered around the ESY project. In the context of the study, several participants alluded to whole-school synergies in their own experiences of the EcoSchools program; for example, LT-Teach6, portraited in Chapter 7, mentions the importance of whole-school involvement directly:

The best thing was that we all came together into one place and we decided what we should do (LT-Teach6, p. 7).

Sustainability learning is at an early stage at Alphington, with the Ofsted report stating that “The global dimension is more strongly emphasised than any other aspect of ESD because of the developing links with the school in the Gambia” (Ofsted, 2007a, p. 3). Additionally, “A large site adjacent to the school is being developed to create an outdoor classroom” (Ofsted, 2007a, p. 3). The following year, HMI noted that “Pupils have improved awareness of the need to lead sustainable lives partly because sustainability has a more visible profile around the school but also from what is happening in the world around them” (Ofsted, 2008a, p. 1). Also of note is that “A real ‘care’ agenda has developed as part of the changing ethos of the school” (Ofsted, 2008a, p. 2). Alphington Primary School has embarked on a whole-school initiative and these documents highlight efforts and challenges faced during their journey of transformation.

The WWF has published a school story, “Everyone Listened to, Heard and Respected” (WWF, n.d. b), about the process the Meare Village Primary School, Somerset, went through in developing a School Development Plan for learning for sustainability. In a manner similar to that used by Alphington Primary School, the staff engaged at a number of different times with different members of its larger community, including non-teaching staff, parents and the pupils themselves, with the intention of individuals being informed about “what was happening and to ask them what they wanted for the school and how they might be able to work together” (WWF, n.d. b, p. 1). The result was an example of a learning organization coming together as an entity in determining its own path. Relevant points arise in Robert Flood’s discussion of Peter Senge’s work (Senge, 1990; Senge, Kleiner, Roberts, Ross & Smith, 1994) on system dynamics and learning organizations. Flood explains Senge’s view that if there are five disciplines that underpin learning organizations, including systems thinking, personal mastery, mental models, shared vision, and team learning, “The fifth discipline is systems thinking that provides substance to the other four disciplines and hence to the learning organization as a whole” (Flood, 2001, p. 135). As an example of how one of these disciplines interacts with systems thinking, he shares: “Systems thinking in team learning identifies positive and negative synergy in discussion and dialogue where, respectively, the whole becomes greater or less than the sum of its parts” (Flood, 2001, p. 135; see also Flood, 1999). The quality of dialogue in learning organizations is very much part of shaping a sustainable future, particularly when seen through systems thinking. Further, empowering students, as took place at Meare Village Primary School through its whole-community engagement process, is seen as critical by several study participants, entailing for some (particularly the national coordinators) a genuine fostering of sovereignty:

Give pupils many different perspectives about issues, and then to take action. To think “what do I want to do, what do I think here” and then to show them how to take action, and then to take action (SV-Coord, p. 10).

Sovereignty forms a key element of the dynamic view, introduced in Chapter 1 and explored in depth in Chapter 8. Additionally, sovereignty is one of the aspects captured in both Table 15, “Insights into Sustainability Learning Programs”, and Table 16, “Characteristics of Sustainability Chefs”, of Chapter 9, which summarize key points under each of these headings derived from study participants’ responses.

Meare Village Primary’s School Development Plan supports achievement already made in the sphere of whole-school ESD initiatives, as instanced by their active engagement with “Kenyan schools, where they plan and deliver the curriculum alongside each other” (WWF, n.d. b, p. 1). Guidance for this type of visioning as a way of getting started within sustainability learning has been provided by Britain’s National College for School Leadership. Their *Leading Sustainable Schools: Getting started – Doorway booklet* (NCSL, n.d.) fleshes out the structure suggested in the DfES 2006b document for schools wishing to engage, while using the concept of the eight doorways and the notion of care in shaping a sustainable school.

The Ofsted ESD inspection two years later shows Meare Village Primary School continuing to perform at an outstanding level, with evidence such as “Pupils develop stewardship from an early age. They are expected to take responsibility. Pupils care for each other and for the environment” (Ofsted, 2008d, p. 2). Even though students in this school range from age 4–11, they have a good deal of power and influence towards change. HMI note:

Pupils are becoming more influential in changing behaviour both in the school, at home and in the community. For example, they are so involved in the ethics of fair-trade that they have often changed purchasing habits at home. In this case “pester power” has been used productively as has their attempt to improve road safety in the village (Ofsted, 2008d, p. 2).

These comments highlight the benefits from a whole-school approach involving efforts towards an increasingly wider circle of concern for all the individuals at Meare Village Primary School.

In their study, *Whole-School Approaches to Sustainability*, Kate Henderson and Daniella Tilbury

note that “Whole-school approaches to sustainability extend the focus of schools to connect with and actively participate in their local community” (Henderson & Tilbury, 2004, p. 39).

Just as Alphington and Meare Village Primary Schools have gone through visioning processes, so has Staunton-on-Wye, Hereford. The WWF school story about Staunton, “Building the Jigsaw” (WWF, n.d. a), outlines open communication among the full-time and part-time staff that work in this small, rural school. Reflecting the suggestion in *Smart by Nature* to invest in networks of relationships (Stone, 2009, p. 187), this school’s leadership realized that sustainability learning “went way beyond traditional ‘green issues’. ‘Your personality and personal relationships are really important when you are trying to take this forward’” (WWF, n.d. a, p. 1). HMI found that the general educational provision was outstanding, one part of this being the school’s work within the realm of ESD. “One of the major factors in pupils’ outstanding enjoyment of school is the excellent curriculum.... For example, the work done on education for sustainable development and the involvement of pupils in planning the new school building are exemplary” (Ofsted, 2009b, p. 5). This might be seen as an example of what Søren Breiting terms mental ownership, developed in part when an individual “can find their ‘fingerprint’ in the final outcome” (Breiting, 2008, p. 161). As this develops, it relates positively to the degree of participation by an individual (Breiting, 2008, p. 173).

Similar points were made in the Ofsted ESD inspection of Staunton-on-Wye, where HMI found that “Pupils are aware of the need to lead sustainable lives and to protect the environment. They are able to articulate their concerns and give reasoned opinions” (Ofsted, 2007c, p. 2). Significantly, “The pupils’ determination to make a difference is impressive” (Ofsted, 2007c, p. 2). This is brought forward in the following year’s report: “They are affronted when adults or older siblings waste energy or disrespect their environment” (Ofsted, 2008g, p. 2). It is HMI’s view that “The wide range of enrichment activities, including visits to places near and far, is a real ‘jewel’ in the curriculum. These opportunities have raised pupils’ awareness of the need to

look after and respect their environment” (Ofsted, 2008g, pp. 3–4). Meare Village Primary School registered as an EcoSchool in 2011, but Glebe School and Staunton-on-Wye Primary School were both registered in 2005 (Eco-Schools [England], n.d.). Staunton was awarded its fourth green flag in 2010 (Staunton Primary School, n.d.). Significantly, the WWF stories for these schools reveal how they are incorporating the EcoSchools program into a wholesale shift in culture, echoing insights into whole-school involvement offered by several study participants and captured in Table 15 of Chapter 9.

A stage model for learning for sustainability

The details of sustainability projects found in these four schools give some background for the range of endeavours to which Gayford would have been exposed while collecting his data at all 15 of the schools involved in his study. Beyond visual evidence of projects undertaken and associated school documents, the primary data for Gayford’s study were interviews with the pupils themselves. Over a period of 36 months spanning 2005–2008, he met twice a year with groups of 6–12 students for about 40 minutes at a time, representing students from Years 4, 5 and 6 in each primary school, and from Years 8, 9 and 10 in each secondary school, with the same pupils often attending (Gayford, 2009, p. 9). Using some approaches from participatory action research, discussions were flexible, with efforts to “maintain a balance between allowing pupils to set the agenda for the discussion and adopting an underlying pattern of questions” (Gayford, 2009, pp. 9–10). Often topics were covered such as “What the school does to make itself more environmentally sustainable; Where they learn about matters related to sustainability; What they think ‘environmental sustainability’ means” (Gayford, 2009, p. 9). Gayford outlines details of these discussions as the initial findings of the study, relating to pupils’ experiences regarding entities such as home and school, participating in school councils, engaging with curriculum, and motivational aspects.

Most significantly, however, the result of analysis of the primary data from interviews with pupils over three academic years has points directly relevant to this thesis. Gayford proposed a four-stage model regarding aspects of learning for sustainability which touched on “two parallel and interrelated dimensions”: “*content* (normally referred to as knowledge and understanding); and *process* (which includes competencies, abilities and actions)” (emphasis in the original; Gayford, 2009, p. 10). Progression from Stage 1, the outset stage, through Stage 4, a more developed stage, in relation to knowledge (content) were six qualities of “breadth, connections, consequences, thinking creatively, widening perspectives, rationale” (Gayford, 2009, pp. 10–11). Regarding progression from Stage 1 through Stage 4 in relation to action (process), which might entail direct environmental improvement or a range of abilities related to learning such as problem solving and taking responsibility, developing perspectives might encompass aspects of the following five descriptors:

1. The level of involvement in direct action intended to bring about environmental improvement. This includes the ability to cooperate and/or show suitable leadership skills;
2. The level of involvement in decision-making intended to bring about environmental improvement. This includes the ability to negotiate, to challenge appropriately or to offer alternative ideas with reasons;
3. The level of ability to show initiative in either of the above two areas;
4. The range over which relevant involvements take place. These include the school buildings and grounds, the local community, and involvements further afield regionally, nationally or internationally;
5. The level of ability to show independent thought (Gayford, 2009, p. 11).

The six descriptors regarding knowledge and five descriptors for action shaped what would become Gayford’s model showing trends in learning for sustainability.

The following table illustrates the various stages in Gayford’s model by following an aspect through for both knowledge and action.

Table 2***Illustration of Gayford's Four-Stage Model for Knowledge and Action***

Descriptors: Content knowledge and understanding	
Stage 1	“This seems to begin with awareness of a number of issues that impact on sustainability. The links to the bigger picture are not apparent, or where they exist they are very basically understood” (Gayford, 2009, p. 19).
Stage 2	“This stage appears to involve a more comprehensive range of issues that relate to sustainability, with an increasing appreciation of global issues. However, much of the understanding still focuses on the local environment, particularly the school buildings and estate” (Gayford, 2009, p. 20).
Stage 3	“At this stage a more holistic view of sustainability is emerging.... The implications of local actions are seen to have possible global impacts and vice versa” (Gayford, 2009, p. 21).
Stage 4	“The understanding is now much more holistic, with a large number of examples of factors affecting sustainability drawn locally, nationally and globally. This tends to give an appreciation that almost anything ultimately has an impact on sustainability” (Gayford, 2009, p. 22).
Descriptors: Process abilities	
Stage 1	“This includes direct involvement in environmental improvement activities, usually with careful and explicit direction from adults.... Activities also include practical conservation measures such as recycling and saving water and energy, but these are mainly promoted and initiated by adults within the school and the pupils take an interest in progress” (Gayford, 2009, p. 23).
Stage 2	“Direct involvement in activities to improve the environment and to conserve resources and energy continues as a feature at this stage, with more involvement in the decision-making process and in the generation of ideas” (Gayford, 2009, p. 24).
Stage 3	“The school and grounds continue to be the focus for much of the practical activity, including quite ambitious projects to enhance the environment.... Pupils are generally willing to participate, and this is enhanced by increased opportunities to become involved in the decision-making process and to monitor changes. Pupils are beginning to take a lead in this under the careful guidance of well-motivated teachers” (Gayford, 2009, p. 25).
Stage 4	“In this stage, the school buildings and grounds begin to emerge more clearly as an intended model for sustainable behaviour.... Pupils are clearly advocating behaviours that they see as environmentally sustainable, both within and outside the school – particularly at home, where they may be taking the lead” (Gayford, 2009, p. 26).

Gayford's model considers the two aspects of knowledge and action separately for pupils, but movement through the stages suggests a trend of a more developed facility with sustainability.

The progression outlined in Gayford's four-stage model is developed across type of school (primary or secondary), location (e.g., rural or urban), and gender or background of students, possibly pointing to underlying trends regarding learning for sustainability that work beyond these dimensions.

In 2011, William Scott, a British educator, wrote a review essay in *EER*, “Sustainable Schools and the Exercising of Responsible Citizenship”, touching on Gayford’s study while considering it alongside others, such as Ken Webster and Craig Johnson’s *Sense and Sustainability: Educating for a Low Carbon World* (2010). In his work, Scott tends to pose difficult questions, or ones that relate to responses that may take a long period of time to develop, and this article is no exception. For instance, he asks a curriculum question:

All this exposes a central question for those involved: at heart, are you really interested in educational or behavioural outcomes? Do you want the main focus to be on what learners learn (viewed very broadly), or on behavioural change, for example, reducing energy consumption? (Scott, 2011, p. 414).

Some might consider this question to represent an old tension in this field. The possibilities of pursuing one outcome type within the other is what Scott refers to as an articulated framing (Scott, 2011, p. 411).

The reason that the question is difficult and that it has been around for some time is that many educators involved in learning for sustainability find themselves caught between dual allegiances: authentic learning versus environmental impact of various behaviours. As in so many cases where proscriptive behaviours appear, they may be informed by a fear that their absence will mean the appearance of an intolerable situation. Where the environment is concerned, this incorporates irreversible changes to life on the planet, with all the suffering that entails. Facing this stark reality can instill such strong fear in individuals that they may behave in more extreme ways than otherwise. Educators drawn to the belief that answers to so many difficult questions are found within the learning process itself may become attached to controlling the outcome of learning experiences, to the extent that they would dictate students’ and others’ behaviours. Associated with this is a drive to find what might be seen as the most useful of best practices so that these would be the ones they would proscribe. There is much evidence to show, however, that success is found in a return to a stance of trust in the learning

process and the belief that individuals will develop the skills and methods to apply solutions to their unique set of conditions in determining the most reasonable behaviours with respect to the environment. Study participants touch explicitly on this issue and the extended time perspective implied, which is also integral to the long view to be described in Chapter 8:

Maybe you won't see the change now ... and maybe you won't ever see the change yourself, but at some point in time, it might click in for them (CA-Teach5, p. 4).

If you can influence children when they are young, maybe not in this time, but maybe later in their lives, they will return to it, to nature (LT-Teach6, p. 1).

The movement suggested here is reflected in the literature of this field, which over a dozen or so years has moved beyond what Huckle and Sterling outlined in *Education for Sustainability* (1996), through to two interrelated and complementary approaches to ESD, what Vare and Scott suggest might be termed learning *for* sustainability (ESD 1), to approach ESD 2, or what they describe as learning *as* sustainability (Vare & Scott, 2007, 2008). In some ways, the suggested shift might be found in Stephen Sterling's *Sustainable Education: Re-visioning Learning and Change*, where he launches from Herman Daly's 1996 publication, *Beyond Growth*:

In his analysis of conventional economics, Herman Daly calls for a shift from the information economy to the "wisdom economy". We have a parallel and related challenge, to shift from "information education" to "wisdom education". Time is short, and we need to summon all our existing wisdom to choose and enact this change (Sterling, 2001, p. 88).

The results of the project outlined in the remainder of this thesis represents work positioned within this arena of gaining a living responsiveness to the environment through the context of learning.

Conclusion

This chapter began by framing the learning context through the foci of valuing less protocol-based approaches, meaning through language in ESD, its predecessors and cousins, and perceiving the world through love rather than loss. The core discussion of the chapter then started with a sense of wonder, or connection to the environment, as a prerequisite to qualities of thinking, particularly for sustainability cognition, before outlining the means of engagement when creating a liveable future. Although much literature in the field of ESD or sustainability learning has a strong focus on specific knowledge and action, the suggestion is that the process of bringing about an improved balance regarding the environment needs to be accompanied by both a holistic sense of connection to and systemic thinking about the environment. In fact, these three threads are sufficiently interrelated that considering them separately may itself be something of a construct. In response to the question that Phil Champain used to title a chapter in a WWF publication on environmental education, “Why Bother with Environmental Education?” (Champain, 1996, p. 13), this discussion has pointed to real means by which learning for sustainability may be a route towards shaping a liveable future, especially given that evidence exists for this being the case. A graduate of a sustainable school might therefore be connected to the environment and individuals around them, make use of sustainability cognition in building perceptual and conceptual connections, and creatively engage with real solutions through action to bring about a liveable future.

Chapter 4:

Research Methodology

Introduction

This chapter discusses methodology: it locates the research undertaken for this thesis in the field and describes the methods chosen, covering methods mentioned in the literature as well as those developed in the course of my analysis for the purpose of gaining the greatest clarity from the data. Input for the methodology has been taken from various sources. Some ideas have sprung from writings that make up the core of mainstream qualitative research (Denzin & Lincoln, 1994; Glesne & Peshkin, 1992; Lincoln & Guba, 2001; Merriam, 2002; Miles & Huberman, 1994; Patton, 1987, 2002; Schwandt, 2001), while specifics have been provided for others regarding certain techniques or approaches (Bernard & Ryan, 2010; Carr & Kemmis, 1986; Holstein & Gubrium, 2002). Some methods arise from writings in the subfield of case study research (Stake, 1995, 2008; Yin, 1994), while others are situated within areas more distantly related to this research such as (participatory) action research, grounded theory, ethnography or even philosophy (Geertz, 1973/1975; Glaser & Strauss, 1967; Kemmis & Wilkinson, 1998; Kindon, Pain & Keasby, 2007; Reason & Bradbury, 2001; Ryle, 1968/1971). There were times when the best help I found in working with the data was not in any text relating to methods at all, but rather through thinking more laterally about the data, finding help in the writings of the American chef Julia Child (1961/2008), the British furniture maker David Linley (2000), and the American Zen Buddhist Roshi Bernie Glassman (1996, 1998). Creativity in methodology is an approach endorsed by a number of qualitative researchers, as touched on at various points in this chapter.

Reflecting the title of their 1992 book, *Becoming Qualitative Researchers*, Glesne and Peshkin state that “*Becoming* a better researcher captures the dynamic nature of the process.

Conducting research, like teaching and other complex acts, can be improved; it cannot be mastered” (emphasis in the original; Glesne & Peshkin, 1992, p. xiii). Collecting, analyzing and reporting the outcomes and findings of the data associated with this thesis project have been processes requiring guidance from quite disparate sources. The intention of listening to these varied voices is to find ways to blend them, one in harmony with another, in a way that would allow the whole story of the long ballad to emerge from the available data. Glesne and Peshkin suggest that data analysis is about finding your story, as it “involves organizing what you have seen, heard, and read so that you can make sense of what you have learned. Working with the data, you create explanations, pose hypotheses, develop theories, and link your story to other stories” (Glesne & Peshkin, 1992, p. 127). The idea of stories being central to research is touched on again as they quote Pachter (1981, p. 72): “One may merely know that no one is alone and hope that a singular story, as every true story is singular, will, in the magic way of some things apply, connect, resonate, touch a major chord” (Glesne & Peshkin, 1992, p. 151). The following sections outline the general context in which this research is found, the actions taken in the research regarding data collection and analysis, and general considerations regarding what constitutes good qualitative research and limitations in this study.

Methods Context

This section sets the context for the research through a discussion of the field in terms of the research paradigms that constitute qualitative research as well as the role of the researcher. Should labels be helpful for clarification, this work is qualitative research generally and case study research more specifically, with the result that I am a qualitative or case study researcher. However, it was Robert Stake, in his final ‘Reflections’ in *The Art of Case Study Research*, who points out the degree to which research and researcher present a unique dyad. “Researchers do not step outside their ordinary lives when they observe and interpret and write up the workings of

a case.... Each researcher's style and curiosity will be unique in some ways" (Stake, 1995, p. 135). Stake explains:

Qualitative case study is highly personal research.... The way the case and the researcher interact is presumed unique and not necessarily reproducible for other cases and researchers. The quality and utility of the research is not based on its reproducibility but on whether or not the meanings generated, by the researcher or the reader, are valued (Stake, 1995, p. 135).

Research Paradigms and Traditions

At the outset of *Qualitative Research in Practice*, Merriam frames the field of qualitative research by saying that: "The key to understanding qualitative research lies with the idea that meaning is socially constructed by individuals in interaction with their world" (Merriam, 2002, p. 3). Among the many ways of styling qualitative research, Merriam points out the variety of means of discussing them, from the types of questions asked, the traditions represented, or the research strategy chosen.

Writers of qualitative texts have organized the diversity of forms of qualitative research in various ways. Patton (1990), for example, presents ten orientations to qualitative research according to the different kinds of questions researchers from different disciplines might ask. Creswell (1998) has identified five "traditions" – biography, phenomenology, grounded theory, ethnography, and case study. Tesch (1990) lists forty-five approaches.... Denzin and Lincoln (2000) identify eight research strategies of case study, ethnography, phenomenology, grounded theory, biographical, historical, participatory, and clinical. They write that qualitative research "does not belong to a single discipline. Nor does qualitative research have a distinct set of methods that are entirely its own" ([Denzin & Lincoln, 2000,] p. 6) (Merriam, 2002, p. 6).

The organization of the resource book that Merriam edited is "around eight of the more commonly used approaches to doing qualitative research: basic interpretive, phenomenology, grounded theory, case study, ethnography, narrative analysis, critical, and postmodern-poststructural" (Merriam, 2002, p. 6). Most of these are relevant to an interpretive qualitative approach in research, a style that would include the present study.

In comparing the interpretive qualitative approach and the critical qualitative approach, she clarifies that "Learning how individuals experience and interact with their social world, the

meaning it has for them, is considered an interpretive qualitative approach” (Merriam, 2002, p. 4). Carr and Kemmis state that in interpretive research, “actions have meaning in relation to the understandings” (Carr & Kemmis, 1986, p. 93). Merriam identifies the following characteristics as cutting across the various interpretive qualitative research designs: researchers “strive to *understand meaning* people have constructed about their world and their experiences”; “*the researcher is the primary instrument* for data collection and data analysis”; “researchers undertake a qualitative study because there is a lack of theory or an existing theory fails to adequately explain a phenomenon ... the process is *inductive*; that is, researchers gather data to build concepts, hypotheses, or theories” (emphasis in the original; Merriam, 2002, pp. 4–5). Many of these characteristics apply to the research in this study, in particular the idea that I was the primary instrument for data collection and analysis, much of which was inductive.

Huberman and Miles state that “At the heart of analytic induction is the thesis that there are regularities to be found in the physical and social worlds” (Huberman & Miles, 1994, p. 431). At the outset of data collection, the regularities were thought to be in the content of ESD evidenced during school visits. What arose soon after embarking on analysis was the greater significance of awareness of the regularities of the process of fostering sustainability; that is, the general approaches adopted by participants showed striking regularities beyond the specifics of the learning experiences provided. For those interested in research undertaken within the interpretive approach, Merriam provides guidance for choosing among styles of research. “If your primary interest is in understanding a phenomenon, you have many options, the most common being grounded theory, phenomenology, narrative, ethnography, case study, or just a basic interpretive study” (Merriam, 2002, p. 4). Although this study is primarily located as a case study and is least representative of ethnography, the work presented in this thesis does in fact have features in common with many of the other styles of qualitative research mentioned in this list.

Merriam provides short descriptions of each of the dominant types of qualitative research, five of which provide resonances with this study at various points of its evolution. However, one type that she does not mention is participatory action research (PAR). Kindon, Pain and Kesby cite Wadsworth's 1998 definition of PAR as "an umbrella term covering a variety of participatory approaches to action-oriented research. Defined most simply, PAR involves researchers and participants working together to examine a problematic situation or action to change it for the better" (Kindon, Pain & Kesby, 2007, p. 1). Kemmis and Wilkinson also address this notion of change working both ways as they state that "participatory action research aims to help people to investigate reality in order to change it (Fals Borda, 1979). At the same time, we might say, it also aims to help people to change reality in order to investigate it" (Kemmis & Wilkinson, 1998, p. 21). While other iterations of this research might be usefully completed within the framework of action research or PAR in the future, this was not done in the present study.

A number of Merriam's brief descriptions of qualitative method types do resonate with the approach taken in this study. For instance, her description of a basic interpretive and descriptive qualitative study raises issues such as the following: "the researcher is interested in understanding how participants make meaning of a situation or phenomenon, this meaning is mediated through the researcher as instrument, the strategy is inductive, and the outcome is descriptive" (Merriam, 2002, p. 6). She describes how "data are inductively analyzed to identify the recurring patterns or common themes that cut across the data" (Merriam, 2002, pp. 6–7). This study also has characteristics of phenomenology. Merriam cites Patton's description in his *Qualitative Evaluation Methods* (1990, p. 70) regarding the type of research that is considered phenomenology, where "there is an essence or essences to shared experience.... The experiences of different people are bracketed, analyzed, and compared to identify the essences of the phenomenon, for example ... the essence of being a participant in a particular program"

(Merriam, 2002, p. 7). Barney Glaser and Anselm Strauss's 1967 book, *The Discovery of Grounded Theory*, is seen as shaping "qualitative research as a viable research paradigm" (Merriam, 2002, p. 7). Glaser and Strauss state their intention within their preface: "We argue in our book for grounding theory in social research itself – for generating it from the data" (Glaser & Strauss, 1967, p. viii). As will be seen in the meta-analysis of the penultimate chapter of this thesis, a suggested means of appreciating participants' views regarding sustainability is generated from the data themselves. Merriam's description of grounded theory is echoed in the approach taken in this study, as she states: "Data gathered for a grounded theory study are analyzed via the constant comparative method of data analysis.... A grounded theory consists of categories, properties, and hypotheses that state relationships among categories and properties" (Merriam, 2002, p. 8). Regarding the narrative analysis approach, the statement with which the approach taken in the present study resonates is Merriam's explanation that "the story is analyzed in terms of internal thoughts and motivations" (Merriam, 2002, p. 9). Merriam suggests that with case study research "it is the unit of analysis that determines whether a study is a case study" (Merriam, 2002, p. 8). For this study, the EcoSchools program in each nation can be seen as the unit of analysis. That said, the experience of conducting the interviews and analyzing the participants' responses led to something of an enlargement in scope to include sustainability education programs more generally, since much of what the participants shared went beyond the specifics of a given program; and indeed a couple of participants explicitly stated as much:

If school is sustainable, that is most important – not what we do, but how we do it. EcoSchools program just gives means for school to be more and more sustainable (LT-Coord, p. 53).

Main goal isn't to keep the Green Flag, it is to develop our work. Concentrate on research and look for reasons why these things are happening (LT-Admin2, p. 11).

As Merriam's resource book is a sizeable text on the varied field of qualitative research, it is important that one of the final points she makes in its introduction is to underscore the thread of harmony moving through the subfields: "All these types of qualitative research have in common the search for meaning and understanding" (Merriam, 2002, p. 15). This thread of continuity among described approaches also holds true with the research presented in this thesis.

For the subfield of case study research, the work of both Robert Stake and Robert Yin comes to the foreground. Thomas Schwandt suggests that Yin "argues that a case study strategy is preferred when the inquirer seeks answers to how or why questions ... [whereas] Stake emphasizes that the foremost concern of case study research is to generate the knowledge of the particular" (Schwandt, 2001, p. 23). At the outset of Robert Yin's section on a common definition for a case study, he cites Schramm's 1971 description: "the essence of a case study, the central tendency among all types of case study, is that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result" (Yin, 1994, p. 12). Many of these features can be seen in this thesis. Yin suggests that "Establishing the how and why of a complex human situation is a classic example of the use of case studies" (Yin, 1994, p. 16). Stake outlines three styles of case study, the intrinsic, the instrumental, and the multiple or collective case study (Stake, 2008, p. 121–123). Of these, the present research might be considered a multiple case study. Schwandt goes on to say that "Both Stake and Yin argue that case studies can be used for theoretical elaboration or analytic generalization" (Schwandt, 2001, p. 23). Michael Patton also cites Stake (2000, p. 436) in his delineation of a case study, stating: "Cases can also be critical incidents, stages in the life of a person or program, or anything that can be defined as a 'specific, unique, bounded, system'. Cases are units of analysis" (Patton, 2002, p. 447). In an interesting personal communication, Robert Stake shares what Alan Peshkin said to him:

I mean to present my case so that it can be read with interest in the case itself, but I always have another agenda – to learn from the case about some class of things. Some of what that will be remains an emergent matter for a long time (Stake, 2008, p. 124).

The experience I had in this thesis project was similar to the one Peshkin relates. The outset of the project was marked by my belief that the majority of the work I would be doing related directly to adult program participants' experiences around successes and challenges regarding the EcoSchools program, whereas, with the passage of time, its concluding phase was identifiable through the shift in perspective to the importance of the individual sustainability frameworks and perspectives that shaped the program I saw being implemented in the three nations.

Role of Researcher

Many researchers discuss the role of the researcher and clarify the importance of various skills of the researcher in developing good qualitative research. Issues raised in this section are particularly relevant to this thesis due to the combination of my own role as a primary instrument and the fact that the interval of time covering data collection, analysis and write-up in this project has extended over six years. This is a sufficiently long period that my own enthusiasms, thought processes, and skills have shifted, making this section perhaps more relevant than it might otherwise have been. Robert Stake expresses that research “is interactive communication, first between a single researcher with the case, later with the reader. The exercise is partly commiseration, partly celebration, but always intellectualization, a conveying, a creating of meaning” (Stake, 1995, p. 136).

Robert Yin outlines desired skills for the case study investigator, which include question-asking, listening, adaptiveness and flexibility, a grasp of the issues being studied, and a lack of bias (Yin, 1994, pp. 55–59). An interesting feature is that “Listening includes observing and sensing more generally and is not limited to the aural modality. Being a good listener means

being able to assimilate large amounts of new information without bias” (Yin, 1994, p. 57). His view is that:

the demands of a case study on a person’s intellect, ego, and emotions are far greater than those of any other research strategy. This is because the data collection procedures are *not* routinized.... In fact, a point to be emphasized ... is that the skills required for collecting case study data are much more demanding than those for experiments and surveys (emphasis in the original; Yin, 1994, p. 55).

My own experience, as outlined in this chapter, is that methods needed to be employed of both kinds: ones that others had championed, as well as those less routinized ones that I developed.

In the section of concluding reflections, Miles and Huberman point to the irregularities often found in qualitative analysis and the need for skill in the researcher in dealing with such situations.

We believe that methodological quagmires, mazes, and dead ends are not necessarily a product of researcher incapacity, but of qualitative data themselves. Like the phenomena they mirror, they are usually complex, ambiguous, and sometimes downright contradictory. Doing qualitative analysis means living for as long as possible with that complexity and ambiguity, coming to terms with it, and passing on your conclusions to the reader in a form that clarifies and deepens understanding (Miles & Huberman, 1994, p. 309).

This excerpt from Miles and Huberman puts voice to much of my own experience regarding the process of working with the data for this thesis. My experience also agrees with Merriam’s statement: “Expect to learn about yourself.... Qualitative research cannot help but to have an impact on the researcher in often unanticipated ways” (Merriam, 2002, p. 421). Hilary Bradbury makes a similar point as she explains “In many ways this study ... is also about the change that I, as a researcher, underwent and which therefore fashioned the lens which allowed me to tell the story I told” (Bradbury, 2001, p. 311).

Miles and Huberman report the importance of working with real data in real situations, rather than waiting for the ideal to arise. They say of data that they can be “...equivocal, sometimes unfathomable. [Researchers] make intuitive leaps when looking at data outputs ...

[and] get better at their work by learning how to contend with these normal problems, not by seeking for an ideal design and a fully spelled-out conceptualization” (Miles & Huberman, 1994, p. 309). As will be shared in an excerpt from field notes below, seeing real data can invite a response of wishing the project design had been different. However, to borrow a phrase from Bradbury and Reason (2001), this might be seen as a choice-point rather than a failure, in acknowledging a willingness to work with data that reflect the reality of the present conditions, rather than chasing design perfection.

Miles and Huberman go on to outline that “The core requisites for qualitative analysis seem to be a little creativity, systematic doggedness, some good conceptual sensibilities, and cognitive flexibility” (Miles & Huberman, 1994, p. 309). In their concluding advice, they provide a number of final thoughts that apply strongly to my analytical process with the data, including “Think display; be open to invention; entertain mixed models” (Miles & Huberman, 1994, p. 310). In particular, they advise “Patience, trying to do things better, and sharing” (Miles & Huberman, 1994, p. 310). As well, they point out the necessity to:

Stay self-aware. Our own experience showed us vividly how useful it is to maintain a part of your attention on the process involved in analysis.... Only through such sustained awareness can regular self-correction occur – not just during specific analysis episodes, but over time, as the methods themselves iterate and develop. We have suggested supports for self-awareness in the form of documentation logs and – perhaps most essentially – “critical friends” who can supportively counter your taken-for-granted approaches and suggest alternatives (emphasis in the original; Miles & Huberman, 1994, p. 310).

I count myself as one of those lucky graduate students who had a variety of communities in which I found critical help from friends and colleagues. I met with my supervisor at many points over the course of the journey involved in this project and gained critiques from these formal meetings that shaped my work. I discussed my ideas and shared some of my quandaries with experts dispersed within my faculty and others at the University of Toronto, as well as at universities further afield and at conferences in the United States, Sweden, and the United

Kingdom. I benefited from the listening ear of my family members, including my husband, father, brother, an aunt and an uncle, and in particular one of my cousins who went through the doctoral process in a different field and has subsequently led a number of her graduate students on their way. My various friendship groups have provided informal contributions which have also had their place in critiquing my process and my outcomes and findings, displaying a wonderful tolerance for the protracted pet conversation which has been my thesis. These various circles of influence have helped me to stay self-aware while bringing energy to the thesis process.

Methods in Action

This section outlines the actions taken regarding methodology for both collecting and analyzing data. Although these aspects are separated into different sections, Glesne and Peshkin cite Gordon (1969/1975) in revealing the extent to which data collection, analysis and reporting are part of one whole:

There really is no way to separate the parts of research from one another. Data gathering includes parts of analysis, analysis leads to more data, writing leads to a greater understanding of both analysis and data. The process is totally holistic, each piece absolutely necessary to the whole (Glesne & Peshkin, 1992, p. 148).

In approaching the operationalization of methodology, Stake makes an excellent point that “Perhaps the simplest rule for method in qualitative casework is this: ‘Place your best intellect into the thick of what is going on’” (Stake, 2008, p. 128).

Collecting Data

This section outlines methods involved in moving from the initial collecting of data to investigate the research questions, to the point of embarking on the analysis of the data.

Research questions

The development of the research questions and case selection for this study were outlined in Chapter 1 in the Research Focus section. Issues regarding the research question are discussed, as are selection issues regarding both the choice of the EcoSchools program as well as the three nations.

Pilot study

Glesne and Peshkin explain that “During a pilot study, you test your questions, your ways of relating to your respondents in general, and your ways of interviewing them in particular” (Glesne & Peshkin, 1992, p. 68). As there were a limited number of certified secondary EcoSchools in Toronto, I chose to seek permission to visit a local private-sector secondary school that had developed a comprehensive sustainability program for my pilot study. I met with nine people, including administrators, teachers, sustainability curriculum specialists, and caretakers, and recorded eight of these interviews. The timing would allow me to complete the interviews and gain a sense from the data in time for revision of the interview protocol before my departure overseas at the end of February, 2006. In many ways, although the intention was to create a pilot study for this research project, what actually took place might be closer in style to what Robert Yin refers to as a “pretest”. In comparing the two, he clarifies:

The pilot case is used more formatively, assisting an investigator to develop relevant lines of questions – possibly even providing some conceptual clarification for the research design as well. In contrast, the pretest is the occasion for a formal “dress rehearsal”, in which the intended data collection plan is used as faithfully as possible as a final test run (Yin, 1994, p. 74).

It was not until some point later that I realized that some of the qualities that had attracted me to the pilot study school were the very qualities that might mean that my interview protocol was not being as thoroughly tested as it might have been if other schools had been available to me. In particular, the interviews I conducted at the pilot school did not reveal to me any problems with the language of the interview schedule. Perhaps this was due in part to the fact that the majority

of the pilot participants were professionals in the sustainability field rather than the teacher experts I would find at the schools included in the study proper.

Glesne and Peshkin make an excellent point: “Do not confine this testing process to a formally designed pilot study period, because your ‘real’ interviews will also provide continuing opportunities for learning and revising” (Glesne & Peshkin, 1992, p. 68). Their warning was brought home for me when I found that the interview protocol that had been approved through the various university administrative levels and had been used in the pilot would need to be changed while I was on my research trip due to problems detected in the first interview regarding both language barriers and a sense of difficulty in authentically engaging the participants in the short time available to me. The solution was to simplify the questions for language on the topic of sustainability, particularly bearing in mind the cross-cultural nature of the interviews, and to engage the participants to a greater degree through the use of a projection technique.

Triangulation

Yin suggests that using multiple sources of evidence supports findings. He outlines that “Data collection for case studies can rely on many sources of evidence. Six important ones are ... documentation, archival records, interviews, direct observation, participant-observation, and physical artifacts” (Yin, 1994, p. 78). Of interest when comparing the strengths and weaknesses of these six sources of evidence is that “You should immediately note that no single source has a complete advantage over all the others. In fact, the various sources are highly complementary, and a good case study will therefore want to use as many sources as possible” (Yin, 1994, pp. 79–80). The link between triangulation and research quality issues is made by Huberman and Miles, who say that triangulation involves “multiple measures that ensure that the variance reflected is that of the trait or treatment and not that associated with the measures”; eventually it appears to be “less a tactic than a mode of inquiry” (Huberman & Miles, 1994, p. 438).

While Yin suggests six sources, Merriam suggests three: “There are three major sources of data for a qualitative research study – interviews, observations, and documents” (Merriam, 2002, p. 12). While on site at each school, it was my hope to conduct interviews with each participant, to observe and photograph aspects of their project as participants might guide me around the school site, and to collect relevant documents that related to their program. Documents might range from green school statements, curriculum, and project outlines, to certification reports. This type of collection strategy is in agreement with Merriam’s suggestion: “The data collection strategy used is determined by the question of the study and by determining which source(s) of data will yield the best information with which to answer the question” (Merriam, 2002, p. 12). In the end, various documents were collected at different schools and direct observations were made at each school of the practices in place which were often accompanied by photos if they could be taken while preserving the anonymity of the site and participants. However, the only source of data available for every participant was from the interview itself. It was deemed important to focus on the type of data source most consistently available, so the source of evidence for this study was narrowed to interview data. Interestingly, Schwandt suggests a slightly alternative view of triangulation in that it is “a means of checking the integrity of the inferences one draws. It can involve the use of multiple data sources, multiple investigators, multiple theoretical perspectives, multiple methods, or all these” (Schwandt, 2001, p. 257). In the present study, due to the limitations regarding consistent data, working with data from three different nations provided different perspectives on the phenomena as a primary mode of triangulation. While the original comparative intention of the study had been to explore national differences in implementation of an international program, as the study evolved the value of choosing multiple nations proved to reside much more in the unexpected degree of similarity in the patterns emerging from the interview data.

Nations chosen

At the outset of the study, the choice of nations seemed particularly important in light of the comparative emphasis envisioned at that time. However, the study's subsequent unfolding entailed comparative aspects moving to the background as the focus shifted to the development of a model of sustainability perspectives emerging as a common pattern from the responses of individuals from all three nations. That said, choosing nations based on both common and distinctive characteristics was useful in more thoroughly grounding the model as being applicable across national boundaries.

The choice of the nations of Canada, Lithuania and Sweden was made from an ecological economics macro-analysis of environmental impact with wealth, with the hope that the micro-level of environmentally astute choices and actions that would inform the macro-level might be determined. At the outset of this research, the links between macro- and micro-levels seemed important. A graph illustrating these relationships was included in the joint publication by researchers from Yale and Columbia Universities of the *2005 Environmental Sustainability Index*. Their report showed that Canada and Sweden were both wealthy nations with slightly different environmental impacts (both nations in cluster 3), with Lithuania's economy and environmental impact both being intermediate (in cluster 4) (Esty, Levy, Srebotnjak & de Sherbinin, 2005, p. 26). The choice of three nations, and these three nations in particular, would allow for a type of triangulation from both intra- and inter-cohort comparisons. In practice, while some triangulation was done, as described towards the end of Chapter 7 (see Tables 13 and 14), the initial notion of a comparative study was largely set aside to delve further into the range of perspectives among the participants at EcoSchools in these nations. Looking at similarities rather than differences, the fact that Sweden and Lithuania were both Baltic nations supported their choice, being close in both geographical proximity and some educational efforts such as the Baltic Sea Project. One of the authors very kindly gave me a copy of an unpublished version of

this graph in colour which illustrated the cohort membership even more clearly. As all three of these nations engaged in a version of the EcoSchools program, the major choices around the case study were then made.

Process considerations

In her chapter “Learning with *The Natural Step*” within the *Handbook of Action Research* (Reason & Bradbury, 2001), Hilary Bradbury mentions a number of points that were similar to my own research experience. It appears that the links between micro- and macro-levels were central to her research, although her directionality was from micro- to macro-level.

I theoretically linked practices at the micro-interpersonal level with more macro-institutionalized structures.... I reasoned, for example, that developing interpersonal competencies of dialogue would be an important leverage point for the re-patterning of action among key stakeholders in the shift towards sustainable development; in other words, emergent change at the micro-level could shift the macro-dynamics of a system towards more sustainable practices (Bradbury, 2001, p. 307).

Wilfred Carr and Stephen Kemmis also discuss the interaction of macro- and micro-levels or perspectives in their book *Becoming Critical*. They discuss how “For many years, curriculum theorists have studied the relationship between *curriculum* and *culture*” (emphasis in the original; Carr & Kemmis, 1986, p. 21). They go on to say that many educators and researchers take the view that “education has a role in reshaping society” (Carr & Kemmis, 1986, p. 22). The aspect of culture in my own study is its sustainability, and the hope is that learning, particularly through the formal education system, may support individuals in more sustainable choices. My choice of nations revealed my belief: if curriculum shaped culture, then the reverse might also be true and detectable, where the relative sustainability of a culture at the macro-level might trace to the micro-level of activities in schools of that nation.

Another point that Bradbury raises is that the intent of the research was to focus on content, but this shifted to a focus on process, ultimately allowing her to “anchor sustainable development in its dynamo of attractive conversations in personal networks” (Bradbury &

Reason, 2001, p. 451). The paradigm shift from content to process was deemed “The most important result of the action research work with *The Natural Step* [which] began with a realization that occurred to one of the interviewees during the dissemination meeting” (Bradbury, 2001, p. 309). This interviewee shared:

I realize that what is special about *The Natural Step* is the process [with which] they continually engage and transform the business leaders, it’s not so much the content of the teaching as I had thought; it’s this process which is always ongoing (Bradbury, 2001, p. 309).

In the research in this study, this same shift took place in working through the data analysis, where the emphasis was less on the content of what was being shared, and more on the process shaping the content. The modes of data analysis began to reveal the process that was going on, ultimately allowing the model of sustainability perspectives to emerge, as well as participants’ views and how they worked together.

Interviews

The word generally used when referring to those individuals engaging in this research is “participant”, although different researchers may use various terms. For instance, “others” is used by Glesne and Peshkin in preference to terms such as subjects, research participants, respondents, and interviewees (Glesne & Peshkin, 1992, p. xi). For the purpose of protecting participants’ anonymity, all were assigned a code that related to their job role at the school and numbered in the order interviewed. The second Swedish school visited, SV-2, is where colleagues SV-Admin2 (the second administrator interviewed in Sweden) and SV-Teach2 (the second interviewed Swedish teacher) were based (see Appendix P for a complete list of site and participant codes). Although the three national coordinators consented to being identified by name, for the sake of consistency in most instances I have indicated Marsha Yamamoto as CA-Coord, Egidijus Čibirauskas as LT-Coord, and Anna Normann as SV-Coord. A point to note is that the Canadian coordinator is taken to be Marsha Yamamoto rather than Steve Bibla, the

individual in the role after she left, as it was Marsha who was involved in the certification of each of these schools for the academic year of my formal research. Additionally, I met with the four individuals representing the TDSB EcoSchools program coordination team, but none were available for individual formal interviews. Steve Bibla very kindly allowed me to join him on his annual school visit to the Toronto secondary schools in this study, which took place over a few days in early June, 2006, and in all cases were after my own visit to the school for the research interview.

The following table provides a summary of the participants by nation and role.

Table 3

Summary of Participants by Nation and Role

Role	Canada	Lithuania	Sweden	Total
Coordinators	1	1	1	3
Administrators	2	5	2	9
Caretakers	0	1	1	2
Lead teachers	7	7	2	16
Participants (total)				
	10	14	6	30
Schools				
	4	4	2	10

Of the 30 participants, almost half were Lithuanian, and the majority of individuals were teachers; ten were men and 20 were women. The following figure correlates the participants' ages (identified as the midpoint of a decade, e.g. 25 for a participant in her 20s) with their years of experience in the field of education, broken down by nation (l) and by role (r), as indicated through symbols. As may be seen, the Lithuanian cohort is the most experienced at a given age as well as the oldest, indicating a trend to become involved in education early and stay with it, while the Swedish participants are the least experienced for their age, suggesting a tendency for their educational roles to be second (or later) careers. Administrators tend to be both older and

more experienced, while national coordinators are generally on the younger side and (with the exception of CA-Coord) new to the field of education.

Figure 5. Participants' ages and years of experience (l) by nation; (r) by role.

Further information regarding the participants' background is outlined in the results of the next chapter.

All of the interviews took place in a quiet office or school classroom according to the schedule outlined in Appendix A. The shortest interview was 45 minutes in length, while the longest was 375 minutes, with an average of 76 minutes. Almost all of the Canadian and Lithuanian EcoSchools were visited on two different days, whereas only a single day's visit was possible at the Swedish schools. At each school, tours of the site were made, allowing me to observe sustainability efforts in the general school areas, classrooms, and the school structure, as well as outside the school.

If the case is the EcoSchools nation and the nations were chosen to be Canada, Lithuania, and Sweden, the total number of participants in the interviews was determined primarily by the number of certified EcoSchools in each nation. My professional background as a secondary science teacher drew me to visiting those secondary schools engaged in the program. The result of ethical review processes undertaken with the University of Toronto and the TDSB effectively limited my research to adults (those above the age of 18). The first schools to be certified in the EcoSchools program in Toronto and in Lithuania were in 2005, while the EcoSchools program had been running in Sweden since 1996. According to the national coordinators and the programs' web presence, at the time of the research proposal there were five secondary schools in Toronto certified in the TDSB EcoSchools program, five certified EcoSchools secondary schools across Lithuania, and 406 certified EcoSchools at the secondary level in Sweden. The program has continued to expand rapidly, with an increase of certified EcoSchools in Lithuania of 15-fold in the second year of the program, while the number of certified EcoSchools in the TDSB had grown to 426 schools by the end of the 2011–12 school year, of which 62 were secondary schools (TDSB, n.d. b, n.d. c), a twelvefold increase over the number of certified secondary schools in the 2005–6 school year and 57 per cent of the 108 secondary schools in the TDSB. The goal was to involve in the data collection for the research in the spring of 2006 at least three of the certified EcoSchools in each nation. The interviews were to involve the program coordinators along with the staff involved in roles of the schools' EcoSchools committee of administrator, teacher and caretaker, resulting in at least 30 participants overall. The actual data collected are the result of formally interviewing 30 participants: three national coordinators plus nine Canadians from four schools, thirteen Lithuanians from four schools, and five Swedes from two schools.

The limited number of schools available for this research at first appeared to be a problem. Perhaps it is symptomatic of programs moving through growth transitions, but my

experience of accessing schools in the three nations was somewhat varied. The process of access in each case was facilitated with a combination of information publicly available on the Internet (<http://ecoschools.tdsb.on.ca/>; <http://www.eco-schools.org/>; <http://www.zalieji.lt>; Keep Sweden Tidy, n.d.) about the EcoSchools program as well as guidance from the national coordinators. In Toronto, the EcoSchools program is managed through the Toronto District School Board; overseas, the program finds its base with the Foundation for Environmental Education (FEE), presently coordinated through offices in Copenhagen, Denmark (FEE, n.d.) although at the time of the research trip it was located in Lisbon, Portugal. The national programs are handled by local groups, such as the Lithuanian Green Movement (Lietuvos Zaliuju Judejimas) based in Kaunas, Lithuania, and the Keep Sweden Tidy Foundation, based in Stockholm, Sweden.

Requested access was gained to each certified Canadian and Lithuanian school, but access to the Swedish schools was more challenging. Of the large official number of certified schools in Sweden, many of which were located in Stockholm itself where I hoped to base my Swedish research, not one Stockholm school was available to participate in this research. Of the two schools that did participate, one was in the suburbs near Stockholm and was designed for students with special needs, and the other was in a small town a short distance from Stockholm, accessible to me by train. The Swedish program coordinator was contacted at the same time and in the same manner as the coordinator in Lithuania, but the differing results probably speak mostly to the vagaries of research, an issue encountered by others as well (Gayford, 2009; Miles & Huberman, 1994). In the final analysis, the number or type of school in Sweden mattered less than anticipated, as the most significant results of this research cut across school and nation. For the insights gained through the Swedish data collection, I will always be grateful to those individuals who so kindly and candidly shared their time and expertise.

Merriam describes various types of interviews:

Interviews range from highly structured, where specific questions and the order in which they are asked are determined ahead of time, to unstructured, where one has topic areas to explore but neither the questions nor the order are predetermined. Most interviews fall somewhere in between. The semistructured interview contains a mix of more and less structured questions (Merriam, 2002, pp. 12–13).

The interview schedule followed in this study was semistructured and was designed to be completed in an hour's interview if translation was not also taking place. As pointed out elsewhere, what was recorded in the interview provided the primary data for this research. As Patton states, "Data consist of verbatim quotations with sufficient context to be interpretable" (Patton, 2002, p. 4). The chosen recording device was a small battery-powered recorder that used mini-tapes, brought to the interview in a small box with extra batteries, tapes, and labels. One problem regarding my recording device was only apparent during transcription. At that point, I discovered that I had tried to keep the batteries in use for longer than I should have for my overseas interviews, as I was reluctant to discard them too early. This meant that the tape speed was slightly variable, making some of the transcriptions more difficult.

Before starting the interview, some of the documents sent to the participants before embarking on the research trip were requested to be returned for my files and further analysis, in particular the informed consent form (Appendix D) and the background questionnaire (Appendix E). Each participant also had a copy of the interview schedule (see Appendices F through I) during the interview. The original interview schedule was translated into Lithuanian by a professional translator I had worked with in the summer of 2005, who knew the terminology of ESD. Prior to using the interview schedule in the formal interviews, the translated document was then double-checked through being reviewed in the following ways: by a bilingual educator familiar with ESD terminology; by all of the national coordinators. Some interviews were longer than others, with the Lithuanian interviews being the longest due to the need in most cases for translation. Note was made during the interview and transcription process of which questions

were actually covered during the interviews. Miles and Huberman refer to the useful device of a data accounting sheet, which “simply arrays each research question by informant or class of informants ... the analyst checks the cell when a set of data is in hand, with the ultimate objective of filling all of the cells” (Miles & Huberman, 1994, p. 80). A data accounting sheet for these participants, which helped to determine the top ten questions that were asked with greatest consistency, can be found in Appendix K.

During the interviews conducted in this study, the formal questions of the interview protocol were posed, interspersed with a few additional questions that were either open or closed in style in order to probe the participant for further information. Holstein and Gubrium focus on active interviewing, where “Participation in an interview involves meaning-making work” (Holstein & Gubrium, 2002, p. 113). They point to a process of creative interviewing which “is a set of techniques for moving past the mere words and sentences exchanged in the interview process” (Holstein & Gubrium, 2002, p. 117). Michael Patton provides detailed advice regarding interviews and means by which deeper meaning may be gained from the interview. He states that “Open-ended questions and probes yield in-depth responses about people’s experiences, perceptions, opinions, feelings, and knowledge” (Patton, 2002, p. 4). The point of probing questions is that they “are used to deepen the response to a question, increase the richness and depth of responses, and give cues to the interviewee about the level of response that is desired” (Patton, 2002, p. 372). He details a few different kinds, including detail-oriented probes, elaboration probes, clarification probes and contrast probes (Patton, 2002, pp. 372–374). In contrasting the interview schedule with probes, he says that

A major characteristic that separates probes from general interview question is that probes are seldom written out in an interview. **Probing is a skill that comes from knowing what to look for in the interview, listening carefully to what is said and what is not said, and being sensitive to the feedback needs of the person being interviewed** (emphasis in the original; Patton, 2002, p. 374).

Note here in particular that Patton's observation regarding the interviewer listening to what is not being said could be seen as the outset of a gap analysis of the responses.

Patton also touches on the researcher working across cultures. He says, "Cross-cultural inquiries add layers of complexity to the already-complex interactions of an interview. The possibility for misunderstandings are increased significantly" (Patton, 2002, p. 391). In particular, Patton touches on "the problematic short-term studies for theses or student exchange projects and brief evaluation site visits sponsored by international development agencies" (Patton, 2002, p. 392), where cross-cultural interviewing would take place. Patton quotes Rubin and Rubin (1995) in saying that "if you are going to cross social gaps and go where you are ignorant, you have to recognize and deal with cultural barriers to communication" (Patton, 2002, p. 392). Patton also makes the point in this context of the importance of taking care in dealing with language differences. "The data from interviews are words. It is tricky enough to be sure what a person means when using a common language, but words can take on a very different meaning in other cultures" (Patton, 2002, p. 392).

As has been described elsewhere, two significant issues were detected during the first interview at the first school in Lithuania, relating to problems of the sustainability language and the depth of responses to the original interview schedule. The first of these issues is addressed here, while the second issue is addressed in the subsection immediately following. The language barrier was not a problem of simple words, nor was it of conception, as each participating school had been identified and designated by a third party to be at the top standard in the nation. As the first school interview took place on a Friday and a second visit was already planned for the coming Monday, I decided that changes considered over the weekend could be implemented in time, but would then need to be used at all ensuing schools. I travelled from the site of the school by bus to the capital of Vilnius and the process I went through in the protocol redesign that weekend, which was the festival of St. Casimir, remains vivid in my mind. It was a time of

reflection as I walked the streets of Vilnius and through some snowy Lithuanian woods, making efforts to find straightforward words that captured the essence of my original research questions. This resulted in the original interview schedule (Appendices F and G) being replaced by a revised version approved by my supervisor, which made use of both simplified language and a projection technique and was used with all participants (Appendices H and I). The revised interview questions maintained the original intention or essence of my research. For instance, the issue of motivation arose in Q6 of the original schedule, yet appears in a modified form in AQ2d (Q5 of the ‘top ten’ questions) in order to unpack the complex issue to a greater extent. Although this is a question in the revised schedule that might have most benefited from more time for fine-tuning than was available to me then, it had at its heart an intention of capturing the participants’ perspective regarding their own placement on the reversible arrow between despair and sustained acceptance illustrated in the Kübler-Ross grief cycle described in Chapter 3. At the time of question revision, the words used were “understanding the seriousness of the problem”, which often leads to despair, and “hopefulness”, which often leads to sustained acceptance or equanimity.

Projection techniques

The depth problem was addressed through the use of a projection technique employing an excerpt from a book I had discovered in a bookshop on the first day of my research trip in Lithuania. The book was a compilation of short stories by Lithuanian authors, *The Earth Remains* (Srugoninis, 2002), which had been translated into English. Patton suggests that projection techniques are creative modes of qualitative inquiry, going beyond standard interviewing and that “The general principle involved is to have people react to something other than a question – an inkblot, picture, drawing, photo, abstract painting, film, story, cartoon, or whatever is relevant” (Patton, 2002, pp. 394–395). Oppenheim suggested that projection techniques can be used to break down barriers that might arise in an interview, such as the barrier

of awareness (Oppenheim, 1992, p. 211), or the barrier of politeness (Oppenheim, 1992, p. 212). In almost every interview, *The Earth Remains* projection technique gained positive response from the participants, who appeared able to break the politeness barrier to discuss the subject in a more natural manner, considering the formality of a recorded interview.

Transcription

Patton also discusses the importance of careful transcription of recorded interviews.

Transcribing offers another point of transition between data collection and analysis as part of data management and preparation. Doing all or some of your own interview transcriptions (instead of having them done by a transcriber), for example, provides an opportunity to get immersed in the data, an experience that usually generates emergent insights (Patton, 2002, p. 441).

I completed all the transcription myself, finding it an important entrance to the analytic phase. During transcription and early coding I also began writing memos, some samples of which are found in a later section. I played each section of tape a number of times in order to capture the statement accurately, which proved important. Here are a few phrases that I caught in those replays, which show either important changes or slips which were quite funny. The following example was from CA-Coord's transcript: "empower them to make a difference", on second hearing was actually, "empower them, and give them a chance to make a difference". Although it might appear at first glance to be a minor change, the accurate transcription more fully reveals the extent to which this participant believes in the skillful support of children in the care of educators, where opportunities ought to be created for students to authentically contribute. Others examples of initially mis-heard recorded segments include: "you have to get over that" was actually "you have to do yoga then"; "nap program rep" was really "snack program rep". An accurate complete set of transcriptions from the interviews was the primary data that then went through the analytic phases, detailed in later sections.

Field notes

In describing a field notebook or field log, Glesne and Peshkin suggest that it is “the primary recording tool of the qualitative researcher. It becomes filled with descriptions of people, places, events, activities, and conversations; and it becomes a place for ideas, reflections, hunches, and notes about patterns that seem to be emerging” (Glesne & Peshkin, 1992, p. 45). Michael Patton points out that “Many options exist for taking field notes.... No universal prescriptions about the mechanics of an procedures for taking field notes are possible.... **What is not optional is the taking of field notes**” (emphasis in the original; Patton, 2002, p. 302). Before leaving Toronto for my research trip I met with the late Joseph Farrell, the founder of CIDECE, with whom I had taken a number of my courses, and asked if he had any final advice from his many years in comparative education travelling to various nations and guiding his students to do the same. He shared a few stories with me, such as the time that one student went to make the pre-arranged visits to schools in an African nation, only to find the school no longer existed due to unrest in the region. “Expect change,” he laughed. He also said, “Don’t forget your field notes!”

I maintained journals before, during and after the data collection that I titled “Ideas around my thesis”, the first volume of which covers the year and a half period around the research trip and data collection, from which I have included some illustrative excerpts. The first section shows the evolution of my ideas around the thesis project in the six months before I submitted my thesis project proposal and ethical review documents in the autumn of 2005. The second section covers the research trip and data collection between March and June 2006. The third section addresses the beginning of the analytic phase.

In July 2005 I visited Lithuania and England, having experiences and meeting with people in both nations that laid the groundwork for substantial shaping of the project. This trip to Lithuania was for two weeks as I had been invited to be a keynote speaker on ESD for the

summer institute for the APPLE (American Professional Partnership for Lithuanian Education) program in Lithuania, working with teachers and teacher educators in Vilnius and Klaipeda. In October of 2005, after an initial design for the project was created, I took my prototype to the United States and discussed it with an ecological economist at the University of Burlington, Vermont, a sustainability educator in New York City, and an environmental policy specialist at Yale University. The final project design emerged after shaping the prototype after meeting with these specialists. While on my research trip changes needed to be made to my interview protocol, some of which are captured here. On my return, further thoughts of how to proceed with the data are also noted. One excerpt (November 2006) captures the gap analysis I was undertaking as guided by my readings of David Linley's thoughts on furniture and interior design, which was fundamental to being able to perceive the data in a way that would lead to the model of sustainability perspectives.

Here are a few samples from my field notes. Note that entries made on different days of a given month are separated by a new paragraph and dash.

Design phase before research trip:

May 2005: *Thinking of doing a cf. [comparative] study: T.O. with LSF Youth Forums [or] 5 boroughs of NY with IF [Inventing the Future by the Cloud Institute for Sustainability Education] curriculum (about 3 schools each)*

July 2005: *visit to Lithuania – AMAZING.... Really only after left country did I think I'd use them for a case study nation.... Research still wanted to focus on KIDS – looking at their projects after ESD: “to what extent does sustainability curriculum support students to change their behaviours and reduce envtl. impact?” [Shared with British environmental educator, who] said that's the \$10 million Q; must refine it!*

August 2005: *Met with [Canadian ecological economist]: do review of ESD – decide on 10 or so characteristics and interview/survey teachers → cf. [compare] “EcoSchools” with “Traditional” public sector secondary teachers....*

September 2005: [initial questions for interview schedule] % *curric wrt* [relating to] *S.D.* → *what part of curric. dropped; role of teacher: leader vs. facilitator of learning ... best activities/practices; image of future progress? biggest success stories? How do you know when you've succeeded?*

- *Decided to drop Eco vs. Non-EcoSch. so will have 9 [3 in each of 3 nations] instead of 18 interviews.... Focus on teachers as experts, with background questionnaire and 1h interview.*

October 2005: [meeting with Canadian environmental educator who] *suggested I interview the principal and chief caretaker ... in the 3 countries*

Research trip and data collection:

February 2006: [meeting in Oxford with environmental specialist who said] *point about Sust. Dev. is that it has expanded to include SO MUCH it is virtually meaningless.... I agree with him – need to focus on what is the difference between GOOD PRACTICE (eg. good teamwork, good management) – and S.D. – I admitted being guilty of conflating these.... WHAT is the difference?*

March 2006: *Visited School #1 [in Lithuania, LT-1]; Found it SHOCKING that they [had issues with defining ESD] – we really are talking diff. languages! ODD. And not sure if it's a personal thing or a cultural thing.... What does useable data look like??*

-*Visit to School 2 [in Lithuania, LT-2] – Celebration of International Women's day! I received a red TULIP ... Lovely. [The director] was really v. eloquent in the school museum ... he said they are a nation that has been On Their Knees. Repeatedly.... Seeing those pictures and knowing in SO MANY ways Lithuania was really in a RELATIVELY stronger situation 60+ years ago!! What would their econ, soc. envt be like NOW if they hadn't had those long years? ... But does it follow that they are NOT as happy as everyone else? ... Saw curricula [in Lithuanian] today – would love copy of it. In this historical context – these S.D. efforts really are Remarkable.*

- [in Sweden] *Just as my “proxy indicator” for the speed of my life is the number of onions that go through my kitchen within a given period of time [more onions = more cooking = less time pressure from work] – What are the proxy indicators of a happy, sustainable society?*

- *Just finished visit School #2 of my visit to Sweden.... Can't believe now really officially I've visited all the schools.... As [teacher at SV-2] mentioned – a S.D. school is like seeing a bar/restaurant/hotel/shop you like – you piece together a thousand little things in an instant – and any number may change but the sum points to S.D./good practice.*

April 2006: [in New York City, writing first impressions overall of research trip, covering pages of notes] *Other Q: – issues of scale ... issues of power ... issues of holistic approach ... issues of content ... issues of intensity of experience ... issues of authentic learning: whose learning? who's learning? to make WISE CHOICES ... issues of motivation ... issues of complex networks ... proxy indicators ... issues of value (-added) eg. superficial greening vs. deep commitment. issues of renewal ... issues of local/fundamental importance ... issues of scale ... issues of happiness ... issues of effort ... issues of depth and breadth ... issues of influence ... issues of indicators ... issues of spheres ... issues of time ... issues of MINDFULNESS ... issues of agenda ... issues of goals....*

- [on flight back to Toronto] *Now in air – see T.O. See the CN tower – hazy. Bright.... So – the end has come to my SPRING 2006 RESEARCH TRIP. What has it been like? A major challenge – but So Diverse, and I think important, useful.... remember the MANY images and feelings of this trip.*

May 2006: [after visits to Canadian schools] *Just spoke with [CA-Coord] and she said that the problems I have discovered ... THOSE ARE MY FINDINGS – I can't ignore them.... They are meaningful and revealing! Do NOT “wait” until I have a Perfect team, a Perfect school – and for 2 days of visit – go with what I have!*

Analytic phase after research trip :

August 2006: [when considering the statements of participants in transcripts] *Think of Johnny Carson and his skit of the Great Carnac ... give a statement and then ask the Q. that statement is the answer to.... These adults in the EcoSch. program are the causal agents/catalysts that enable citizens intly [internationally] to lead happy lives in balance with the limits of the earth.*

- that there is no FORMULA – that the best approach seems to be a “tailor-made” Bespoke approach – one of INVESTIGATION, not FORMULAS

- John Singer Sargent, 1885. “Carnation Lily, Lily Rose”. [curatorial comment states he was] going through cycles of “observation, reflection, and refinement for his vision”. [seen at the Museum of Fine Arts, Boston, when I visited the “Americans in Paris 1860–1900” exhibit]

- Sometimes, it’s the things you don’t see that matter most ... the small picture is often the big picture.

November 2006: [after meeting with my supervisor, 9 November] *What DIFFERENCES – as well as similarities exist? As Linley would say ... “the omissions are as interesting as the inclusions”.... re-order the strips [précis documents] – not by nation or role, but by Question or theme – and then NOTE who said what range of responses – any patterns? And note then the nation/sch or role ... and consider ... So What? ... Now What?*

- KEY DAY! [Sat. 11 November] lay out by school and Nation and made a summary on one page of the 6 Swedish Q – and placed participants into [thin versus thick description] response category – and saw a movement of each person – what was the pattern? Then made summary table of this “graph” into 3 categories [connection, interpretation, engagement] with [response style category] for each person – I summarized what # of each and then began to see a pattern of progression

Of interest in the August 2006 notes is the entry regarding the work of Sargent hanging at the Museum of Fine Arts in Boston. The lives of John Singer Sargent (1856–1925) and Edith Cobb (1895–1977) overlapped to such an extent that Sargent’s work would undoubtedly have

influenced that of Cobb, particularly given her affinities with the artistic world. The image of *Carnation, Lily, Lily, Rose* depicts two young girls lighting lanterns in the gloaming of a summer's day, surrounded by the abundant blossoms of a garden. It perfectly captures the world of childhood embedded and influenced by nature almost exactly as Cobb visualized and expressed it through her writing. Equally interesting, the curatorial comments regarding Sargent's painting process could well be applied to the work of Cobb.

The November 2006 entry touches on David Linley's writing in *Design and Detail in the Home*. Some of his comments helped shape my thinking regarding my data.

When I think of my favourite living rooms, it is invariably the happy times spent in them that I remember rather than the objects they contain, and this must be a testimony, in part at least, to the mood created by the room (Linley, 2000, p. 48).

As the grandson of the late Queen Mother, David Linley would have been exposed to rooms that most other individuals would never see in person, filled with crafted objects that might capture his attention as a furniture maker. This excerpt appeared to reveal his sensitivity to the overriding importance of the purpose served by any room and the static entities they contain: to support those dynamic aspects, the processes that happen when living beings enter the space. He explores this point further when describing the interest provided by an entirely pared-down space. "Even more austere in its absence of colour and ornament is [another] drawing room.... Rather like an empty stage, this is a room in which people rather than furniture must provide the colour and ambience" (Linley, 2000, p. 56). These comments helped me through a significant transition, which was to reorient my attention from the constituent parts of the data towards the dynamic processes with which they might be associated, part of which is captured in the field notes of this time.

Analyzing Data

This section details strategies and techniques used to develop the phases of analysis that developed in response to the patterns emerging from the data.

General analytic strategies

In the introduction to the first edition of their *Handbook of Qualitative Research*, Denzin and Lincoln put forward the usefulness of the qualitative researcher as a *bricoleur*, producing what is termed bricolage. They cite Weinstein and Weinstein's work (1991, p. 161) for the definition of bricolage:

a pieced-together, close-knit set of practices that provide solutions to a problem in a concrete situation. "The solution (bricolage) which is the result of the *bricoleur's* method is an [emergent] construction" that changes and takes new forms as different tools, methods, and techniques are added to the puzzle (Denzin & Lincoln, 1994, p. 2).

Miles and Huberman do not use the term bricolage, but the advice section in their concluding remarks points to the vigour of hybrid methods.

Entertain mixed models. We have sought to make a virtue of avoiding polarization, polemics, and life at the extremes. Quantitative and qualitative inquiry can support and inform each other. Narratives and variable-driven analyses need to interpenetrate and inform each other. Realists, idealists, and critical theorists can do better by incorporating other ideas than by remaining pure. Think of it as hybrid vigor (emphasis in the original; Miles & Huberman, 1994, p. 310).

This thesis makes use of the possibilities of the interpenetration of narrative and variable-driven analyses. In their introduction to *Strategies of Qualitative Inquiry*, Denzin and Lincoln continue their description: "[If the] qualitative researcher as *bricoleur*, or maker of quilts ... needs to invent, or piece together, new tools or techniques, he or she will do so. Choices regarding which interpretive practices to employ are not necessarily made in advance" (Denzin & Lincoln, 2008, p. 5). The notion of bricolage aligns well with the manner that I worked with the data, the variety of techniques used, and the resulting tapestry. Heila Lotz-Sisitka makes central use of both the storytelling and weaving analogies in environmental education in her article, "Weaving

Cloths: Research Design in Contexts of Transformation”. Interestingly, she also touches on the concept of gap analysis, or being sensitive to absences, which has also been an important aspect of my work. She states that “we may continue to weave cloths that are bright, textured, and varied, cloths that will express and explore our patterns of noise, and our patterns of silence” (Lotz-Sisitka, 2002, p. 106).

There were a number of techniques made use of in the analytic phase of this research. It is Glesne and Peshkin who suggest that “Data analysis ... is the prelude to sensitive, comprehensive outcomes that make connections, identify patterns, and contribute to greater understanding” (Glesne & Peshkin, 1992, p. 146). Miles and Huberman outline that data analysis consists of three aspects, “data reduction, data display and conclusion drawing/verification” (Miles & Huberman, 1994, p. 10). Some aspects of data analysis in this thesis are outlined in greater detail in later sections of this chapter, such as coding, style of response, and memoing; others are discussed briefly here in the context of general analytic strategies. As can be seen in the appendices, matrix analysis was used as a primary method scaffold. Matrices are a form of data display, which are “a visual format that presents information systematically” (Miles & Huberman, 1994, p. 91). As described below, other forms of data display in this thesis would include the précis documents from Phase 2 analysis or the word maps from Phase 4 analysis found in Chapter 7. Descriptions of these forms of display are given later in this chapter. As with so many of the options for data display, both of these styles were used in order to “Get a sense of the data; check out the quality of the information you have collected. **Get a sense of the whole**” (emphasis in the original; Patton, 2002, p. 440). Miles and Huberman define matrices to “essentially involve the crossing of two or more main dimensions or variables (often with subvariables) to see how they interact” (Miles & Huberman, 1994, p. 239). Appendices N and S illustrate two different styles of matrix used in this thesis. “There are no fixed canons for constructing a matrix. Rather, matrix construction is a creative – yet

systematic – task that furthers your understanding of the substance and meaning of your database” (Miles & Huberman, 1994, p. 240). A description that applies to almost all the matrices constructed for this research is that they are simple, being two-way matrices: “organized in two dimensions” (Miles & Huberman, 1994, p. 241). Matrices organize data in a way that supports the drawing of conclusions. “The most frequent, basic tactics we have seen used for drawing first conclusions are noting patterns, themes; making contrasts, comparisons; clustering; and counting” (Miles & Huberman, 1994, p. 243). Some researchers do not venture into the realm of matrix use, perhaps due to the sense that matrices can lead from words to numbers, with uneasiness arising from the spectre of the longstanding debate between proponents of qualitative and quantitative methods. Miles and Huberman clarify their position on matrices by stating that

In qualitative research, numbers tend to get ignored. After all, the hallmark of qualitative research is that it goes beyond *how much* there is of something to tell us about its essential *qualities*. However, a lot of counting goes on in the background when judgments of qualities are being made.... It’s important in qualitative research to know (a) that we are sometimes counting and (b) when it is a good idea to work self-consciously with frequencies, and when it’s not (emphasis in the original; Miles & Huberman, 1994, p. 253).

This thesis makes judicious use of counting, particularly of word (subtheme) frequencies for each participant.

Bernard and Ryan state that “Although it’s not a perfect relationship, words and phrases that appear more often in a text tend to be more salient to the writer or speaker who produced the text” (Bernard & Ryan, 2010, pp. 193–195). They also state that “At the heart of word count analysis is the conversion of text into respondent-by-word matrices” (Bernard & Ryan, 2010, p. 196). They describe how the words themselves are the variables: “The units of analysis are respondents and the variables are the words they used in their texts” (Bernard & Ryan, 2010, p. 199). In tracking the subthemes touched on by each participant, complete word-by-respondent matrices were created in a number of different ways, such as: by question (Appendix S), by

question strand (Appendix T), in vertical analysis by question (Appendix V), and in horizontal analysis by stage (Appendix W).

Key-word-in-context (KWIK) and word maps

Another technique used in this research is termed by Bernard and Ryan as key-word-in-context (KWIK). They contextualize KWIK by quoting Firth's 1957 statement, "You shall know a word by the company it keeps" (Bernard & Ryan, 2010, p. 192). This method was used, particularly in describing the views in Chapter 8, where certain subthemes were noted as always appearing in the presence of one or more other subthemes.

A form of the KWIK technique was used in looking at the key subthemes that arose in relation to responses of participants at different stages of the model of sustainability perspectives. I developed a data display that I refer to as "word maps", which are a central method used to illustrate the Chapter 7 analysis. The visual complexity of the word maps can be taken as a proxy for the stage of the participant, as discussed in greater detail in that chapter. The initial idea for the word maps sprang from a discussion on proportion, which can be described through fractions, percentages, or decimals. Individuals might understand each of these entities separately, but those who understand all three to be essentially one and the same would actually have a good grasp of the overall concept of proportion. I imagined this could be represented by overlapping ellipsoids such as those found in concept mapping or the type of diagram proposed by John Venn (1880) and applied it to my own research in the form of word maps. Miles and Huberman encourage researchers to be creative, particularly around data display. "Be open to invention: The wide range of useful displays we and many others have created reinforces our belief that the universe of useful displays is very large and, like other universes, constantly expanding" (Miles & Huberman, 1994, p. 310).

Coding

Coding is “a procedure that disaggregates the data, breaks it down into manageable segments, and identifies or names those segments” (Schwandt, 2001, p. 26). He identifies three ways of coding, of which coding in this study would be classified as “A grounded, a posteriori, inductive, context-sensitive scheme” (Schwandt, 2001, p. 26). Another way of describing coding follows:

Codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study. Codes usually are attached to “chunks” of varying size – words, phrases, sentences, or whole paragraphs, connected or unconnected to a specific setting. They can take the form of a straightforward category label or a more complex one (Miles & Huberman, 1994, p. 56).

The umbrella codes used in Phase 1 analysis in this research tracked larger themes flowing from the interview protocol, with subcategories of codes arising from the participants’ responses. For instance, it was apparent that individuals with similar job roles, such as administrators, might respond to questions in a similar way. From the interview question (see Appendix L, Q8) asking for a description of challenges experienced in the program and how they dealt with them, responses were elicited that provided insight into their style of leadership and communication; relevant transcript segments were coded as such. However, by Phase 3 analysis codes were detailed and specific and termed “subthemes” in this thesis.

Morphing of codes through the analytic phase is detailed by Miles and Huberman: “The initial coding scheme is usually influenced by the research questions, but it develops and iterates steadily as further coding is carried out” (Miles & Huberman, 1994, p. 307). Patton links coding to other important aspects of the analytic phase, where the link between coding and interpretation is made explicit:

Classifying and coding qualitative data produce a framework for organizing and describing what has been collected during fieldwork.... This descriptive phase of analysis builds a foundation for the interpretive phase when meanings are extracted from the data, comparisons are made, creative frameworks for

interpretations are constructed, conclusions are drawn, significance is determined, and, in some cases, theory is generated (Patton, 2002, p. 465).

Coding, therefore, is an essential point of transition from the raw data of the participants to the meaning construed by the researcher.

The process of coding can be fraught with problems both for the individual researcher and teams of researchers. Schwandt touches on a few common problems, describing issues that were both sensed and addressed in this research.

Perhaps the three most troublesome tendencies to be aware of in coding are (a) the tendency to code largely at the descriptive level rather than to code for purposes of explaining or developing an understanding of “what’s going on here”; (b) the tendency to think of coding as a mechanical, straightforward, algorithmic process, thereby ignoring the prior conceptualization and theoretical understandings that are involved; and (c) the tendency to regard codes or categories as “fixed” or unchanging labels, thereby ignoring their organic, dynamic character (Schwandt, 2001, p. 27).

An illustration of the operationalization of coding is provided by Miles and Huberman, who also warn of the problem of being bored while coding. They provide an explicit illustration for help through an excerpt of text that has been coded on the left margin, with more reflective remarks made in the right margin.

As coding proceeds, if you are being alert about what you are doing, ideas and reactions to the meaning of what you are seeing will well up steadily.... If your codes appear in the left margin, it is useful to put preanalytic remarks of all sorts in the right margin.... They also point to important issues that a given code may be missing or blurring, suggesting revisions in the coding scheme (Miles & Huberman, 1994, p. 67).

The transcript documents for this thesis were typed in a two-column table, with the participants’ statements in the left column, leaving the right column free so that the initial codes could be entered. Both margins were then available for additional hand-written notes.

Style of response

The concept of thick description was first noted by Oxford philosopher Gilbert Ryle (1968/1971), and later developed by Princeton anthropologist Clifford Geertz (1973/1975) in the

context of ethnography. Ryle outlines in his essay, originally a university lecture, “The thinking of thoughts: What is ‘Le Penseur’ doing?” his idea that a single action, such as a schoolboy winking in class, can be given a multilayered description, with each layer contingent on its predecessor. Starting with the thinnest possible description, which in Ryle’s winking example would be a twitching eyelid, it moves through layers such as signaling, parody, and rehearsal. As Ryle puts it, “There is only one thing that he is trying to do, namely to take off [parody] the winker.... Yet there is now a threefold internal complexity to his own report ... ‘I was trying (1) to look like Tommy trying (2) to signal to his accomplice by trying (3) to contract his right eyelids’” (Ryle, 1968/1971, p. 482). Geertz explored the role and value of thick description in terms of sorting and clarifying levels of meaning. In Geertz’s essay, “Thick Description: Toward an Interpretive Theory of Culture”, he says “The determining question for any given example ... is whether it sorts winks from twitches and real winks from mimicked ones” (Geertz, 1973/1975, p. 16). Further, “A piece of ... interpretation consists in tracing the curve of a social discourse; fixing it into an inspectable form” (Geertz, 1973/1975, p. 19). This aspect of thick description, in Geertz’s view, is the essence of ethnology; similarly it captures the basic quality of qualitative analysis. As Geertz also points out, with particular relevance to the interpretation of participants’ responses, “What we call our data are really our own constructions of other people’s constructions of what they ... are up to” (Geertz, 1973/1975, p. 9). A keystone of the analysis of participants’ responses for this study is sorting them into thin and thick descriptions (see Appendix N for an outline of response styles by question and Appendix O for response style by participant). This criterion is taken to be a proxy indicator of the depth of a participant’s actual experience and practice, and as Geertz might suggest, no more direct indicator is available from an ethnographic perspective.

Memoing

The definition that Miles and Huberman (1994) cite as the classic one is Glaser's (1978, pp. 83–84). A memo is the “theorizing write-up of ideas about codes and their relationships as they strike the analyst while coding.... it can be a sentence, a paragraph or a few pages” (Miles & Huberman, 1994, p. 72). Miles and Huberman go on to state that “Memos are primarily conceptual in intent. They don't just report data; they tie together different pieces of data into a recognizable cluster, often to show that those data are instances of a general concept” (Miles & Huberman, 1994, p. 72). Bernard and Ryan suggest that “Memos are field notes about codes and contain our running commentary as we read through texts” (Bernard & Ryan, 2010, p. 76). Glesne and Peshkin suggest that writing memos is useful, particularly in early data analysis. “Consistently reflect on your data, work to organize them, and try to discover what they have to tell you. Writing memos ... developing analytic files, applying rudimentary coding schemes ... [helps you] to learn from and manage the information you are receiving” (Glesne & Peshkin, 1992, pp. 127–128). I found writing memos and developing analytic files to be particularly useful means of working with the data in the initial analytic phases.

The following excerpts are memos written after transcription and during the first phase of coding, when similarities and differences among responses to different questions were becoming apparent. Around this time I had been intrigued by an idea expressed by the American chef Julia Child in the foreword to her seminal book *Mastering the Art of French Cooking*. She wrote of the patterns that she detected among the many recipes, connecting dishes involving disparate ingredients such as lobster, chicken or beef through the similarity of technique or process used in cooking. She says:

As you enlarge your repertoire, you will find that the seemingly endless babble of recipes begins to fall rather neatly into groups of theme and variations; that *homard à l'américaine* has many technical aspects in common with *coq au vin*, that *coq au vin* in turn is almost identical in technique to *boeuf bourguignon*; all

of them are types of fricassees, so follow the fricassee pattern (Child, Bertholle & Beck, 1961/2008, pp. xxiii-xxiv).

I found myself wondering about the ways in which the participants were similar and different to each other, just as these dishes involving such different ingredients were still drawn together in the classification of fricassees. I began to consider the ways in which participants might vary as widely as these ingredients and yet be classified according to something more fundamental, such as a process which they all shared or reflected.

The following memos illustrate early thoughts regarding the transcripts of the national coordinators' interviews and the beginnings of tracking the similarities among different participants by a means of focusing on the process described in their response rather than foregrounding the content of their responses. Different points in the transcript are indicated through a new paragraph and dash.

Canadian coordinator [CA-Coord] transcript:

- *entered discussion with [CA-Coord's] comments on lingo barriers [and definitional issues] – interesting to hear, “those fine definitions don't matter”*

- *my point of what I need for inspiration, for motivation – is the children:*
[KMG:] *“I really think it would be very difficult for me if I lost the view of the children, and no longer had their voices in my head.” And [CA-Coord's] pt: “if you don't continue to have those kids in view, then it doesn't matter. That's got to be basic.”*

Lithuanian coordinator [LT-Coord] transcript:

- *[LT-Coord] points of going beyond just simple envt [environmental] topics to give them the skills to influence these issues – ECHO [CA-Coord]!!*

- *funny exchange – figuring out limits on recycling etc – and I said “your parents are excused as there is no blue box program” – and [LT-Coord] said, “No, not excused”!!!*

- [LT-Coord] *echoes* [CA-Coord] “Another part, the soft part ... what the school is doing and how they are doing it. Actually, the most important is not what we do, but how we do it.” because [CA-Coord] was big on process too!!!

Swedish coordinator [SV-Coord] transcript:

[SV-Coord's] *example of good practice to change bus schedule – reflect back on* [an American sustainability educator's] *kids' [students in Manhattan] wanting to get rid of crack house – so SD often influences sphere outside of school!!! Best case scenario – then relate back to* [American sustainability educator's] *point of going as far upstream in your questions as poss., and to match the question to the sphere of influence!*

These excerpts from my memos illustrate the work in progress of early analysis, while supporting the contention that memos “are one of the most useful and powerful sense-making tools at hand” (Miles & Huberman, 1994, p. 72).

Interpretation as method: beyond constituents to process

Regarding the nature of qualitative research, Robert Stake distinguishes between two approaches, comparing those researchers (such as Guba and Lincoln, 1982, and Eisner and Peshkin, 1990) who “place high priority on direct interpretation of event, lower priority on the interpretation of measurement data” (Stake, 1995, p. 40), with other researchers who maintain priorities illustrating the opposite emphasis. In support of the second perspective, Stake cites Frederick Erickson's 1986 claim “that the primary characteristic of qualitative research is the centrality of interpretation” (Stake, 1995, p. 42). In the present study, the interview protocol responses of participants are provided, but the approach taken here tends to move beyond the constituent entities of the responses to the process represented within the data and available through interpretation. To a great extent, then, the research presented in this thesis places a high priority on the interpretation of data, engaging in what Stake refers to as “interpretation as method” (Stake, 1995, p. 42).

In the sections above regarding field notes and memoing I have touched on the influence of writing by David Linley and Julia Child on the analytic phase of my work. During this period I was also reading *Bearing Witness*, Roshi Bernie Glassman's writing on the importance of being awake to the most intense suffering on the planet as a means of fostering peace. He illustrates the concept through descriptions of ground-breaking meditation retreats he organized, which took place in the heart of sites of great suffering, such as at Auschwitz-Birkenau, or living with no money on the streets of New York City (a "street retreat"), or the midst of a prison, or in the Letten, one of the most notorious drug Parks in Zurich. The purpose of the street retreats was not simply to bear witness and experience the suffering of urban poverty, but to discover that the essentials to life are available even in these difficult conditions. In the chapter entitled "Aimless Meandering", Glassman describes one street retreat for which a man showed up with a backpack filled with essentials as well as a good sleeping bag. Not only was this against the instructions for the retreat, which were to show up only in the clothes on your back with absolutely no money at all; it would also prove to be a hindrance to his own learning.

Naturally, this limited his ability to meander aimlessly. At night he was warm and comfortable, but he defeated the purpose of going on the streets, which is to *examine the ingredients at hand and make a meal out of them*. He brought his own ingredients from home. If instead he'd gone out fearlessly, he'd have discovered that the streets had everything he needed (emphasis added; Glassman, 1998, pp. 126–127).

Perhaps it was his use of the word "ingredients" that brought to mind the nature of a French chef working with the seasonal materials to hand in local markets, rather than the predictable inventory of most grocery stores, but I could see relevance to the field of sustainability learning in working in a more fluid, off-recipe manner, what I came to term as a "sustainability chef". In reading this passage I also saw a similarity with Linley and Child in that all three authors were discussing the importance of being aware of or engaging with the process behind constituents, what Sir Ken Robinson describes as a "conversation between what we're trying to figure out and

the media we are using” (Robinson, 2009, p. 75). Particularly for Glassman and Linley the process sprang to the fore when the constituents were sufficiently backgrounded or even removed. Discussion of the importance of gap analyses and the eloquence of zeroes exists elsewhere. In an exploration of “orphans”, topics from the gaps of the discourse of environmental education, Lucie Sauvé and her colleagues (Sauvé, Berryman & Brunelle, 2007, p. 36) cite Gregory Bateson’s (1979, p. 51) observation from *Mind and Nature* that “zero, the complete absence of any indicative element, can be a message”. In some ways, listening for gaps not only gives insight into driving processes, but it can be a means of probing the submerged portion of the metaphoric iceberg regarding details in a given field. This passage by Glassman therefore provided me with two things: a revised title for this thesis around the notion of sustainability chefs, and further insight into the importance of process over constituents.

Phases of Analysis in this Research

The above sections outline techniques used in both collection and analysis of the data, while this section is provided to illustrate how these techniques came together in a more linear temporal dimension. There will be some overlap in description, but depicting Phases 1 to 4 in this way may prove useful to the reader, especially as they were completed sequentially. Miles and Huberman describe the course analytic progression may take, depicting it in a diagram that represents an upward staircase. They cite Carney’s (1990) ladder of analytic abstraction and Gherardi and Turner’s *Real Men Don’t Collect Soft Data* (1987) as they describe analytic progression:

You begin with a text, trying out coding categories on it, then moving to identify themes and trends, and then to testing hunches and findings, aiming first to delineate the “deep structure” and then to integrate the data into an explanatory framework. In this sense we can speak of “data transformation” as information [that] is condensed, clustered, sorted, and linked over time (Miles & Huberman, 1994, pp. 91–92).

Significantly, they indicate that “the qualitative analyst has to handcraft appropriate data displays ... adapting those of others or inventing new ones” (Miles & Huberman, 1994, pp. 92–93). As will be indicated, in progressing through the four phases of analysis in this research, their description matches my own experience of making use of the techniques of others while creating some new ones for the task at hand. Another resonant point is that the process cycles and includes the following aspects: “building the format, entering the data, drawing conclusions, writing analytic text, and cycling onward to revised or new displays” (Miles & Huberman, 1994, p. 93). The methodology of each analytic phase in this research built on the results from the previous phase.

Overall, Phase 1, which involves working with the transcriptions and coding, follows a mainstream qualitative research of the type described by Glesne and Peshkin (1992). Phase 2 uses gap analysis along with data display of the type described by Miles and Huberman (1994) to move the data forward through the use of the précis documents. Patton would distinguish between Phase 3’s illuminative approach and Phase 4’s deeper, explicative analysis (Patton, 2002, pp. 486–487). These descriptions are detailed to a greater extent in Chapter 5. Together, the phases of analysis undertaken in this research form a bricolage or tapestry in responding to my research interests regarding sustainability in secondary schools.

Phase 1

The first phase of analysis began as I stepped onto the site for my first interview, knowing that all my various senses were being used for cues that might relate to the research that brought me to that place. Miles and Huberman make reference to the presence of nonverbal data as they point out a problem with transcriptions of interviews: “transcriptions often erase the context along with some crucial nonverbal data” (Miles & Huberman, 1994, p. 56). Although data collection techniques were separated from data analysis in the sections above, in fact they interweave as a researcher works. As Glesne and Peshkin point out, “Data gathering includes

parts of analysis, analysis leads to more data...” (Glesne & Peshkin, 1992, p. 148). This was certainly my own experience, in that from the outset I made efforts to tune the ways in which I was listening in order to pick up early versions of codes. Some of these thoughts regarding the data I was collecting were documented in my field notes. To touch on Bernard and Ryan’s point that “Memos are field notes about codes...” (Bernard & Ryan, 2010, p. 76), some of those field notes might be seen to be early memos. Aligned with mainstream qualitative analysis regarding both techniques and tenor of results, if Phase 1 began with my first interview, it continued through the remaining interviews, the transcription process, and later stages of memoing. The results of the analytical phases are outlined in some detail in the following four chapters, but briefly, one of the results of Phase 1 was revealing detectable patterns in the data, for instance in responses of individuals in the same kind of role, regardless of school or nation. The questionnaires also showed that there were many similarities in the background of the participants by role as well.

Phase 2

The second analytic phase began with the realization of the balance of success and limitations of Phase 1. Although the first phase led to insights into the data, the results were on the order of what Miles and Huberman describe in Level 1 of the ladder of analytic progression: “Summarizing and packaging the data; Trying out coding categories to find a set that fits” (Miles & Huberman, 1994, p. 92). The intention of Phase 2 was to sufficiently condense the data from the extended text of the collection of hundreds of pages of transcript so that I could see the entire response for a given participant at one glance. To this end, I created the précis documents so that they might “show reduced, focused, organized information on a single page rather than in extended text” (Miles & Huberman, 1994, p. 93). The term “précis document” refers to a two-metre length of ticker tape created for each participant to which I attached colour-coded squares containing their responses to the 18 questions of the alternate interview schedule; in practice,

these became 19 questions, with the division of one question (AQ3c) into two parts (AQ3c Part A and AQ3c Part B). Figure 6 shows, along with a photograph of the précis documents for Canada and Sweden, a sample square to give an indication of size, with various colours for the job role (for instance, here green for a teacher), the code of the participant indicated (SV-Teach1), the school (SV-1), the nation (indicated by the flag), and the question number of the alternate schedule (AQ1). The process of condensing the participants' responses to fit into the squares was useful both as a technique and in supporting me to see the data in a sharper light. Memoing continued through this phase, with code clarification also continuing.

Figure 6. Précis documents: (l) some participant strips; (r) one sample square.

An excellent feature of the précis documents was that they were highly manoeuvrable, allowing me to group and re-group participants by role, school, nation, and ultimately by style of response in different areas around my living room floor. The précis documents showed visually the information I had collected in Appendix K regarding responses given explicitly, implicitly, and not given. As the questions were attached to the ticker tape in the same order for each individual, I could see the resulting gaps at a glance. For instance, lining up the Canadian

participants as a cohort showed a blank square under AQ2a, with only CA-Coord responding to AQ1. Comparing the gaps of data from the interview questions among all 30 participants led to the focus on those ten questions that had the most consistent data across all participants. Of note here is that the précis documents allowed in Phase 2 general observations such as the fact that all Lithuanian teachers had thick responses to (Original) Q2. The full import of this is explored through the later analytic phases and discussed in Chapters 6 through 8, but at the outset it was clear that these teachers all shared aspects of a similar path in coming to ESD. The other aspect of what began with the précis documents and was explored later was that only the basic designations of ‘thin’ and ‘thick’ were made at this time. Later, the full import of the various subthemes made use of within a response and the full catalytic effect of the use of combination of subthemes would be clarified, as seen in Chapters 6 through 8.

In moving from the alternative questions to the top ten questions, AQ3c was subdivided into Part A (successes) and Part B (challenges), while AQ4c and AQ4d, which were listed separately on the schedule, were combined on one response square (AQ4cd). In this way, the 18 questions on the alternative interview schedule shifted to the top ten questions by dropping eight question responses (AQ1, AQ2a, AQ2c, AQ3i, AQ3b, AQ3d, AQ4b, AQ5) from the final analytic phases. While this does represent some loss of data, the main reason for dropping these questions was due to the lack of response to them, so the data to be found from these questions are reduced, by definition. Also, responses from some of these questions were included in the initial analytic phases, so this does not represent a complete loss of data. These ten questions could be seen to fall into three strands of interpretation, connection and engagement; see Appendix L for the ‘top’ ten questions and three strands. By this point I had noticed that there was a global difference in participant responses, so that each question response for each individual was noted as being thin description, thick description, or no response (see Appendix N). The intention of working with the data in such a close manner is described in the second

level in Miles and Huberman's ladder of analytical abstraction: "Searching for relationships in the data ... finding out where the emphases and gaps in the data are" (Miles & Huberman, 1994, p. 92). It was around this time that the focus began to shift from constituents to process, with this being reflected in the methods chosen.

Phase 3

The third phase of data analysis began with the results of the raw response style data shown in Appendix N from Phase 2 and moved them forward through the realization that there was a pattern embedded in these results. The pattern showed an overall progression from thin description across the questions in all three strands to thick description across all three strands of question, with the shifts being made in a predictable, repeating manner. Thick description responses first appeared as a majority in the connection strand of questions, then in the interpretation strand, and lastly in the engagement strand of questions, moving through an increase in thick responses observable through six stages. Each person could be described by their unique pattern of responses by question (ten-part variation due to ten questions), but when considered by strand (three-part variation due to the three strands), some participants resembled other participants in a way that did not necessarily link to their role, school, or nation. Appendix O details the raw data indicating style of response for each participant. Triangulation of data occurred in this analytic phase as the progression shifts happened in the same manner regardless of the nation or school from which the data were sourced. I refer to this pattern of progression in the data as the model of sustainability perspectives, which has six stages and which forms both a key outcome of the study and a new lens for exploring the data in greater depth. Phase 3 includes both the description of the model and its use as an organizing technique in considering the data of the participants' responses, and could be described by Level 3 of Miles and Huberman's ladder of analytic progression: "Developing and testing propositions to construct an explanatory framework ... cross-checking tentative findings; Matrix analysis of major themes in

data” (Miles & Huberman, 1994, p. 92). The model is described in greater detail in Chapter 5 and it is used in considering the data both vertically by question in Chapter 6 and horizontally by stage in Chapter 7.

Phase 4

Central to the fourth analytic phase is the final, most fine-grained stage of coding which involved tracking 28 subthemes in participants’ responses. This phase involved word counts of the subthemes for each individual for every question, tabulated in spreadsheets. As the number of subthemes associated with each question varied, what constituted a thin or thick description also varied. Appendix R indicates the number of subthemes involved in each style of response. Note that a thin response involves either one or two subthemes, whereas the starting point for a thick description is either two or three subthemes, building on the foundation level of the thin description. Thick descriptions then range up to using between four and nine subthemes, depending on the question. The table in Appendix R is in close alignment with the description of the difference between a thin and thick description originally made by Gilbert Ryle, as single- versus multilayered, with the multiple layers incorporating the more fundamental layer. This concept appears in Ryle’s example, where the person engaging in parody or rehearsal will always be engaging in the simple act of winking at the same time.

As discussed in later chapters, subtheme and style of response tracking was completed using data display of word-by-participant and other two-way matrices (see for instance Appendices S through X). Throughout, subtheme tracking was a binary process (0 or 1), so that if an individual mentioned a subtheme in any given question response more than once, the number noted in the matrix would still be one (see Appendix V, for example). Phase 4 analysis builds on the style of response determined in the Phase 2 analysis while extending the description of findings given that thick description aligns closely with the number of different subthemes (not their frequency of use). The focus on subtheme through the matrix analysis of

Phase 4 provides substance to the discussion of the data by question in Chapter 6 and the participant ‘portraits’ provided in Chapter 7. Other techniques that arose in this analytic phase were the word maps accompanying the Chapter 7 stage portraits, key-word-in-context (KWIK), which led to the determination of the four views and analysis of Chapter 8, and regression analysis modelling the increase of the number of subthemes used by individuals with increase in stage. Miles and Huberman’s description of the top of the ladder of analytic progression includes “Delineating the deep structure. Synthesis: integrating the data into one explanatory framework” (Miles & Huberman, 1994, p. 92). Although other techniques might be used on the data collected, Phase 4 is the final stage of analytic progression for this doctoral thesis.

Methods Considerations

Overall considerations regarding methodology include both quality issues of the research and its limitations. Merriam asks the question, “what constitutes a ‘good’ or ‘quality’ qualitative study, one that can be trusted should we want to make use of the knowledge generated by the study?” (Merriam, 2002, p. 18). The purpose of this section is to explore this question.

Research Quality and Ethics

In qualitative research dialogue, issues of quality and ethics figure prominently. Merriam points out that

both producers and consumers of research want to be assured that the findings of an investigation are to be believed and trusted. In qualitative research as in other kinds of research, there are ways to ensure for rigor in the conduct of the study (Merriam, 2002, p. 22).

For a summary of items guiding quality issues, she provides a table that touches on the various aspects involved from the original problem in question, the methods used for investigation, the findings of the study, and the discussion of the findings as positioned regarding others’ work (Merriam, 2002, p. 23). Merriam summarizes that “there is no simple answer as to what makes a

‘good’ qualitative study.... To be trustworthy, a study needs to be valid and reliable and conducted in an ethical manner” (Merriam, 2002, p. 30). Schwandt cites the notions of Lincoln and Guba (1985) regarding trustworthiness, “defined as that quality of an investigation (and its findings) that made it noteworthy to audiences”, and includes credibility, transferability, dependability and confirmability (Schwandt, 2001, p. 258). Glesne and Peshkin write that “You want your interpretations to be trustworthy.... When your colleagues also believe this, they use your work in the range of ways that trusted outcomes can be used – to confirm, expand, and inform their own work” (Glesne & Peshkin, 1992, p. 146).

The specific ways in which quality in qualitative research may be ensured are described by Merriam to include “internal validity, reliability, external validity [or generalizability], and ethics in interpretive qualitative research” (Merriam, 2002, p. 24). While issues of both internal and external validity are important, in the conclusion to their *Handbook of Action Research*, Bradbury and Reason cite Lather (1993) in referring to the “lively debate that has been referred to as ‘the fertile obsession’ with validity” (Bradbury & Reason, 2001, p. 447). It appears that Bradbury and Reason wish to continue “shifting the dialogue about validity from a concern with idealist questions in search of ‘Truth’ to concern for engagement, dialogue, pragmatic outcomes and an emergent, reflexive sense of what is important” (Bradbury & Reason, 2001, p. 447). Michael Patton also touches on the issue of truth in his discussion of making methods decisions: “A parallel concern is getting at the truth. A search for TRUTH suggests a single right answer. Qualitative methods, however, assume multiple perspectives and multiple ‘truths’ depending on different points of view” (Patton, 1987, p. 166). In their discussion of quality, Bradbury and Reason put forth a number of questions. “These questions and the subsequent choice-points they pose, allow us to consider issues of validity and quality” (Bradbury & Reason, 2001, p. 447). Of the questions they raise, such as “how the palette of extended ways of knowing is acknowledged in and by our work” (Bradbury & Reason, 2001, p. 449), they summarize by asking of the

research whether it is “worthy of the term significant?” and “emerging towards a new and enduring infrastructure?” (Bradbury & Reason, 2001, p. 454).

Regarding internal validity, which “asks the question, How congruent are one’s findings with reality?” (Merriam, 2002, p. 25), there is a common technique suggested which allows researchers “to shore up the internal validity of a study. Probably the most well known ... is triangulation” (Merriam, 2002, p. 25). Of the various types of triangulation available, Merriam cites Denzin’s 1970 identification of “four types: multiple investigators, multiple theories, multiple sources of data, or multiple methods to confirm emerging findings” (Merriam, 2002, p. 25). Two forms of triangulation used in the present study are the use of multiple sources of data as found in participants in three different nations, rather than one nation, and multiple methods, where later analytic phases using different methods elaborated the findings of earlier analytic phases, as described in the section above. At the outset of the research program, the intention was to have varied sources of data such as a background questionnaire, semistructured interviews, documents to be collected for analysis, and field notes with observations and photographs. Data consistency was deemed important, making it significant that no two schools provided the same profile of data sources. Therefore, in viewing the final collection, the most consistent forms of data went forward to analytic phases, namely those directly relating to each participant: data in the form of their background questionnaire and interview transcript.

Regarding issues of reliability, which “refers to the extent to which research findings can be replicated” (Merriam, 2002, p. 27), the suggestion arises that “since the researcher is the primary instrument of data collection and analysis” it is important to create a detailed “audit trail” (Merriam, 2002, p. 27), which Merriam cites Guba and Lincoln suggesting in their 1981 work, *Effective Evaluation*. The reason for an audit trail is so that “independent readers can authenticate the findings of a study by following the trail of the researcher” (Merriam, 2002, p. 27). Questions asked by Miles and Huberman regarding quality issues of research include “Do

the findings of the study make sense? Are they credible to the people we study and to our readers? Do we have an authentic portrait of what we are looking at?” (Miles & Huberman, 1994, p. 278). They cite Krathwohl’s (1991) comments on this subject, where “the reader can thus ‘reconstruct how an analysis developed, check the translation fidelity of constructs and the logical validity of conclusions’” (Miles & Huberman, 1994, p. 243). They also discuss the “importance of ‘transparency’ – shareability – of management and analysis procedures themselves” (Huberman & Miles, 1994, p. 428). The intention of the detailed description of the approach taken regarding the methods and results in this thesis is in great part to establish shareability, the makings of an audit trail for any interested reader.

Generalizability, or external validity, touches on the paradox of much qualitative research:

The basic question [is] ... the extent to which the findings of one study can be applied to other situations. But since small, non-random samples are selected purposefully in qualitative research, it is not possible to generalize statistically. A small sample is selected precisely because the researcher wishes to understand the particular in depth, not to find out what is generally true of the many (Merriam, 2002, p. 28).

An aspect of this study that relates to both generalizability and the limitations to this study is the small sample size of the data and the non-randomized quality of choosing schools certified to the top EcoSchools standard in their location. As one solution to these problematic issues relating to external validity, Merriam cites Patton’s (1990, p. 491) suggestion to promote thinking of “context-bound extrapolations rather than generalizations” (Merriam, 2002, p. 28), some of which are raised in the final chapter of this thesis. In some of his writing from a few years previously, Michael Patton had raised concerns about generalizing: “Another common concern about qualitative methods is the small sample size usually involved and the impossibility of generalizing” (Patton, 1987, p. 167). At that point he borrowed from Cronbach (1980) in suggesting that one approach in addressing this problem is to permit reasonable extrapolation.

Unlike the usual meaning of the term “generalization,” an extrapolation clearly connotes that one has gone beyond the narrow confines of the data to think about other applications of the findings. Extrapolations are modest speculations on the likely applicability of findings to other situations under similar, but not identical, conditions. Extrapolations are logical, thoughtful, and problem-oriented rather than statistical and probabilistic (Patton, 1987, p. 168).

Possible extrapolations of the research presented in this thesis might ask questions such as: Of the trends illustrated here regarding adults’ environmental action, what aspects are similar to and different from those trends found in the environmental actions of children? Do others find a similar progression of thick description responses appearing in relation to questions of interpretation (or knowledge) and engagement (or action), preceded by thick responses regarding a sense of connection? To what extent are the EcoSchool committee members’ views (long, wide, deep, dynamic) characterized in this thesis similar to and different from those of their colleagues in the same school? These questions are noted simply to indicate the direction in which extrapolations might proceed.

A fundamental property of good quality research of any kind is that it is ethical. Merriam suggests that “A ‘good’ qualitative study is one that has been conducted in an ethical manner.... [E]thical dilemmas are likely to emerge with regard to the collection of data and in the dissemination of findings” (Merriam, 2002, p. 29). After receiving approval, the research in this study was conducted in alignment with the Ethics Review Protocol of the Ethics Review Unit of the University of Toronto’s Research Services. Ethical issues may arise around initial access, permissions, and disclosure: “In requests to district, school, and teachers, the nature of the case study, the sponsor, the activity intended, the primary issues, the time span, and burden to the parties should be made known” (Stake, 1995, p. 57). All participants were given an initial information letter (see Appendices B and C for sample letters) and a copy of the interview protocol in advance of the day of the interviews (see Appendices F and G), with additional copies provided on the day (including Appendices H and I). Prior to beginning the interview,

each participant provided their written consent to participate (Appendix D), and were notified of their right to withdraw at any time, a choice no participant made. Additionally, a certificate of participation (see Appendix J) was provided to each Lithuanian participant, in recognition of their contributions to the study. Every effort was made to provide privacy and confidentiality for the participants through data collection, analysis and write-up. Codes, such as “LT-Admin2”, have been used to identify participants to protect their anonymity, although some individuals may be identifiable due to the nature of their role. Although no participants withdrew from the study, one Canadian school chose not to participate due to the loss of a member of its community shortly before the intended research visit. The TDSB was only additional body requiring a separate ethical protocol, which was both gained and followed. In touching on ethical considerations in qualitative interviewing, Patton provides an ethical issues checklist as helpful guidance, which as he states, “may seem straightforward enough, but dealing with real people in the real world, all kinds of complications can arise” (Patton, 2002, p. 407).

Merriam mentions an interesting point regarding ethical standards raised in Lincoln’s 1995 article, “Emerging Criteria for Quality in Qualitative and Interpretive Research”, which cites the importance of “the extent to which the research allows all voices to be heard” (Merriam, 2002, p. 30). It was the intention of this study to hear from the various professionals involved in EcoSchools, and so all adults involved in the school from the caretakers, the teachers, the administrators as well as the program coordinators were interviewed. This approach had the benefit of providing data which formed the model of sustainability perspectives with findings across all six of its stages. Each of the 30 participant voices transcribed contributed substantively to this research. The one voice on each transcription that remains backgrounded is my own, which is understandable given the purposes of this research.

Limitations

Glesne and Peshkin link the acknowledgement of a study's limitations to its trustworthiness.

Part of demonstrating the trustworthiness of your data is to realize the limitations of your study. Your responsibility is to do the best that you can under certain circumstances. Detailing those circumstances helps readers to understand the nature of your data.... Limitations are consistent with the always partial state of your knowing in social research, and elucidating them helps readers to know how they should read and interpret your work (Glesne & Peshkin, 1992, p. 147).

There were a number of limitations on this study, some of which are discussed here, while others are raised in the concluding chapter. A primary limitation was that the research trip was funded entirely through my own resources, which limited the amount of time that I could spend overseas. While I did manage to interview participants at most of the Lithuanian secondary schools that were certified EcoSchools at that time, the amount of time for my visit was limited to two days at each site. I was unable to visit one of the schools due to constraints of travelling around the nation on my own.

Another limitation is common for many researchers, in that the design and data collection phases of the project vary in scope when theory moves to the world of reality. In the case of this research, evidence of this may be found in the limited range of data sources that were possible to obtain with any degree of consistency. Although one question in the original interview schedule (Appendix F, Question 9) touched on sustainability as an issue infusing curriculum, delivery and assessment, only one school (LT-4) was able to provide me with samples from all of these various layers. Triangulation was built into data collection as part of the project design through varied data sources, but the reality was that there were so few documents and so little consistency in their type that the primary data had to be taken as the interviews themselves, along with each participant's background questionnaire. These two main limitations in my study

of lack of time and lack of data sources are touched on as Michael Patton describes three kinds of sampling limitations which often arise in qualitative research designs:

Limitations in the situations (critical events or cases) that are sampled for observation.... Limitations from the time periods during which observations took place, that is, constraints of temporal sampling; Limitations based on selectivity in the people who were sampled either for observations or interviews, or selectivity in document sampling (Patton, 2002, p. 563).

The primary limitation of time meant that participants were often interviewed only at one sitting. Those interviewed more than once, such as LT-Teach1, were asked different questions on the different days. Participants might have felt a sense of performance anxiety, or if they had time to reconsider a response, they were not actually provided with an opportunity to share it with me in a way that could be captured for formal analysis, making this another limitation to the study.

Conclusion

Methodology issues have been considered in this chapter in three main sections, covering the context of the methods used for this thesis project, the implementation of the methods, and general considerations regarding ethical, good quality qualitative research. This is a case study of certified secondary EcoSchools which involved 30 participants in semistructured interviews in the spring of 2006. The primary data of the interview transcripts proceeded through four analytic phases: Phase 1, which involved mainstream qualitative analysis techniques in creating the transcript documents and coding the data; Phase 2, which condensed the extended text through data display; Phase 3, which developed and then used a new model as an organizing technique to illuminate the patterns in participants' responses; and Phase 4, which used matrix analysis as a means of further explicating these responses. This chapter serves as a bridge formed of the research questions and methods used in this study, linking the framework presented from the literature discussed in the first three chapters with the results of the analytic phases of this study as outlined in the next four chapters, prior to the concluding chapter.

Chapter 5: Overview of Data Analysis

Introduction

This chapter outlines the arc of data analysis from Phase 1 to Phase 4, with an emphasis on the latter two phases of analysis; Chapters 6, 7 and 8 expand on this analytic arc. Of the various types of data collected from each of the certified EcoSchools in this study, the communication shared in the tape recorded interviews was taken as the primary data, and correlated to the information gained from the background questionnaire (see Appendix E). The interview transcripts were taken as the primary data not only because they were the most comprehensive form of data but also because they included every participant. As outlined in the methodology, the need for four phases of analysis emerged through working with the actual data. The purpose of each successive phase was to use a variety of methods to move the outcomes and findings of the preceding phase beyond what had been possible given the methodology used. By Phase 4, the data reveal the core qualitative characteristics of an educator's sustainability framework as expressed through four perspectives: the long, wide, deep and dynamic views.

The following table presents key terminology employed in the four phases of analysis. The brief descriptions in this table will be expanded upon in the course of the results chapters but it is positioned here for ease of reference.

Table 4
Terminology for Results Chapters

Term	Description
horizontal analysis	analysis of responses by stages, using subthemes to develop portraits and word maps for selected participants at each stage
model of sustainability perspectives	a six-stage model, emerging empirically from the study data, that describes the sustainability frameworks of participants in terms of their patterns of responses across the three question strands
portrait	a part-textual, part-visual characterization of a participant's responses, through an interpretation based on the participant's pattern of subthemes

précis documents	these documents (see Figure 6 in Chapter 4) condense the extended transcript text into a more concise format, used to identify patterns of response
response style	dyadic characterization of response into thick or thin style, used to identify Phase 3 response cohorts; after Ryle (1968/1971) and Geertz (1973/1975)
thick response style	multilayered, holistic style of response
thin response style	single-layered, linear style of response
stage	one of six stages in the model of sustainability perspectives, representing a cohort of participants with a particular pattern of thick and thin responses across the three strands of questions
strand	one of three distinct groupings – connection, interpretation and engagement – of the top ten questions
connection strand	strand of four questions relating to factors expressing a participant's personal and conceptual connection to the environment
engagement strand	strand of five questions relating to a participant's approach to sustainability learning in an active sense, particularly as relating to program aspects
interpretation strand	strand of one question relating to a participant's interpretation of ESD or education for a liveable future
subtheme	a key word or short phrase identifying an idea that recurs in multiple responses; subtheme counts generate respondent-by-word matrices used to identify patterns of commonality among responses
common subtheme	a subtheme occurring in responses to multiple questions (18 different common subthemes arise in the analysis)
particular subtheme	a subtheme occurring in responses to only one question (10 different particular subthemes arise in the analysis)
sustainability framework	the cognitive-affective aspects that an individual brings to sustainability and sustainability learning at a given point in time
sustainability perspective	the sense or awareness of sustainability that an individual experiences through the medium of their sustainability framework at a given point in time
'top' ten questions	the questions (out of a total of 18; see the alternate interview schedule, Appendices H and I) that emerged through analysis of the précis documents as having the fullest pattern of response among the participants
vertical analysis	question-by-question analysis of responses to top ten questions, tracking subthemes and determining response style as thick or thin
views of participants	one of four holistic views – long, wide, deep and dynamic – that characterize overall perspectives on sustainability and sustainability learning
deep view	view characterizing a perspective in which self-awareness deepens in relation to environmental questions; relates to the engagement strand
dynamic view	view characterizing a perspective encompassing a shift to process-oriented, whole-system perspectives; relates to all strands in a background sense
long view	view characterizing a perspective in which a sense of beyond-proximal time and space develops; relates to the connection strand
wide view	view characterizing a perspective in which the scope of awareness broadens; relates to the interpretation strand
word map	the visual component of a participant's portrait, in which subthemes are employed to reveal connections among the participant's responses

The results of this research are presented in overview in this, the first of four results chapters, which highlights key outcomes and salient findings.

Initial Analysis of Data

Phases 1 and 2 are considered to be initial analyses of the data and stand as a prelude to the more powerful model of sustainability perspectives that emerges in Phase 3 and the details of participants' views, emerging in Phase 4. The emphasis in the initial analysis of the raw data is on the interview transcriptions, with periodic use of the background questionnaire information (see Appendix E for the questionnaire and Appendix Q for a summary of the results).

Phase One Analysis

As the primary source of data was provided by the interview transcripts, the starting point for formal data analysis was coding of the participants' responses according to mainstream qualitative methodology as discussed in the previous chapter. The codes applied reflected themes on various organizational levels. Apparent at this stage through the initial handling of data, which included tracking codes and memoing regarding developing patterns of codes, were both the variety of perspectives shared and at the same time the beginning of echoes among participants in different schools or nations. However, discerning meaningful patterns and priorities of meaning within the data required a deeper methodology, as detailed in Chapter 4. As an indication of the type of insight gained during Phase 1 analysis, participants' comments might range from the specificities of an individual's role, such as a teacher's craft in the classroom or an administrator's management of school-wide issues, to wider concerns regarding, for instance, the role of the outdoors in an individual's life experience or the importance of authentically caring for the development of citizens entrusted to the professional educator. In broad terms there seemed to be many similarities among schools and nations in the range of

codes. In some instances the similarities seemed driven by the participant's role, but often the similarities seemed to go beyond the common groupings of role, school or nation.

Examples of comments that did seem to relate to the common grouping of job role are those perspectives shared by the nine school administrators. Within this group of participants the commonalities of their job within the school were clearly reflected in their interviews, transcending what might have been the more obvious linkages to their school or nation. Typically, an administrator's comments would reflect their strong educational expertise, would express a long and wide view of things, as detailed in Chapter 8, and could more easily be distinguished as those of an administrator than as those of a Canadian, Lithuanian or Swede. Thus, administrators would make comments about the program's long-term success being dependent on the type of student that would attend their school, put the present moment into historic or cultural context, or comment on the place of the EcoSchools program in relation to the institution's broader considerations of staffing or budget. For instance, in response to a question regarding going beyond certification (Q9 in the 'top ten' numbering; see Appendix L), a Swedish administrator pointed out that

It depends very much on the pupils who are coming here (SV-Admin2, p. 15).

A Lithuanian administrator also commented on the type of pupils in the school, but in response to a question (AQ2a) not included beyond initial data analysis, as outlined in the following section. He stated that:

Now have bright pupils and spiritual strength – strength will come from within Lithuania (LT-Admin2, p. 8)

In response to the next question (AQ2b, which became Q9 in the 'top ten' numbering), which was included in the top ten interview questions, he underscored the importance of the type of student in attendance:

Without bright students, we won't do anything (LT-Admin2, p. 8).

Both administrators were touching on the issue that a major factor of influence on their work relates to the students themselves, the selection of which staff have very little control over in public sector schools.

Besides a sense of consistency among the administrators relating to the actions taken in their job and their communication style in a research setting, there was a sense that as a group these participants had a strong understanding of and connection with the environment, and were concerned about future generations and issues affecting individuals outside of their own nation. Although strongest among the administrators, the use of coding in Phase 1 provided similar insights in the other groupings according to role, school, nation or perspective. In all cases there were a variety of findings that seemed to go beyond the responses to the interview questions, with the possibility of revealing further meanings given deeper analysis.

Phase Two Analysis

The entry-point for each successive phase of analysis was provided by the results from the previous phase, including both the actual findings and the shortcomings. The purpose of Phase 2 was to shape a methodology that would allow for an easier handling of the large data set by consolidating to a form more manageable than that provided by the hundreds of pages in the complete collection of transcription documents. The précis documents were created to condense the extended transcript text into a more concise format through an effective data display. With the data in this form, I was able to handle the participants' précis documents physically, moving them to juxtapose and compare, in order to note similarities, differences and gaps (see Figure 6 in Chapter 4).

When working with the précis documents, a clearly apparent feature was the amount of white space visible on each square representing the response to any given interview question. Whereas Appendix K indicates a more absolute picture of each question that was asked and had

some response given, the précis documents give an indication of the greatly varying extent of the responses, as well as many instances in which questions were not answered at all. One of the first outcomes from the Phase 1 and 2 analysis, therefore, was the prioritizing of the interview questions from the 18 listed in the alternate interview schedule that I had been tracking to those ‘top’ ten questions that were most consistently used across all nations’ participants, which then became the only questions used in the later phases of analysis. The source of these ten questions can be described as follows: from the original list of 12 questions used at the very beginning of Lithuanian interviews; from the alternate list of 18 questions that served as the basis for interviews with all participants (including second interviews with those Lithuanians who had responded to the original schedule); in some cases from both lists, as may be seen in Appendix L.

While some interview questions were dropped due to the requirements of the analysis, there were also some participants who featured in the analysis to a lesser extent than others from Phase 2 onwards, as explained in Chapter 4. The reality of the structure of the interviews was that significantly more time had been allotted to the research in Lithuania (two school days) than in Sweden (one school day) or Canada (half of one school day for formal interviews). The time limits were beyond my control and did affect the number of questions that could be asked and the style of response that could be given. Also, three of the participants who had an unusual amount of blank space on their précis documents (CA-Admin2, LT-Admin1, LT-Teach4) were dropped for the Phase 3 analysis due to limited data. All three actually had their interviews cut short by professional or personal emergencies, limiting the amount of time they had to participate. Every effort was made to include these participants as far as possible; their voices are heard at various points in the thesis, for instance all three of these individuals are included within the vertical analysis of Chapter 6, and LT-Admin1 and LT-Teach4 are included in the analysis of participant views of Chapter 8. For these participants, the significance of the loss is

not so much through not including them more fully in the study, but rather through the answers they might have provided if they had been in a position to complete the interview, as well as the possibility of being staged and thus contributing to Chapter 7.

As shown in Appendix K, some individuals did respond to the nine questions that were dropped due to a lack of data in the aggregate, while a few of the Lithuanian participants also responded to some of the original questions, drafted prior to the revisions necessitated early in the data-gathering process. While the response data for the dropped questions did provide useful extra material, allowing a greater understanding of these participants in some ways, insufficient consistency across all participants meant that what can be drawn from these responses as part of an overall pattern is rather limited. The voices of two of the national coordinators who provided all thick responses to the top ten questions are included here, in order to include some of the dropped question responses.

One question which was not included in further analytical phases was OQ12/AQ5: “Is there anything else you would like to tell me?” (see Appendices F through I). To this, both the Canadian and Lithuanian coordinators responded, as seen in the following excerpts:

There’s a difference between programs and people – they’re so individual. You need an understanding of human nature, how we tick, and how change really happens – there are so many aspects to it, and how you get people to change. To promote the environment, you need to promote the economic and social dimensions and the connections between them (CA-Coord, p. 59). It’s important to manage transitions in the program sustainably – so it continues in future (CA-Coord, p. 60).

After a long interview sharing her insights, these final points made by CA-Coord showed the extent of her belief in a unique mode of responding to the set of conditions faced by each school in shaping a liveable future, as well as the related aspects of communication, the three spheres of

ESD, and the importance of leadership in the program. At the end of his first interview, LT-Coord stated that:

I am satisfied at work – especially when talk with schools.... The most important thing is talking with teachers and students – how they see, think, feel. And because these visits make a difference, actually (LT-Coord, p. 24).

This excerpt expresses his view of the importance of the personal visits paid by the national coordinator to each of the schools engaged in the program.

In response to another dropped question (AQ3i), “What questions do you think I should be asking to understand the EcoSchools project here?” (see Appendices F through I), the response by the Canadian coordinator revealed her interest in fostering individual sovereignty. She said:

And my job can’t be to convince you to think exactly like me – it’s got to get us all at least facing the same way, and getting there, whichever way we can (CA-Coord, p. 3).

This statement by CA-Coord is of great significance and touches on an issue that will be raised through the discussion of the views of the participants outlined in Chapter 8, particularly the dynamic view and its essential subtheme of thinking. The core of sovereignty is the notion of authentic choice, which requires a capacity to develop and apply skills for and by the individual. In her statement, the Canadian coordinator points to this view of sovereignty. In some ways, this excerpt mirrors that of LT-Coord shared just above, as he stated that he understands that an important part of his job is to visit the schools and to get an inside view into their experiences regarding “how they see, think, feel”, which would allow him not only to understand them better, but possibly to help them in more skillful ways.

It was the data in the form of précis documents that allowed more fluid comparison between responses of participant. For instance, two of the schools involved, from different

nations, were not mainstream secondary schools but rather catered to special needs children in a modified program or offered an alternative learning program. Being able to juxtapose the participants' responses in a close fashion allowed the echoes present to become more apparent. Part of the success of the EcoSchools program in both of these schools was that it could be uniquely tailored to the needs of the students and school ethos, working well in a situation of differentiated learning and teaching styles.

The most significant finding of Phase 2 analysis was that the range of responses to any given question appeared to follow a global pattern beyond the obvious links to role, school or nation, captured by the use of thick and thin style of responses. An example of a question that exhibited differences in response styles was AQ3c, which became Q8 and Q9 in the 'top ten' numbering, and in which the style of indications of successes and challenges faced in the program went beyond school, role or nation. Revealing the significance of the style of responses was beyond the scope of the Phase 2 methodology, but suggested the beginnings for Phase 3 analysis.

Phase Three Analysis and a New Means of Comparison

In analysis Phases 1 and 2, all 30 of the participants were involved. In Phase 3, 27 participants were involved, excluding the three participants whose interviews had been curtailed due to personal or professional emergencies. Having determined that the range of responses to each question could broadly be characterized into two domains of *thick* (multilayered) or *thin* (single-layered) styles of response (after Ryle (1968/1971) and Geertz (1973/1975); see Chapter 4), the starting point for Phase 3 analysis was the observation that almost every participant shifted the descriptive quality of their responses (thin or thick) at least once in their interview responses. This shift was first apparent in the smallest cohort by nation, the Swedes, where every participant made this shift one or more times. The top ten interview questions could be

seen in three broad strands of interpretation, connection, and engagement, with each question within the three strands having thick or thin response styles. Phase 3 analysis shows the tracking of the emergence of thick responses, from one participant with a response profile being homogeneously thin with respect to all questions to three participants with homogeneously thick responses to all questions. The majority (23 out of 27) of participants in this study with sufficient data to assess from this point of view had heterogeneous response profiles, with a mixture of thin and thick responses. The sequence of the emergence of thick responses was in a replicable pattern from connection to interpretation to engagement strand, falling for this data set into six stages. The resultant grouping of participants into stages created a new lens, which allowed for comparisons among participants and the gaining of structural insights through both Phase 3 and Phase 4 analyses.

Analysis of Thick and Thin Response Cohorts

The watershed methodology of Phase 3 was the categorization of participants' statements with respect to each of the top ten questions into a thick or thin response cohort. This analysis phase involved a tracking of the progression of the appearance of thick responses, which then determined six stages of response patterns. A detailed illustration of both thick and thin responses to each of the ten questions is provided in Chapter 6, with this section serving as an overview.

The trend of thick responses seen in each nation is the same, suggesting that there may be value in determining exactly what the pattern is and linking the pattern to overarching themes or drivers for the responses. The determination of a statement to be included in the thick or thin response cohort depended on the parameters of the particular question. A thick response is one that tends to reflect qualities such as a participant's capacity to connect concepts not directly related, to reveal an understanding of an issue beyond the ordinary application, or to support

action that will be of benefit to individuals beyond those within their pedagogical care in either time or place. The essence of thick responses relates directly to the creation of a liveable future through a broadened set of motivations, understandings and actions. The Stage 6 participants giving statements to all of the top ten questions that were categorized in the thick response cohort portray the most consistent perspective about what a liveable future entails and the means by which it may be supported.

In contrast, thin responses tend to be less holistic, revealing aspects of mental constructs that support a separatist view of people, places, concepts, time frames or responsibilities (or at least concealing the converse). As every participant in this study is employed at a certified EcoSchool, often the thin responses show emerging qualities of what would become a thick response if it were more developed, so care was taken to be as consistent as possible in the placement of participants' answers into either the thick or thin response cohort. As participants in Stages 2 through 5 have varying degrees of heterogeneous mixture of thin and thick responses, their responses portray aspects of the perspectives shared by the Stage 6 participants, yet lack their consistency.

A significant point to make is that whatever words are used to sort participants' statements into cohorts, these groupings represent variations on a given theme, rather than 'better than' or 'worse than' cohorts. As outlined in Chapter 4, an essential quality of thick descriptions is that they build on the foundations laid by thin descriptions, something mentioned by both Ryle (1968/1971) and Geertz (1973/1975) in their initial characterizations. The participants of this research were members of the EcoSchools committee, with each individual an essential member of that team, helping to ensure their school would attain and maintain certification. More than that, it was the enormous variety of statements that provided the data from which this analysis springs, and without which it would have been impossible. Overwhelmingly significant are the differences apparent from the range of statements in this study, providing the required breadth

for this research, rather than any emphasis on a ranking of responses. The framework established by the interview question can be viewed in this connection simply as a way of registering the participants' perceptions, as discussed further in the next chapter.

Horizontal Analysis of Six Stages

While the style of response analysis to interview questions revealed the existence of six discrete stages of participants' responses from homogeneously thin to homogeneously thick through four heterogeneous intermediate stages, the horizontal analysis compared one stage to another and clarified the defining characteristics of each stage. A detailed illustration of interview responses for each stage is outlined in Chapter 7, with this section serving as a general overview.

Each stage has a relative balance of thick and thin responses to the questions in the strands of interpretation, connection and engagement. Table 5 below outlines the characteristics of each stage as well as the relative balance of response types. The differentiating shift taking place across the stages is the emergence of the thick responses, which appear first in connection, then in the interpretation strand and finally in engagement. Associated, or secondary shifts are also taking place, notably that of the style of articulation of participants' responses, contributing to thicker responses generally. Although this does relate to the expressiveness of the speaker, the sense taken here is more directly linked to the speaker's clarity regarding the quality of their intentions, motivation, understanding of and actions taken with respect to the issues. In a replicable manner, articulation increased first with respect to a participant's motivation, then to their actions, and finally to results, following the line of the action equation, as discussed in Chapter 3. Often what appeared to significantly motivate a participant related to concepts discussed in the connection strand of questions, such as the importance of a liveable Earth for themselves, their family, and generations to come within their community and beyond it.

Table 5***Characteristics of Stages***

Stage	Interpretation Q1	Connection Q2–Q5	Engagement Q6–Q10	Characteristics
1	τ	τ	τ	Thin responses on all top ten questions; stated importance of program yet sustainability not differentiated from educational goals; thin quality of articulation generally
2	τ	τ (mixed)	τ (mixed)	Thin ‘interpretation’; emergence of thick responses in ‘connection’ and ‘engagement’ yet with majority of responses thin; increased thickness of articulation of motivation
3	τ	T (mixed)	τ (mixed)	Thin ‘interpretation’; majority of ‘connection’ responses are thick; majority of other responses thin; increased thickness of articulation of actions and results
4	T	T (mixed)	τ (mixed)	Thick ‘interpretation’; majority of ‘connection’ responses are thick; majority of ‘engagement’ responses are thin; some insight of connections through space, time or issue
5	T	T (mixed)	T (mixed)	Thick ‘interpretation’; majority of ‘connection’ and ‘engagement’ responses are thick; increased insight into connections through space, time and environmental issue
6	T	T	T	Thick responses on all top ten questions; thick quality of articulation, especially relating motivation, action and results in creating a liveable future

Note. τ = all thin;
 τ (mixed) = majority responses thin, mixed with some thick (in engagement strand) or equal numbers thin and thick (in connection strand);
T (mixed) = majority responses thick, mixed with some thin;
T = all thick

In studying the six stages, the overarching perspectives or views shared by the participants (wide, long, deep and dynamic views; see Chapter 8 for more development) become apparent, but aspects such as articulation transcend even these larger views. Even though this data set is small, its internal integrity comes across through the extent to which the trends hold true between

nations, schools, roles and individuals, suggesting that the data touch fundamental qualities that relate these EcoSchools, such as sustainability itself.

An example of the changes brought about by the shift from thin to thick responses within one strand can be seen in the difference between the first and second halves of the stages outlined in Table 5 above. The first three stages are all characterized by a thinner pattern of responses in the interpretation strand, with the second three stages having a thicker pattern of responses in this strand. A thinner interpretation-strand response pattern would reflect some level of disconnection among issues, with a focus on one sphere of SD, such as the environment or the economy, over the others; or general educational and ESD-specific issues would be conflated. Thick responses more clearly reflect the interconnections of things and an understanding of sustainability as process rather than product. While the interpretation strand had but one question, the connection and engagement strands had four or five questions each, so the shift from thin to thick responses happened incrementally, as will be discussed in greater detail in Chapter 7. In general, as can be seen under the heading of characteristics in Table 5, the thin-to-thick shift for connection reflected a trend of expressing expanded perception of the self relative to others and the environment in time, space and issue. The shift for engagement reflected a broadened perspective from an entity not far removed from waste management and legislated education to a deeper view regarding the possibilities of shaping or nurturing citizens capable of creating a liveable future.

The following table outlines the distribution of participants involved in each stage by nation and role:

Table 6***Summary of Participants' Stage by Nation***

Stage	Canadian participants	Lithuanian participants	Swedish participants
1	—	LT-Care	—
2	CA-Teach2 CA-Teach7	LT-Teach1	SV-Admin1 SV-Teach1
3	—	LT-Admin3 LT-Admin4	SV-Care
4	CA-Teach4	LT-Admin5 LT-Teach2 LT-Teach5 LT-Teach7	SV-Admin2
5	CA-Admin1 CA-Teach1 CA-Teach3 CA-Teach5 CA-Teach6	LT-Admin2 LT-Teach3	SV-Coord SV-Teach2
6	CA-Coord	LT-Coord LT-Teach6	—

Stage 1 is characterized by thin responses in the 10 questions across all three strands, with one Lithuanian participant included in this stage. Stage 2 is characterized by the appearance of thick responses in both the connection and engagement strands, albeit not in a majority for either strand. Participants from all three nations are represented in this stage, with a total of five participants (two Canadians, one Lithuanian, two Swedes). In Stage 3, there is an increase of thick responses in the connection strand so that although still mixed, the majority of a participant's responses are thick. Although no Canadian participant was involved in Stage 3, a total of three participants from Lithuania and Sweden are involved (two Lithuanians, one Swede).

The latter three stages are all characterized by a thick quality of response in the interpretation strand. The key difference between Stage 3 and 4 participants is the thickness of their responses in the interpretation strand, as the connection and engagement responses have a similar profile (T (mixed) and τ (mixed) respectively) for both of these stages. Each nation is represented in the six Stage 4 participants (one Canadian, four Lithuanians, one Swede). The difference between Stage 4 and 5 is that Stage 5 participants have a majority of thick responses in the engagement strand. Stage 5 is the largest stage cohort, representing all three nations (five Canadians, two Lithuanians, two Swedes). With a total of nine participants, Stage 5 contains as many participants as the first three stages together. The response profile for Stage 5 participants is heterogeneous as it includes some thin responses in both connection and engagement strands. The difference between Stages 5 and 6 is that participants' responses are homogeneously thick in Stage 6 across all ten questions in the three strands. There are no Swedes involved in Stage 6, which includes three participants (one Canadian, two Lithuanians). Out of the original 30 participants, the overall distribution indicates nine in the first three stages (1–3) and 18 in the latter three stages (4–6), with three participants' data being insufficient to include them in this and later stages of analysis.

Using the Stages Model as a New Means of Comparison

The stages model as a means of comparing participants, and additionally of deepening insight into their sustainability frameworks and perspectives, can be used to emphasize either matrix or interpretive analyses. The matrix-analysis approach (Miles and Huberman, 1994) is first considered here in Phase 3 analysis to achieve clarity regarding the background of the participants when considering them under the different organizing cohorts of stage, nation or role. This may be considered an illuminative phase of analysis, in which the patterns underlying the model of sustainability perspectives emerge (Patton, 2002, p. 486). The Phase 4 analysis

develops this approach further and more interpretively, providing reflections regarding the nature of ESD itself. This may be considered an explicative phase of analysis, in which further dimensions of meaning are explored (Patton, 2002, p. 487).

As an overview, the following graph shows the distribution of participants' stages by nation:

Figure 7. Stage of participants by nation.

The Lithuanians are the only nation represented in every stage, with a clear peak of participants at Stage 4. The peak for the Canadian participants is Stage 5, with no clear peak for the Swedes, due in part to the small cohort size. The fact that the two clear peaks occur in the later stages underscores the fact that the participants' membership in the stages is not symmetrically distributed, but rather skewed towards the latter stages. This result can be understood in the context that all participants are involved in active, certified EcoSchools programs. A more detailed breakdown of the participants by nation, school and stage is shown in Appendix P.

Participants were grouped according to their stage and nation to show their average age and years of experience in the field of education (see Appendix Q). Comparing the first three stages with the latter three stages shows that while there is little difference in the average number of years of experience, there is a marked difference in average ages, with the latter stages having

a lower average age. The widest possible age range is involved in almost every stage, from the youngest participants, those in their 20s in Stages 2, 5 and 6 to the oldest participants, those in their 60s in Stages 1, 4 and 5. This suggests that age is neither a barrier to the latter stages, nor a determining factor of stage membership. The fact that the participants in the latter three stages are on average about a decade younger than the first three stages may point to youthful enthusiasm regarding mastery of ESD or it may reveal that the participants in the last three stages bring a clarity of intention on entering the field of education, perhaps beginning there rather than coming to education as a second career as members of the earlier stage cohorts may have done. The presence of some older participants in the latter stages suggests that these professionals are dedicated to their own learning, tending to keep abreast of developments and contributing to pockets of enthusiasm. The age spread in the latter stages thus provided a useful opportunity for additional triangulation of the data.

When comparing participants' stages by nation and their role in the school, the small data set in each strand is apparent, yet some points remain worthy of note. Since the lead teacher designation covers the whole range of stages within a given nation for all the teachers, there is one entry, 'all teachers', in the following summary table, without distinction between the lead teacher at a school and other participating teachers.

Table 7

Summary of Stage of Participants by Role

Role of participant	Canada	Lithuania	Sweden
Coordinators	6	6	5
Administrators	5	3, 4, 5	2, 4
Caretakers	0	1	3
All teachers	2, 4, 5	2, 4, 5, 6	2, 5

There are two types of role where participants are exclusively in the first or latter three stages: the caretakers (the definition and scope of this designation was variable) are in the first three

stages and the national coordinators are in the latter stages. The other roles of teachers and administrators include almost the full range, from Stage 2 to 5 or 6. At various sites, lead teachers, other participating teachers, and caretakers all have the numerically highest designated stage at their school. At five schools the administrator had the same designated stage as a teacher, but in no instance a higher designated stage. The EcoSchools committee was generally made up of teachers, administrators, caretaking staff, students, and in some instances other individuals such as parents or the school nurse (such as at LT-2). The broad range of stages within the roles and the fact that any member of the EcoSchools committee in a school might be designated at a numerically high stage underscores the value of a multi-stakeholder committee and suggests that a person's role does not constrain that individual's stage designation.

Although roles of administrator, caretaker and teacher each play an important part in the EcoSchools committee, the role of the lead teacher is of particular interest as this is the designated person for much of the initiation and execution of the program. In the most numerous national cohort of lead teachers, the Lithuanians' stages range from 2 to 6. For both Canada and Sweden, the lead teachers' stages include participants represent a similarly wide range, from Stage 2 to Stage 5. The lead teacher often had the same stage or numerically higher than the other participants in their school, but this was not always the case. Out of the 10 schools, in four instances the lead teacher was higher than others' stage, once the lead teacher was at a numerically lower stage than others, four times they were at the same stage, and in one school (CA-4) there was only one staged participant. This suggests that regardless of the point in an individual's own development of understanding of ESD, they have the capacity to steer a school towards EcoSchools certification. It also emphasizes the value of input from the whole EcoSchools team, with participants at various stages having the ability to contribute to a successful program. However, the ways in which individuals in different roles and at different

stages interact to shape a program and the extent to which they may be barriers or drivers to the program's success would require more intensive study to determine.

Phase Four Analysis of the Data

The first three phases of analysis use qualitative data in increasingly matrix-based ways, resulting in the proposed staged model of six stages of ESD, with a majority of thick responses appearing first in connection, then in interpretation, then in engagement, regardless of the participant's nation, school or role. By the end of the final phase, analysis is explicative in character, with the intention of gaining deeper insight into general patterns underlying participants' responses. This section serves as an overview to insights from Phase 4 analysis, consisting in four holistic views of ESD, the details of which are provided in Chapter 8.

As responses in each of the three strands of question shifted from thin to thick, coherent perspectives became apparent, independently of participants' role, school or nation. Associated with the shift in the connection strand of questions is the long view. The wide view is associated with the shift in the interpretation strand and the deep view with the engagement strand, with a dynamic view emerging overall, as shown in the table below:

Table 8

Characteristics of Participants' Holistic Views

Strand of question	Type of view	Primary characteristic of view
Connection	Long	Shift beyond proximal time and space
Interpretation	Wide	Shift of perspective among choices
Engagement	Deep	Shift towards sovereignty of individual
Overall	Dynamic	Shift of thinking

The commonality of the perspectives or orientations represented by the long, wide, deep and dynamic views is that each of them expresses a change in perspective in their given dimensions from a sense of isolation and self-orientation towards a more expanded understanding of the interconnections between self and experienced conditions regarding the living and non-living

parts of the world, as well as aspects of sustainability's driving forces. A predominant theme of these holistic views relates to the analogue rather than digital nature of ESD in that a range of options, rather than a narrow set of prescribed actions, lead toward a more sustainable future. A goal of ESD is to support educators as they face their unique conditions and craft sustainable choices informed by these holistic views; such individuals, at whatever stage of the model of sustainability perspectives they find themselves, may be referred to as sustainability chefs.

Conclusion

This chapter has outlined the progression of data analysis from initial coding of interview transcripts to the final phase involving participants' holistic views regarding sustainability. The designation of questions into connection, interpretation, and engagement strands aligns to some extent with the models of learning outlined in Chapter 3 that have been proposed by Stephen Sterling (2003) regarding seeing, knowing and doing, and Gregory Bateson, identifying the phases of learning I, II and III (Bateson, 1972/2000). Later chapters will serve to provide the detailed tracking of response to stage designation as well as a more complete outline of the holistic views. The primary intention throughout the four phases of analysis was to work with the data themselves in an appropriate way, allowing the outcomes and findings to arise from information shared by the participants themselves. While it is possible to distinguish an educator's national voice in that, for instance, the Lithuanians' contributions were slightly different from their Canadian or Swedish counterparts, revealing a somewhat deeper sense of connection with the land, the enduring finding is the commonality beyond nation or job role, towards an understanding of the nature of sustainability and the means of moving towards a sustainable future.

Chapter 6:

Vertical Analysis of Data

Introduction

A primary step in the shaping of the model of stages outlined in Chapter 5 is the response style analysis of the data: determining whether any given participant's response is a member of either the thick or the thin response cohort for a particular question, the details of which are provided in this chapter. The number and progression of thick responses then determined a participant's stage. For each question, subthemes, discussed in the context of coding in Chapter 4, were identified in responses and then tracked, with *common* subthemes appearing in two or more questions, while *particular* subthemes appeared in relation to only one question. Each word or phrase employed as a subtheme can appear in a different form, with for example 'action' being understood by the word 'doing' or 'activity', or even a statement of something that had been done. A flexible understanding of each subtheme is required. As Miles and Huberman state, "A chronic problem of qualitative research is that it is done chiefly with words, not with numbers. Words are fatter than numbers and usually have multiple meanings" (Miles & Huberman, 1994, p. 56).

A significant point to note at this juncture is that the response architecture, outlined in detail in the following sections relating to each of the ten interview questions, has strong links to the meaning related by the participants. Although some readers may question the link between architecture or structure of response to its content or function, in fact there is a strong relationship between the two. In other fields the link between structure and function is apparent. For instance, in the field of biology the importance of the relationship between structure and function cannot go unnoticed and may be detected at various scales from the microcellular, cellular, organ, organism, and ecological system. A similar situation is found in the field of

design, whether that of objects such as furnishings or collections of objects such as buildings. Contemporary and ancient examples can be found in creations such as Frank Lloyd Wright's Fallingwater country house near Pittsburgh, Pennsylvania, or the Roman theatre in Orange, France, where function may be revealed through architecture. American architect Louis Sullivan made the point, "form ever follows function" in 1896; thus, structure reveals meaning.

It is the pervading law of all things organic and inorganic,
Of all things physical and metaphysical,
Of all things human and all things super-human,
Of all true manifestations of the head,
Of the heart, of the soul,
That the life is recognizable in its expression,
That form ever follows function. This is the law (Sullivan, 1896).

In a similar vein, the relationship of structure and function is of significance in this thesis, where the means of detecting the latter is through the more accessible detailing of the former, with examples highlighted throughout this chapter.

Finally, this chapter is characterized by a highly detailed investigation of participants' responses. While such an approach may seem a departure from the more fluid style that is naturally associated with the non-protocol-based approach of a sustainability chef, it is important to recognize that the model of sustainability perspectives and the views that flow from it are underpinned by the close analysis presented in this chapter. To quote a saying often attributed to another architect, Ludwig Mies van der Rohe, "God is in the detail" (O'Brien, 2012, p. 887).

Subthemes Occurring in Responses

For general guidance, the following glossary provides an indication of the sense ascribed to each subtheme, given the contexts in which it was found. Appendix R indicates the number of subthemes associated with each question, as well as an indication of the number (or range) of subthemes attributed to thick and thin responses.

Table 9***Glossary of Subthemes***

Subtheme	Description
action	doing, or expressing a definite desire to do, something with tangible results
<i>appropriate scale</i> ^a	often relating to action; appropriate and relevant to the scale of situation at hand
balance	making choices based on varied and perhaps conflicting criteria for sustainability; living in harmony with natural world; balancing problems with solutions
<i>change (nature of)</i>	how change takes place, what is involved; family influence, generational change (bottom up); may touch on legal or administrative issues
choices	options among alternatives; often no obvious “right” choice; considering different perspectives
citizen	active, empowered member of electorate; connects subjects with real-world relevance; has sense of national identity connected to nature
consequences	repercussions; linking action and effects; individuals may compare acts chosen and their effects on the surroundings
<i>daily activities</i>	often having impact on environment; little things you can change; may be learnables
<i>environmental literacy</i>	breadth of educative approach; ensuring stable, practical foundation in understanding environmental problems and issues; infusable into any subject
<i>examples (concrete)</i>	value in illustrating positive results; tying learning to experience
imperfect	incomplete or small beginnings are necessary to initiate action; change starts with incremental, potentially flawed or uncertain steps; here-and-now successes for students
independence	empowering students and individuals to act for themselves in a sovereign fashion as problem solvers
<i>integration</i>	infusion of sustainability into school practices and values; manifested through how organization or teaching practice works
interconnections	everything affects everything else; seeing self or humanity as part of nature; acting through nature’s law
leadership	arising at individual, group, school, or nation level; doing useful things, leading the wave; teacher perspective: equipping students with skills to make changes in the world
motivation	has to be intrinsic, or second nature; motivation comes first; impetus to act
<i>multiple barriers/drivers</i>	individual to systemic range of responses; problems and solutions
<i>multiple impetus</i>	what initially got an individual engaged as more than one entity
one person	power of individual to bring change about; initiating projects
patience	not being immediately disheartened, accepting incremental or delayed change; requires trust in process; actively working for generational change

personal	expressing views that reflect the individual; may involve family or spiritual life
<i>real life</i>	life experienced outside the confines of school; moving beyond the theoretical
responsibility	reflects sense felt by an individual towards themselves or expanding circles of concern in their school and larger community; teachers may express as their duty of care
thinking	the manner in which an entity is conceived; may imply change of thinking over time; careful consideration of a situation
<i>three ESD spheres</i>	environment, economy, society
time	describing the amount of time needed; extending the temporal dimension to time past or future
topophilia	expressing a love of nature; an affective response to nature through enjoyment of being in nature in quiet or active ways
values	internal compass guiding priorities

Note. ^a Italics indicate particular subthemes, occurring in one question only

A subtheme was included in the analysis if it recurred in statements made by two or more participants either in one question or between questions of the passages chosen for coding. For the ten questions used in Phase 3 and 4 analyses, there were a total of 18 common subthemes and ten particular subthemes. Both thin and thick responses could touch on common and particular subthemes. However, as will be illustrated in the sections to follow, thin responses might touch on but one aspect of a more complex subtheme, such as only one of the three dimensions of the ‘three ESD spheres’.

This analysis counts appearance of subthemes rather than their repetitions within any given statement. Therefore, the data within the subthemes tables for each of the individual questions (see Tables S1–S10 of Appendix S) are represented by either a blank space equating to no mention of the subtheme, or as 1 if the participant mentioned the subtheme, regardless of any repetitions of the subtheme in that statement. These were then summed across questions for each of the three strands as well as overall, as indicated in Tables T1–T4 of Appendix T. In general, as Appendix R indicates, thin responses make reference to one or two subthemes, whether common or particular, whereas the numerically lower end of the range of the number of subthemes included in a thick response is greater by at least one and this range extends to up to

half of the total subthemes for a given question. For instance, if the thin responses for a question all mention one or two subthemes and the total number of subthemes for that question is 16, then the thick responses might have a range of three to eight subthemes mentioned (see Appendix R).

The numerical trends presented here and other analytic methods included in Phase 3 and 4 analysis, such as graphs and word maps, are created in an effort to convey aspects of the content of the interviews. However, there are a number of limitations in portraying via matrices the richness of what was shared and perceived during the school visits. For instance, an expanse of information was shared that was impossible to quantify, such as non-verbal communication in body language, looks, gestures towards samples of students' work or the built environment that created an important backdrop to the formal recorded exchanges. Additionally, some information is lost in the vertical analysis of questions in that all subthemes have equal weighting in numeric trends, yet some subthemes may link to a broader range of statements and concepts than others, as may be seen when comparing, for example, the subthemes of 'motivation' (broad) and 'daily actions' (narrow).

Another way of viewing the issue of lost data may be through analogy, equating a participant's statements to a mixture of light waves passing through a polarizing filter. If much of the light is transmitted, the statement is a designated thick response. A thin response in this situation is the result of less light being transmitted through the filter, leaving more of the light to be reflected off the filter, for possible use elsewhere. Membership in one or the other response cohort has not so much to do with a statement of quality wherein one "light signal" is seen as innately better than another, as with the type of filter being used selecting for light with certain polarization characteristics to be transmitted, resulting in light waves from some sources passing through to a great extent (analogous to a response being characterized as thick), with a greater proportion of others reflecting from the filter (analogous to a thin characterization). Each

participant's knowledge base is unique and valuable, but inevitably, the questions posed on interview day and aspects of analysis may not allow for their wealth to be fully appreciated.

Responses to Questions 1–10 in Overview

Appendix M summarizes the participants' responses to each question, in terms of the general styles of thin and thick responses, frequently made points, and aspects of response that particularly characterize Stage 6 participants. Further details concerning the characteristics of each stage will be explored in Chapter 7, which presents the horizontal analysis of the response data. Certain points are noted as being made by participants from only one or two of the three nations; the overall pattern that emerges by implication is that while slight national shadings of response do occur, they are minor in comparison to transnational response patterns. A more detailed comparative summary of response data is included in Chapter 7. The following additional summary table highlights particular questions for which, within a national cohort of a particular job role, such as Canadian teachers, all responses actually offered are thick. That is, while in some cases no response was offered, there are no thin responses for that particular role/nation cohort. As may be seen from Table 10 below, the additional pattern presented reveals another aspect of certain questions: that they typically provoked thicker responses from participants within a particular cohort, or in some cases (such as Question 3) multiple cohorts. Although the numbers for the Swedish educators are small, with two individuals in each of the teacher and administrator cohorts, the size of the other cohorts are significantly larger, with seven Canadian teachers, seven Lithuanian teachers, and five Lithuanian administrators. Responding with a similar response style in these cases then becomes something of note, particularly Q3 of the connection strand of questions, where the responses for all Lithuanian teachers and Lithuanian administrators were thick.

Table 10***Questions for which All Responses are Thick within Role/Nation***

Question	Canadian Teachers	Lithuanian Teachers	Lithuanian Administrators	Swedish Teachers	Swedish Administrators
Connection:					
2		✓		✓	
3		✓	✓		✓
4			✓		
5			✓		
Engagement:					
8			✓		
9	✓				

Subtheme Analysis of Responses to Questions 1–10

This chapter details trends of subthemes emerging from each of the ten questions sequentially. These subthemes, besides their innate interpretive value, illustrate the difference between thick and thin responses. In a later chapter, further trends are then elucidated by combining the questions by strand of interpretation, connection or engagement, as well as by grouping all ten questions together, with a discussion of emerging patterns. For this analysis every participant's statements are made use of with as even as possible a distribution among schools, roles, stages, and nations of participants, as shown in Tables U1 and U2 of Appendix U. Four participants are represented by slightly fewer quotes as they were either Stage 1 (LT-Care) with all thin responses, or the non-staged designation of 'Stage 0' (CA-Admin2, LT-Admin1, LT-Teach4) with incomplete data sets. The use of 'Stage 0' in the tables of the appendices does not indicate lower than Stage 1, but rather that these participants were non-staged, due to professional or personal demands requiring them to curtail their interview. Some stages or participants appear to a greater extent, but this relates to the size of the data set. For instance, out of the 26 staged participants with one or more thick quotes, nine are in Stage 5. For each individual in Stage 5 there is a larger pool of thick responses, where the average number of thick

responses in Stage 5 is almost eight, whereas for Stage 2 the average is approximately two thick responses for each participant.

Beyond differentiating thick and thin responses, the focus in this chapter includes subtheme trends within thick responses, which is core not only to the discussion for each question but also to the three strands of questions identified. In general, an increase in stage implies an increase in thick responses. In order to track subtheme trends in thick responses while ensuring fair representation of participants in the sampled quotes, selections of quotes for this purpose were made in such a way as to ensure that of all thick quotes available, averages of more than 50% per question and more than 50% per participant were used, as shown in Appendix U. The participants' thick responses coded for each question are highlighted in yellow in the ten tables in Appendix S, with a summary of the number of coded participants' responses used shown in Appendix U. As can be seen in the combined table for all ten questions (Appendix T, Table T4), all participants except for the single Stage 1 participant who had no thick responses were included in this analysis. The response style data discussed in this chapter can be found in Appendix V.

The following table indicates the number of responses based on 50 percent of the average number of thick responses per participant for that stage, with the data for this table being sourced from Table U1, Appendix U. The linear increase in thick responses with stage in the table is of note, obtained from the 161 different thick responses given among those 29 participants with one or more thick response. Of these, 84 were used in the coding analysis for subthemes, with 43 being used in this chapter as illustration of the vertical analysis of the top ten questions.

Table 11***Average Number of Thick Responses by Stage***

Stage	Average number of thick responses per participant	50% of average number^a
1	0.0	0
2	2.0	1
3	3.3	2
4	5.7	3
5	7.6	4
6	9.7	5

Note. ^aThis represents at least half of the average shown in the previous column.

For each question, the following guidelines were used when selecting quotes:

- participants from all three nations were represented as often as possible given the data available (seven out of the ten question discussions)
- each of the 29 participants having one or more thick responses was used (at least once and up to three times)
- between three and six quotes per question were selected to show the range of subthemes within thick responses
- all 28 subthemes are referred to, particularly the top ten subthemes (the selected quotes are shown in Appendix U, Tables U1 and U2, with green and purple highlighting indicating coded thick and thin responses used for illustration in this chapter). Although introduced in relation to each of the ten question discussions, the importance of these top ten subthemes will be outlined in a later chapter.

The remainder of this chapter is devoted to the ten interview questions, divided into the three question strands of interpretation (Q1), connection (Q2 through Q5), and engagement (Q6 through Q10), with thin and thick responses illustrated in each case. A number of key insights or ideas that emerged throughout Chapters 6, 7 and 8 will be recapitulated in summary Tables 15

and 16 in Chapter 9, thus gathering together the threads of program insights and of sustainability framework characteristics.

Interpretation Strand

The overall trend differentiating thick and thin responses for this question and strand is that thin responses tend to focus on one or two driving forces such as the importance of taking action, whereas thick responses integrate a sense of discernment among choices of action, where critical thinking skills are emphasized.

Q1, Interpretation: What does ‘education for sustainability’ mean to you?

For the interpretation strand, only one of the top ten questions was involved. Of the 28 subthemes mentioned across the ten questions, 17 arise with respect to Q1, with four being particular to this question and 13 common to other questions as well (see Appendix X). Thin responses for this question have one or two subthemes, whereas the range for the number of subthemes in thick responses is from three to eight (see Appendix R), with data shown in Table S1 of Appendix S. The dominant subthemes for Q1 are ‘action’ and ‘choices’ for thick responses, with ‘action’ being referred to among various subthemes in thin responses as well.

Sample thin responses to Q1

‘Action’, a common subtheme, appears with the most frequency of any subtheme among thick responses for Q1. In fact, ‘action’ appears in thin responses to eight of the ten interview questions, barring Q2 and Q8. ‘Action’ could therefore be seen as a starting-point response for individuals engaging in the EcoSchools program. The following are samples of thin responses from three participants, one from each nation, representing the two of the roles of teacher and administrator. Four different subthemes are raised in the excerpts below. ‘Action’ is one of the two subthemes referred to in this Canadian participant’s thin response:

They are the ones that have to start it, so educating students and getting their participation is extremely important (CA-Teach2, p. 2).

Although the number of different subthemes raised acts as a primary indicator of a thin response, this quote illustrates a secondary characteristic: aspects of a subtheme may be incorporated rather less fully. For instance, the second subtheme arising in the quote above is that of ‘responsibility’. Here the subtheme manifests in emphasizing the responsibility of one group within the community, in this case students, rather than a shared sense of responsibility, arising in some of the thick responses: that is, of members of two or more groups collaborating together to share responsibility.

Out of the ten questions, six have particular subthemes associated with them: Q1 has four, Q4 has two, and Q2, Q6, Q8 and Q10 each have one particular subtheme. For participants with thick responses, of the four particular subthemes for Q1, each is mentioned two or three times. The following two thin responses illustrate the appearance of two of these particular subthemes, ‘three ESD spheres’ and ‘real life’. Both of these subthemes appear three times in the thick responses. In the case of each of these subthemes, two out of those three are Lithuanian participants, which might suggest an emphasis in this nation regarding both a way of defining ESD as well as engaging with it. The following Lithuanian participant makes reference to ‘three ESD spheres’ as follows:

Sustainable development means to teach everybody about how to preserve nature (LT-Admin4, p.1).

The traditional definition of ESD touches on the three spheres of economy, society and environment. As this participant’s focus is on one aspect, nature preservation, this quote also illustrates the characteristic of thin responses referring to one aspect of a more complex subtheme.

As a particular subtheme, ‘real life’ appears only in connection with Q1, but the way in which it is brought into the discussion in the different contexts of Chapters 6, 7, and 8 illustrates the way these three chapters work together to illuminate the data. ‘Real life’ is illustrated in the context of a thin response relating to what SV-Admin1 stated below, which is used in Chapter 7 to illustrate this participant’s interpretation strand in the Stage 2 portraits. However, it also appears in the context of a thick response in the section immediately following, as found in the response shared by LT-Teach4. Additionally, the manner in which SV-Admin2 touches on ‘real life’ is brought to the fore in Chapter 8 in the context of the discussion of the dynamic view. This shows how even one particular (i.e., single-question) subtheme is contextualized in a variety of ways in the analyses of Chapters 6, 7 and 8. The realm of focus for the following Swedish administrator is driven by the students attending his school, which are those with special educational needs, a feature that is apparent through his use of the particular subtheme ‘real life’.

And for me, it’s about having a practical way to work with sustainability in schools, in everyday life (SV-Admin1, p. 1).

This Swedish administrator’s focus is also on the school unit, rather than the school as it is embedded within a larger community of parents and families or members of local government who might collaborate with the school.

Sample thick responses to Q1

The responses with the greatest variety of subthemes for Q1 include six to eight subthemes for each person, including two particular subthemes in each case, as shown through the comments of CA-Coord, CA-Teach3 and LT-Teach6 (see Table S1, Appendix S). Illustrating the individual nature of responses, of the 13 different subthemes referred to by these three participants, six are mentioned by only one participant, six are mentioned by two participants, and one subtheme, ‘action’, is mentioned by all three. Of the subthemes mentioned by two of the participants, in three instances these were by CA-Coord and LT-Teach6, once by

LT-Teach6 and CA-Teach3, and twice by the two Canadian educators, CA-Coord and CA-Teach3. Although only marginal, there may be a suggestion even with such a small comparative sample of a commonality of style of these thick responses between CA-Coord and LT-Teach6. In fact, both participants are Stage 6 and are part of the sample of participants included in more detailed horizontal analysis of stage characteristics in Chapter 7.

Both CA-Coord and LT-Teach6 make reference to ‘three ESD spheres’ while maintaining an emphasis on the environmental sphere. The following quote from LT-Teach6 illustrates a thick response for Q1:

ESD means ecological, economic, and social development – balancing it. Balanced ESD nowadays is a new view in Lithuania. We’ve had ecological education before, but now have a deeper view of it, a deeper knowledge. Now looking at our daily activities and how they harm nature. Be an example to her [school] children, to her family. If you can influence children when they are young, maybe not in this time, but maybe later in their lives, they will return to it, to nature. Necessary not only to talk with children, but to do something: show them how to do it for self (LT-Teach6, p. 1).

In going beyond the three strands of ESD, the aggregate of subthemes in this response is around the subtheme of ‘action’ and includes ‘leadership’, ‘time’, ‘patience’, ‘independence’, ‘daily activities’ and ‘balance’. ‘Independence’ is a subtheme that is associated with the deep view discussed in Chapter 8 and since it only appears in the higher stages (4–6) it can be seen as an indicator not only of a thick response, but of higher stage participants. These describe the style of action required, in that a sense of independence is needed for individuals as they act, and that individuals show leadership and have the patience to express it even if the results do not appear when they are present to bear witness to them in the short term.

The following quote from CA-Coord also has an emphasis on the type of ‘action’ needed while engaging with ESD, as well as touching on the common subthemes of ‘leadership’,

‘imperfect’ and ‘time’ as well as two particular subthemes of ‘three ESD spheres’ and ‘appropriate scale of action’:

Understanding and seeing the world through the three lenses of environment, economy, society. Be given the skills to make changes in the world, in our own circle of influence, to whatever extent we can. By doing that we will more sustainably lengthen the life of the world and the possibilities of it. I think it’s for all people, but it has the most effect with the younger kids; they are more open to it – the older people just don’t want to, they can just refuse to, or they’ve lived so long through one economic time (CA-Coord, p. 26).

The participant links these subthemes in suggesting that action associated with a particular skill set is required by individuals showing leadership within their circle of influence in order to improve the life of the world so that it might endure over a long period of time. There is an emphasis of the environmental strand of ESD as well as an acknowledgement that some action is required, even if it is imperfect or incomplete.

The subthemes mentioned by the Canadian teacher in the following quote also aggregate around ‘action’ and, while some subthemes common to the previous two educators are referred to, this teacher touches on a few different subthemes, specifically ‘appropriate scale of action’, ‘choices’, ‘consequences’ and ‘interconnections’.

I think we try to do that ecosystem approach: that everything affects everything else. So they’re never going to make perfect choices, but.... Every time they do something, to stop and ask themselves, “What are going to be the consequences of this”.... And sometimes it’s just bringing awareness to it – do you leave your tap running when you brush your teeth? Certainly in the senior grades, we’re looking more on a global scale. If you’re wasting water, how does this compare to some of the countries in Africa, where you had to walk for an hour to get your water, what would you be doing. So I think in the junior grades it’s more their individual actions, and in the senior grades, it’s more looking at a global scale (CA-Teach3, p. 1).

The idea of choices suggests an emphasis on developing discernment among different actions available, each with different consequences within an interconnected system. In the arena of sustainability, associated with complex information and systems, discernment and the development of critical thinking skills are particularly important. After ‘action’, ‘choices’ is the dominant subtheme for this question and the interpretation strand, and is a defining quality of the wide view, one of the four views, detailed in Chapter 8. Another characteristic of the subtheme ‘choices’ is that it appears exclusively in the higher stage participants (Stages 4–6).

The following excerpt also illustrates a thick response. This Lithuanian teacher also touches on the subtheme of ‘choices’ in the context of the subthemes of ‘citizen’, taking ‘action’, and ‘real life’.

Integrate all subjects into development; subjects must be connected with our true life, our real life (LT-Teach4, p. 3).

The significance of the pairing of ‘citizen’ and ‘real life’ is that this participant is making reference to ESD moving beyond school curriculum infusion, towards shaping a framework the individual may use in life generally. The true environmental impact of a school and a measure of a school’s success will be determined by the type of citizens their students turn out to be.

Connection Strand

The overall trend differentiating thick and thin responses for this strand of questions is that thin responses tend to focus on what action might be taken in the present time and place, whereas thick responses reveal a broader sense of understanding and connection with the environment in non-proximal time and space, as well as leadership regarding the environment. A point to note regarding connection strand responses, as shown in Table 10 above, is that all Lithuanian teachers who provided a response to Q2 and Q3 provided a thick response (or ‘no response’). For Q2, all seven Lithuanian teachers provided a thick response; for Q3, five

Lithuanian teachers provided a thick response, while two provided no response (see Table N2, Appendix N). Given that the Lithuanian teacher cohort consists of seven individuals, this reflects a significant level of consistency of response, suggesting that all of these teachers are clear about what brought them to the field of ESD and also about their connection to nature. The cohort size for the Lithuanian administrators is slightly smaller (five individuals in total), and yet all these participants provided a thick response (or a ‘no response’) to four of the ten interview questions; three of these were within the connection strand (Q3, Q4, Q5) and one in the engagement strand (Q8) (see Table N2, Appendix N). This finding may suggest a more cohesive style of response for Lithuanian administrators, particularly for the connection strand.

Q2, Connection: What was it that first brought you to issues of sustainability?

For the connection strand, there were four questions involved, with the data for Q2 shown in Table S2 of Appendix S and the collated data for the connection strand in Table T2 of Appendix T. Although Q1 had the largest number of subthemes (17) associated with it, Q2 and Q5 also have 16 subthemes each. Both of these questions are in the connection strand and both include common and particular subthemes. The range of the number of subthemes for thick responses for Q2 is from three to nine, with thin responses referring to one subtheme (see Appendix R).

Sample thin responses to Q2

The subtheme ‘multiple impetus’ describes the situation where there were two or more driving forces behind participants’ engagement with ESD. This subtheme featured prominently in the thick responses of the connection strand overall, and was secondary only to ‘time’ for Q2 in frequency of use. For each of the following three thin responses, ‘multiple impetus’ was in fact the only subtheme mentioned and it was referred to in a less complete way, in that each person seemed engaged for one primary reason, rather than multiple ones. For instance, this Canadian teacher’s initial impetus was financial:

Probably an odd way I got into it too was just money and happenstance – not driving. Wherever I live and wherever I work, I didn't need a car. I think in some ways it grew out of necessity, because I didn't have a car, I couldn't afford it. That just kind of got my brain thinking that way – thinking ... environmental consciousness, environmental protection (CA-Teach6, p. 2).

The following Lithuanian administrator was also drawn to the field through one primary impetus, in this case professional duties:

Paying a lot of attention to preparing children to acquire a profession. Concept is not new, but in this form it is new (LT-Admin4, p. 1).

The following Swedish participant was brought to the field through one primary purpose, linking environmental consciousness to work with children:

I've always been interested in environmental issues. Been working with children for many years at Save the Children. I like to combine children with sustainability (SV-Coord, p. 10).

These three participants from the three nations reflecting three different job roles show that the subtheme of 'multiple impetus' was touched on by each of them, but with reference to one impetus. This contrasts with the thick responses, which show a larger variety of reasons drawing the participant to the field.

Sample thick responses to Q2

In illustrating the range of thick responses, each of the following participants representing all three nations comes to the field of ESD through personal reasons or a variety of reasons, reflected in the subthemes of 'personal' and 'multiple impetus'. After 'time', these are two of the most frequently referenced subthemes for this question. The variety of reasons seen in the selected quotes include the influence of family members or property, culture, academic background, one person such as a particular teacher, or professional duties.

‘Time’ is the most frequently occurring subtheme for both Q2 (nine times) and for the connection strand overall (20 times). Each of the nine participants with thick responses coded for this question address the common subtheme of ‘time’. The participants include individuals from all three nations in the roles of coordinator, administrator and teacher. They touch on different aspects such as the long period of time over which their interests in ESD developed, their sense of time moving into the future, that they are working for generations to come, such as their own grandchildren, or supporting their students’ lives beyond their schooling years. Two other questions, Q8 (‘multiple barriers/drivers’) and Q10 (‘action’, ‘integration’), have one or more subthemes mentioned by each of the coded participants. Such consistent use of subthemes relating to an interview question is one example of how the structure or architecture of a response reveals its content. In the case of Q2 and the use of ‘time’, a heightened awareness of time appears linked, almost as a draw, for individuals to the issues of sustainability. ‘Time’ does appear in the context of other questions, where participants may touch on this subtheme, but in the context of having to take action in the present moment. The subtheme of ‘time’, then, covers all three dimensions of past, present and future for both the self and others.

The common subtheme of ‘topophilia’ only appears in responses to two questions, Q2 and Q3 (both in the connection strand), but appears multiple times in these questions. After ‘time’, the subtheme of ‘topophilia’ is the most frequently mentioned defining subtheme of the connection strand. The following Canadian teacher makes direct reference to ‘topophilia’, while also touching on ‘multiple impetus’, the ‘personal’ nature of her developing interests and the long ‘time’ period over which her involvement in ESD has been fostered.

I think it was the big wave of Earth Day resurgence in 1990. I was a student in high school ... the issues were treated seriously by the high school I attended.... We were speaking earlier about topophilia and learning about the environment through your family, having the experience of being in the woods or being at the farm. And I was really lucky, I always considered what I had – one foot in the

city, one foot in the country. So that was just having come from the type of family I've come from.... We still go harvest food off the land, and we have that connection. I still fish. I know where my food comes from.... So that was luckily thanks to my family, so it would have been the people that influenced me in my early life (CA-Teach1, p. 3).

Expressing the connection of an individual to the waters and land of their nation is key in this strand of questions and an indicator of a thick response for Q2.

Both the Canadian teacher quoted above and the following Lithuanian administrator touch on the subtheme of 'interconnections'. Here this administrator addresses 'interconnections' in conjunction with 'balance' and 'action' as well as 'time' and 'leadership':

As a physics teacher, an individual is part of nature. If individual lives according to nature's law, then nature will help them to live. If not, then they both suffer. Also care about individual as part of nature. Want children to live in a safer, healthier environment – our main goal (LT-Admin1, p. 24). Wanted to influence students in saving our environment (LT-Admin1, p. 26).

In the above passages, both individuals refer to humans being a part of nature, dependent upon nature for our lives. At other points participants express the 'interconnections' subtheme as a sense of wonder at the complexity of the web of life and our place within an interconnected system.

The subtheme of 'leadership' is also touched on by this participant in his reference to his desire to influence students in saving our environment. After 'action' and 'time', the common subtheme of 'leadership' is the only subtheme that appears in every connection strand question and is also the fourth most frequently referenced subtheme across all ten questions, after 'action', 'time' and 'responsibility'. As another example of response architecture revealing content, the significance of the appearance of 'topophilia' and 'leadership' is that participants' responses point to the important conjunction of connecting to the environment while at the same time

exhibiting leadership qualities to do something about the state of affairs both for themselves and also by engendering these qualities in the students in their care. Participants, such as those selected in Q1, touch on the subtheme of ‘leadership’ by emphasizing themselves in the role of leader for their children and family, for their students, and for others in their circle of influence. Whether it relates to the self or others, this subtheme suggests the leaders will blaze the trail in creating a liveable future. ‘Leadership’ is often referred to in conjunction with ‘time’, in that the positive influence will be apparent only over a long period, and also points to the subthemes of ‘imperfect’ in that opportunities to act should be taken no matter how small, ‘responsibility’ in the duty of care to be a leader, or ‘one person’, emphasizing that we can each make a difference.

A related aspect of interconnected systems is that every action affects other components within a system. To quote Hungarian systems scientist Béla Bánáthy, “Central to systems inquiry is the concept of SYSTEM. In the most general sense, system means a configuration of parts connected and joined together by a web of relationships ... a family of relationships among the members acting as a whole” (Bánáthy, 1997, n.p.). This concept relates to the subtheme of ‘consequences’, which often appears in conjunction with other subthemes such as ‘responsibility’, ‘choices’ and ‘thinking’, as with the following Canadian teacher.

I guess in high school I never really thought about it a lot, other than my cultural background tends to make me frugal. My family comes from India, and they recycle, or sell, or re-use everything.... It becomes almost sacrilegious to throw something out ... which we do all the time, because that’s the culture here.... But then in university, in teachers’ college, I had [this particular] teacher, and I took [his] environmental course ... and I found that I agreed with a lot of the ways that he thought about things. And the idea that you can change society, even if you’re just one person. I think as teachers we have a responsibility – and also a bigger effect than we know.... Because we have the kids, and we talk to them about things and they have a chance to kind of ruminate – and I think if you hit them long enough and hard enough, and they can see that it’s valid – and show them

the differences between one life-style and another ... not make the choice for them, just show them the opportunity to make the choice... (CA-Teach5, p. 1).

This excerpt also clearly refers to the subthemes of ‘personal’ and ‘one person’ in discussing our ability to effect positive change. Looking ahead for a moment, after ‘action’ and ‘responsibility’, the most often repeated subthemes for the engagement strand of questions, ‘one person’ is the only other subtheme mentioned in every question of the strand. ‘One person’ is an indicator not only of a thick response, but also of a higher-stage participant as ‘one person’ is associated only with Stages 4 through 6 responses. This common subtheme appears (as shown in the horizontal analysis of Chapter 7) in higher-stage responses. Although not every higher stage participant makes reference to them in the taped interview, no participant from Stages 1 through 3 references ‘one person’.

In the quote above, this Canadian teacher also makes reference to the common subthemes of ‘thinking’ and ‘independence’ and serves as another example of response architecture revealing content. Although these two subthemes are not often paired in the same quote, in this instance they serve to clarify the necessity of an individual’s thinking changing towards a functional system independent of instructions from a particular teacher, book, or program in supporting an enduring change of behaviours. This change (key to the dynamic view, as will be developed in Chapter 8) needs to be encouraged rather than forced and may take place over an extended period of time, as suggested by this teacher. The perception that such a change is of value is one of several captured under the particular grouping of sovereignty in Table 16 (see Chapter 9), which presents various characteristics of a sustainability chef. The characteristics presented in this table represent a range from those acquired early in the process of becoming a sustainability chef, to those (such as a full appreciation of sovereignty, as CA-Teach5 expresses here, with the phrase “not make the choice for them, just show them the opportunity to make the

choice”) present only in later-stage participants with more fully developed sustainability perspectives.

The following two participants both make reference to the subthemes of ‘action’, ‘time’, and ‘personal’, while commenting on the importance of nurturing nature. The Swedish teacher SV-Teach1 had one thick response among the ten questions illustrated here. Brief as his comments are, the significance of making reference to ‘time’ and ‘action’ at the same time as commenting about nature is that this quote exhibits emerging characteristics of what may be referred to as the long view, to be discussed in detail in Chapter 8.

It is because he is now a grandfather ... with a two-year-old grandson, and he wants a clean world for him (SV-Teach1, p. 2).

This teacher is clear that things need to be done in the present moment to protect the world and its inhabitants in the future, and this sense of time extending into the future is a characteristic quality of a thick response for this question. The following Lithuanian teacher has similar elements in her response:

As a grandmother; nature is a part of my body (LT-Teach1, p. 1). As a biologist, she knows that people are making pollution and are not paying attention to the environment. And she understood that something should be done for this (LT-Teach1, p. 2).

Here the subtheme of ‘multiple impetus’, including family and academic fields, drew her to ESD. Both SV-Teach1 and LT-Teach1 refer to a smaller number of subthemes in their responses, with 3 or 4 respectively, as compared with CA-Teach5 illustrated above, who made reference to 9 subthemes relating to this question. Also, SV-Teach1 and LT-Teach1 are both in Stage 2, and represent the full range of thick responses in the stage, with one and three thick responses respectively across the top ten questions. With six thick responses in total, CA-Teach5 is in Stage 5. However, among the nine Stage 5 participants, there is a range from six to nine

thick responses across the top ten questions, as shown in Appendix U and discussed in the next chapter in more detail.

Q3, Connection (Book Excerpt): How is it that ... we have not created utopia?

The full text of Q3 used in the case study nations can be found in Appendices H and I, while the data for this question are shown in Table S3 of Appendix S. Q3 has the modal (most frequently occurring) number of subthemes associated with an individual question, which is nine (the other questions with this number of subthemes are Q4, Q7, Q8, and Q10, as shown in Appendix R). For Q3, only common subthemes are present. The range of the number of subthemes for thick responses is from two to four, with thin responses referring to one subtheme. A point to note regarding Q3 is that of the four views (to be outlined in Chapter 8), only those subthemes regarding the long view, which is associated with the connection strand, are present. Those subthemes associated with the wide, deep and dynamic views are absent from the thick responses to Q3. The only other question associated exclusively with a single view is Q6, which relates to the stated goals of the EcoSchools program and relates solely to the deep view. Thick responses associated with Q3 often touch on ‘topophilia’, ‘time’ and ‘interconnections’ as participants share their reflections regarding themselves, their connection with nature and their part or the part they could play within the web of life.

Sample thin responses to Q3

Thin responses for Q3 were rare since Q3 had the largest number of thick responses of the top ten questions, with 20 staged participants having a thick response. The subtheme that both of the following Canadian participants refer to, although in a rather marginal way, is ‘action’.

I mean, it’s a nice sentiment, but it’s not going anywhere (CA-Teach5, p. 6).

For CA-Teach5 the projection technique in Q3 from the book *The Earth Remains* does not link to action in the here and now in forwarding the ESD agenda.

Nice sentiment, but it's like a poem.... I think to a large extent, that gets back to Mazlov's hierarchy of needs. A lot of people just aren't in a position to ask themselves that question (CA-Teach6, p. 5).

Although there is a similar sense from this teacher, the emphasis is on pragmatism, rather than engaging with the philosophical motivations supporting action many others spoke of. One aspect of having to interview participants with their colleagues is observable here. CA-Teach 5 and CA-Teach 6 were interviewed together, and the distinctive phrase "nice sentiment" was mentioned by both, one as an echo of the other, although due to the order in which they responded to this question, CA-Teach6 actually made use of it first. What their responses might have been if the interview could have been completed individually is unknowable. While similarities in response style might have been detectable under different conditions, the influence of the presence of a colleague is certainly detectable in this instance. This is an example of how challenges arising in the practice of research are sometimes more difficult to address in the moment than any theoretical counterpart.

Sample thick responses to Q3

The subtheme referred to most frequently is 'topophilia' for Q3. Out of the five participants selected to illustrate thick responses here, four mention this subtheme, which provides a strong current through the responses in the connection strand of questions. The following teacher links 'topophilia' to 'citizen' through her sense of being a Canadian:

I think it's part of who I am as being a Canadian. So I can't speak for others, but I know for me it's a fundamental part of who I am and my connection with the land. Growing up as a camper, as a canoe-tripper, a person at a cottage ... being tied to the land is part of my Canadian identity.... I can say is what I've read from students from Hong Kong. To them, they just don't see themselves as part

of it at all, at this point – they might later. And if I think back, I think it was the same way for me, until I was in my late teens (CA-Teach4, p. 6).

Here she also touches on the subtheme of ‘time’, in that her connection to the natural world developed over a period of time in the past and she recognizes that her students may be in the midst of a process at present, shaping them in time to come. For CA-Admin1, the present aspect of ‘time’ is emphasized:

This is all that we have, right? The here and now, and for effecting change.... To get the best possible life for yourself, if you were thinking purely selfishly, you would have to do something about the environment. If you have a streak of altruism in yourself, and you’re thinking about others, you still have to do something for the environment. Really, that’s all that people can be doing (CA-Admin1, p. 6).

Seizing the present moment to effect change, rather than procrastinating or relying on blind optimism, is essential in her view. She also touches on the subtheme of ‘values’, when stating that altruism and self-interest can both lead to taking positive action with respect to the environment.

Although the previous and following participants are in Stages 5 and 2 respectively, CA-Admin1 and CA-Teach7 both responded to Q3 in similar styles, touching on the subthemes of ‘interconnections’ in conjunction with ‘action’. For CA-Teach7 these two subthemes are linked to ‘topophilia’ and ‘personal’, as shown below:

We are very much a part of the Earth ... very much part of nature. I guess now it’s easy to feel isolated, it’s easy to feel alone, because of the technical age and the scientific era, but we ultimately ... I think anyone realizes that control over nature is not something we can achieve, that we can have. So we need to work with it, not against it, for our own benefit.... You know, I am a very religious person, I believe in God, I meditate, so I am very much into it. And I believe for our own goodness, for our own well-being we need to realize that.... I meditate in the backyard, now that the weather is good. After work, before I go to sleep,

yes, in the evening. And it helps me to see the trees, to see the wind blowing ... it just gives me that feeling that something beyond my control is out there. And I need to connect with it. It makes my connection with God, I would say, stronger, to nature stronger. And nature, in my mind is God. So spiritually, as well as physically, nature helps my mind, yes (CA-Teach7, p. 12). It's not a Canadian thing, it's a human characteristic, yes. I talk to my grandparents who are from India, who travel back and forth. And they're the same way. They don't know a word of English, and yet when we are outside and I want to close my eyes and take a deep breath, and connect ... she understands, my grandmother understands.... So it's not just a Canadian thing, it's not just an English thing, it's not the language, it's not the culture (CA-Teach7, p. 13).

This teacher touches on the web of life and its universal nature, her place within it, and her personal need to connect to it. Shared clearly here, these expressions are part of the long view, discussed in greater depth in Chapter 8. They also suggest the beginnings of systems thinking, a subset of sustainability chef characteristics captured in Chapter 9, Table 16.

The following Lithuanian teacher and Swedish administrator both touch on the subtheme of 'topophilia', but an emphasis for LT-Teach4, regarding our relationship with nature, is 'leadership'. In doing so, LT-Teach4 expresses both the subthemes associated with the long view.

She believes that everywhere it's the same – ultimately the Earth remains. If people forget about it, then they will get reminded. She thinks we are obliged to protect nature. She is very close to nature, lakes and forests, goes outside. The most important thing is the family – how the family gives the example of looking after nature (LT-Teach4, p. 4).

The style of leadership described here begins with the individual within the family unit, rather than action taken in isolation. The school here is nested within a community of families, with links to other entities such as government and business. In Lithuania more than the other two

nations, the family unit is mentioned as an important lever of change, with the responsibility for positive sustainability leadership branching beyond the usual educator-student dynamic.

While the following Swedish administrator comments on the subtheme of ‘topophilia’, he does so in conjunction with ‘consequences’ when considering ‘action’ and our ‘interconnections’ with each other and the Earth.

I think what you have read is a very philosophical way of expressing the connection between humanity and the Earth that we live on. In every day life I don’t think so much about that, but at the same time I think there’s awareness of this being really important.... It’s important to see the connection between what you do and your surroundings... (SV-Admin1, p. 4).

An important point here is the relationship between the interconnectedness of life and the consequences that follow an action, whether they have a positive or negative impact. By bringing a sense of awareness of these impacts, individuals might be motivated to act in a manner aligned with sustainability.

Q4, Connection (AQ2b): By what means might society progress in the 21st century, while ensuring generations to come inherit a living Earth?

The data for Q4 are shown in Table S4 of Appendix S. There are nine different subthemes in the responses to Q4, with ‘action’ appearing as a dominant subtheme in both thin and thick responses. Thick responses tend to reflect essential qualities of taking responsibility to act, revealing environmental leadership in the reflected choices. The range of the number of subthemes for thick responses is from two to four, with thin responses referring to one subtheme (Appendix R). Only common subthemes are referred to in this question.

Sample thin responses to Q4

For Q4, ‘action’ is the most frequently mentioned subtheme among thick responses. The following two thin responses also touch on the subtheme of ‘action’. With this Lithuanian

teacher, ‘action’ is referred to in a general sense of goals, rather than regarding specific achievements in the school:

We need to find alternative energy sources, and use the wind, sun energies, and less damage to the environment. Have less waste (LT-Teach5, p. 4).

On the other hand, this Swedish administrator touches on ‘action’ in the context of a stated goal that has been initiated but without success yet:

In the project we didn’t get all the money that we wanted – we wanted to be able to change all our cars – to change them to cars that used a different kind of fuel that would be more environmental (SV-Admin1, p. 4).

Across the top ten questions ‘action’ is the subtheme most frequently referred to and therefore plays a dominant role. It can, however, be taken in the sense of considering what action to take as well as describing what action has actually taken place.

The subtheme referred to by this Canadian teacher is ‘leadership’, used in the sense that a teacher has influence on those around them, particularly their students.

Yes, the real teachers need to be role models. Like I will not tell them to do something if I have not tried it myself, if I have not done it at home myself (CA-Teach7, p. 13).

Although the focus of influence is the educator-student dynamic, in this case the home or family unit is seen as an incubator for emerging actions and environmental leadership.

Sample thick responses to Q4

‘Action’, as the dominant subtheme for Q4, emerges with four out of the five participants chosen to illustrate thick responses. Of these, three also touch on ‘responsibility’ as they discuss protecting nature. The implication of the juxtaposition of these two subthemes is that it is an individual’s responsibility to take action regarding environmental solutions. In addition, LT-Admin3 also refers to ‘time’ as follows:

First of all, by protecting nature. Future generations can't survive with litter, devastation, weapons. Developed countries should pay attention to developing nations. Lithuania has a lot of experience protecting the environment. People should be told, educated, based on concrete examples (LT-Admin3, p. 4).

For LT-Admin3, the overlap of the three subthemes touches on a duty of care beyond self and known communities such as those found in schools, towards individuals never to be met because their lives are lived in a time or place too disparate. When considering a few subthemes together, one quality of a thick response style may be expressed in terms of the emerging views of participants, as described in Chapter 7 and further detailed in Chapter 8. Here, an understanding of the importance of moving beyond proximal time and space is emerging, which is a characteristic of the long view.

For both LT-Admin4 and SV-Care, 'responsibility' is referred to in conjunction with 'action'.

Should be an efficient distribution of natural resources at home and abroad.

Consider pollution of land; waste is an issue (LT-Admin4, p. 4).

In both the quote above and below, a wider sense of responsibility is touched on, moving beyond the normal remit of educators in schools. The administrator above suggests a linked responsibility between citizens of Lithuania and other nations, whereas the caretaker below suggests an extended duty of care beyond school to society. Both make reference to actions to be taken regarding both the use of resources and the production of waste as primary issues relating to creating a liveable future.

We have been working at the whole school level, to be engaged in.... Maybe we need to move more on the societal level – reduce the use of energy, reduce the emission from cars, and so on. But will it be enough? (SV-Care, p. 4).

The final comment relating to Q4 by SV-Care touches on the great uncertainty that individuals face when trying to make the best decision given the complex information regarding

sustainability. Other participants' responses also reflect the concept of uncertainty, but to a lesser extent than is revealed here. Whether uncertainty acts as a guide through the precautionary principle, or as a motivating force in pursuing sustainability is not clear, but it does manifest as an undercurrent in these discussions.

The three subthemes of 'leadership', 'time' and 'thinking' are touched on by LT-Teach2 in the quote below. Whereas 'time' is a key subtheme across all strands of questions (ranking most frequently used in the connection strand and second most frequently across all 10 questions overall), and 'leadership' is a key subtheme in the connection strand (being present in each of the four strand questions as well as ranking fourth most frequently used subtheme overall), 'thinking' is a key background subtheme to all three strands, ranking fifth most frequently used subtheme overall (see Table T4, Appendix T).

Education is very important but also important later on, when a person is an adult. Very important to teach them to think otherwise. She thinks the government also has to take responsibility for it (LT-Teach2, p. 2).

This Lithuanian teacher is the one participant among the five selected to illustrate thick responses for Q4 who does not touch on the subtheme of 'action', but rather focuses on changing individuals' thinking. This change may take place over a longer period of time and may even be a precursor to enduring change in behaviour or action. 'Thinking' is the characteristic subtheme for the dynamic view, which is outlined in itself and linked to the other views in Chapter 8.

The following administrator links 'action' with 'motivation'. Similarly to the Lithuanian teacher above, this Canadian is pointing to the fact that orientations have to change before action occurs.

Environmental literacy has to be completely incorporated into everything we do.... It has to become as second nature to us as having a shower in the morning, and you know, putting your trash out every once in a while. It just has to be

something we do, we are – it has to be something that we become (CA-Admin1, p. 7).

In her view, if an individual's motivation is completely informed by environmental literacy, then our actions will be aligned with this understanding. The link between these quotes is that environmental literacy, mentioned by the Canadian administrator as a basis for 'motivation', is an example of the different 'thinking' referred to by the Lithuanian teacher.

Q5, Connection (AQ2d): How would you characterize the role of motivation (understanding the seriousness of a problem) versus hopefulness (feeling able to do something about it) in developing a liveable future?

The subthemes data for Q5 may be found in Table S5 of Appendix S. After Q1 with 17 different subthemes, Q2 and Q5 rank with the second most varied set of subthemes, as both questions have 16 common and particular subthemes each. The range of subthemes referred to in thick responses for this question is three to seven, with one subtheme being referred to in thin responses (see Appendix R). 'Thinking' and 'time' are the most frequently referred to subthemes for this question. This is significant as it is the only instance where 'thinking' ranks within the top two most frequent subthemes for a question, so strongly characterizing responses here. As 'thinking' is the subtheme associated with the dynamic view, the importance of this view in shaping individuals' actions and their sustainability profile is made more apparent through these excerpts.

Sample thin responses to Q5

Thin responses were rare in relation to Q5, as this question garnered the largest number of 'no responses' within both Canadian and Swedish participants, and the second-largest 'no response' cohort among Lithuanian participants (see Appendix N). As touched on in the Chapter 4 "Interviews" section, Q5 (AQ2d) was a question introduced in the revised interview schedule, one that perhaps would have benefited from revision, if time had allowed. As stated earlier, the

intention for including this question was to unpack the question of motivation through revealing participants' operationalization of the Kübler-Ross grief cycle, as it pertains to sustainability.

Both of the participants included here lightly touch on the subtheme of 'action'. For the following Canadian teacher, a primary goal is to keep things simple for her students:

I would say, keeping it simple, first of all ... keeping it simple, keeping it real, and relating it to their lives ... here in Canada (CA-Teach7, p. 11).

For this Lithuanian caretaker, the main goal is to focus action on nature protection:

Teach pupils to save our nature. He's optimistic (LT-Care, p. 3).

For both of these participants the primary individuals they are engaging with are the students.

Sample thick responses to Q5

For Q5, the most frequently referenced subthemes are 'thinking' and 'time'. Three of the four participants selected for illustration here include the common subtheme of 'time' in their responses, with two of those (LT-Teach5 and CA-Teach5) touching on 'thinking' as well.

Young people don't automatically believe in this. Students do the projects not out of hope that life would be better, but so that they would take part in the camp.

Our moral duties go behind us through our work (LT-Teach5, p. 5).

The Lithuanian teacher above contrasts the experience of students and teachers. Students' thinking, her response suggests, needs to shift over a period of time, while their present engagement in the program might be motivated by a desire for fun. For teachers, on the other hand, the subtheme of 'motivation' appears in connection with 'values', or moral duties. The following Canadian teacher also touches on 'time' and 'thinking':

And you're not going to get them to change everything – the boys still like fast cars.... But you get them thinking about it. Maybe you won't see the change now ... and maybe you won't ever see the change yourself, but at some point in time, it might click in for them (CA-Teach5, p. 4).

This participant comments on the fact that change happens over a long period of time and is preceded by a change in thinking. Her response also covers the ‘imperfect’ subtheme in that incremental change is still progress. In addition, a subtheme relating to ‘time’ and the ‘nature of change’ (a particular subtheme for Q5) is ‘patience’, in that individuals may not bear witness to the change in others they may have instigated due to the long time frames involved. This excerpt is another example of response architecture revealing meaning.

The following Lithuanian teacher also touches on the ‘nature of change’:

We say for our school children that they should separate waste, but we haven’t the conditions to do that because not important for government. We should bring up that generation who will teach their children how to do it. Feels school doesn’t have enough influence on students. Most important influence is the family; they will grow up to be parents who will teach their children by example (LT-Teach7, p. 4).

This participant comments on the fact that change can happen either top-down or, as is the case here, bottom-up. This school has understood the need for recycling, has changed individuals’ behaviour, and yet there is no municipal system to collect the recyclables. Other members of this school team describe the manner in which they have engaged companies to pick up the recyclables, thereby creating their own local program. In these comments this teacher also addresses ‘time’, ‘responsibility’ and ‘leadership’. She points out that the change involved takes place across generations, with responsibility and leadership shared beyond the school community to include the family and the government.

In eliciting change, particularly with her students, the following Swedish teacher maintains the importance of presenting ‘concrete examples’ of solutions with a sense of ‘balance’ to the problems that we face in shaping a sustainable future.

If you just talk about the problems all the time, then they think that we can’t do anything. But then you have to tell them that some times you get results.... That

we can work together and make a difference.... Because I think otherwise you just feel, “Oh, I don’t know anything ... what will change if I don’t take the car. I can take the car because millions of others are” (SV-Teach2, p. 13).

Without the sense of balance between problems and solutions that have been shown to work, individuals may lose their sense of hope and be overcome by uncertainty, doubt, or fear brought on by understanding the seriousness of problems faced. As her response suggests, the belief that ‘one person’ can make a difference is maintained in conditions of hope. As an undercurrent to these three subthemes, a sense of collaboration can also be detected: working together will more effectively bring about positive change than working in isolation. This statement by SV-Teach2 is another example of response architecture revealing content.

Engagement Strand

The overall trend differentiating thick and thin responses for this strand of questions is that thin responses interpret the focus of the program being that of a club, the primary goal being recycling. Thick responses reflect a school-wide program seen as an opportunity to shape individuals (responsibility, motivation, independence) and interact with the broader community.

Q6, Engagement (AQ3a): How would you characterize the goals of the EcoSchools program?

Five questions fall under the engagement strand, beginning with Q6. As Appendix U indicates, the pool of thick responses is larger for eight of the ten questions; the responses for Q6 and Q10 garnered fewer thick responses, as indicated under the heading of “Total T resp.” at the bottom of Tables U1 and U2. Seven different common and particular subthemes were mentioned in Q6, where thick responses included three or four subthemes, and thin responses included one subtheme (see Appendix R). Table S6 of Appendix S shows the data for Q6, with the collated data for the engagement strand shown in Table T3 of Appendix T. A point to note regarding Q6 responses is that the thick responses touched on subthemes associated with the

deep view, associated with the engagement strand, and did not include subthemes associated with the long, wide or dynamic views. The only other question that included subthemes associated exclusively with one view was Q3.

Sample thin responses to Q6

The most frequent subthemes appearing in thick responses are ‘environmental literacy’, ‘action’, and ‘responsibility’, which in some cases were used in conjunction, suggesting that part of environmental literacy may involve a responsibility to act. The one subtheme touched on in thin responses was ‘action’, addressed by each of the following three participants from the three nations. This Canadian teacher comments on a number of actions, including curriculum development as EcoSchools goals:

There are three prongs: waste minimization, energy conservation – actually four – and green space, and curriculum (CA-Teach6, p. 7).

The following Lithuanian administrator also touches on action required to support healthy living:

Healthy way of living (LT-Admin4, p. 5).

Finally, the focus of the following Swedish teacher is on action to be taken supporting both environmental work and the functioning of the club.

The main goal of the program, I think, is to initiate environmental work and to continue with it.... But then also to get this environmental club to work (SV-Teach2, p. 14).

In all three cases the focus of the sphere of action appears to be within the school itself.

Sample thick responses to Q6

Among the participants with thick responses, the most prominent subthemes mentioned are the particular subtheme of ‘environmental literacy’ as well as ‘action’ and ‘responsibility’.

The Lithuanian coordinator touches on all of these subthemes as well as ‘citizen’:

Educate students about the environment. Show how to care about it, provide means to do so. To educate citizens who will take care of environment, as much as possible. How to influence society democratically, if you want to take care of the environment (LT-Coord, p. 37).

The coordinator moves beyond the focus of students or even schools, towards a sense of larger roles and shared responsibility. At the core, however, is an understanding of the world based on environmental literacy. For LT-Admin2, ‘environmental literacy’ manifests in conjunction with ‘time’ and ‘citizen’ in the following way:

A broad education. Research, comparing results with other schools. To look more widely to ecological problems now. We’re training citizens who are aware of such ecological problems (LT-Admin2, p. 9).

The sense of time moving into the future appears in this administrator’s reference to training citizens, in that the knowledge acquired in the present moment will support them in the future.

The Swedish coordinator’s emphasis on ‘environmental literacy’ guiding ‘action’ occurs alongside ‘independence’:

The goal is to give schools the chance to organize their work around environmental questions and issues for sustainable development. To bring democratic aspects into their culture, to take action with students. To take action (SV-Coord, p. 15).

This participant makes reference to democratic aspects, interpreted here in terms of the ‘independence’ subtheme, in the sense that the students would have sufficient knowledge that they might determine for themselves the actions they would like to take and the manner in which this might be achieved. Aspects of whole-school involvement and empowerment such as this are among the insights into sustainability learning programs collected in Table 15 (see Chapter 9). The result represents a reflection of the school community at that time, rather than an imposed program reflecting the priorities of a few individuals.

The following Lithuanian teacher also addresses the subtheme of ‘independence’:

Main purpose is to have a strong relationship with our society. Improve students, parents, foresters. Participants, the children, would be able to suggest how to solve these problems by themselves (LT-Teach3, p. 9).

The idea that students would be able to solve problems by themselves, independently of the priorities of adults, is a significant point for Q6 and an illustration of a key subtheme in the engagement strand of questions. Within the strand of questions, ‘independence’ ranks jointly, along with ‘motivation’, as the fourth most frequently used subtheme: across the top ten questions, ‘independence’ ranks fifth jointly along with ‘thinking’. In the quote above, LT-Teach3 also touches on the subthemes of ‘action’ and ‘responsibility’, where the responsibility for action is shared beyond the immediate school community to wider society, including foresters.

Q7, Engagement (AQ3c Part A): Describe some of your biggest successes.

The data for Q7 may be found in Table S7 of Appendix S. A total of nine common subthemes were involved in Q7. Three to five subthemes are referred to in thick responses for this question, with one or two subthemes being referred to in thin responses (see Appendix R). Among thick responses of individuals touching on both ‘action’ and ‘responsibility’, the two most frequently cited subthemes, three participants also touched on ‘motivation’, which suggestively points to the intertwining of a sense of responsibility and personal motivation shaping the action taken. Thin responses also include ‘action’ as a subtheme.

Sample thin responses to Q7

Almost all of the participants with thick responses for Q7 mention the subtheme of ‘action’, which is the most frequently referenced subtheme for this question as well as for the engagement strand as a whole. Each of the following three participants exhibits a thin response that also touches on ‘action’.

In lessons, improved understanding (LT-Teach2, p. 4).

The type of action referred to by LT-Teach2 falls under the primary duties of teachers, whereas the focus for SV-Coord is about the initial act for schools to engage with the program, as shown below:

Program is popular since there are a lot of new schools. In 2005 had 157 new pre-schools send in an application (SV-Coord, p. 16).

The following Canadian teacher links ‘action’ with the subtheme of ‘time’ as follows:

It was in my 9 applied class, actually, where we talked about the use of resources in our school – do we waste resources, or do we use them in smart ways. And they said yes, because of [the school environmental action club]! And that wouldn’t have been the answer I would have received four years ago... (CA-Teach4, p. 11).

While the primary focus of this excerpt is recycling and the activities of the school environmental action club, this teacher makes reference to change now apparent that has taken place over a period of time.

Sample thick responses to Q7

The six participants used to illustrate thick responses for Q7 reference the four subthemes that are significant for the engagement strand: ‘responsibility’, ‘motivation’, ‘independence’ and ‘one person’. Three of these participants address ‘responsibility’ and ‘motivation’, in conjunction with ‘action’.

First, you have to want to do this. Then look for ways on how to do this. Important to spread results to society, town and wider amount of people (LT-Admin1, p. 19). Search for experience in other schools, or through literature research: how to get this Green Flag. The main thing is that there should be a group of people who wish to do this work, because nobody pays you for this. Get agreement of society (LT-Admin1, p. 20).

This Lithuanian administrator underscores the fundamental reality that motivation cannot be coerced: an individual or group of people have to want to engage with sustainability.

Responsibility here is shared beyond the school community, extending to society, with a sense of collaboration in effecting action.

The following excerpt from LT-Coord also touches on these three subthemes, and in a similar manner:

Involvement of all parties: director, teachers, students. If involved, program flourishes. Involvement of local community, especially municipal ecologists with local authority *sinunai* [workers]. Communication is number one importance, to have in-person meetings. Doing real things; not just reports, write articles. Celebrate together as implement program (LT-Coord, p. 21). One of the biggest successes is in villages where talking about energy efficiency – because of the efforts of the school: the villagers are changing light bulbs to energy saving bulbs (LT-Coord, p. 38).

Here the emphasis is on collaboration and a shared sense of responsibility by the various players both within the school and beyond that community. The type of action described relates to real things to effect change, rather than describing what or how things might be done. Celebrating with the community throughout the various implementation stages helps motivate individuals. Here the Lithuanian coordinator was also stating the importance for the national coordinator to make site visits, have in-person meetings and develop ties of strong communication.

For SV-Admin2, the same three subthemes of ‘responsibility’, ‘motivation’ and ‘action’ are mentioned in the following excerpt:

Now we have got – we shall shock the public community, with 25% organic food – that’s the goal. The school, for the school canteen – that 25% would be organic. They want them to shop for local food.... And it’s more expensive. The Swedish food is very expensive; [organic food is] more like 30–40% more expensive (SV-Admin2, p. 2). [Achieving our goals], we can’t do it alone (SV-Admin2, p. 3).

Motivation is required to achieve the common goal stated in the school community of a large percentage of local, organic food in the school canteen. The responsibility for the goal is shared among different members of the school community such as students, teachers, staff and outside suppliers. A sense of collaboration among these players is needed, particularly given the final statement by the participant of needing a team effort to successfully achieve the goal.

The following Canadian teacher touches on two of the key engagement strand subthemes, ‘responsibility’ and ‘one person’, as well as ‘action’ and ‘time’:

A Cherokee friend of mine, they’re using an ancient strain of blue corn seed and I was given about ten individual kernels, so right now we’re just trying to grow more, and then hopefully save that seed and distribute it to seed banks. But, in the face of terminator seeds and genetic modification.... And it’s the small things that people may not understand what they can do or understand even what we’re doing, that can make a difference. Saving a species of plant for food purposes for our future generations is paramount right now. And as Vandana Shiva was saying in *The Corporation*, this is sustaining life.... My project was to create a unit, a curriculum ... to use the greenhouse ... and five years later, you saw the greenhouse. We have experiments, we’re using it for curriculum, we have other teachers in the school using it ... other schools using it. And it really amazes me. I open that door and I see it just filled with plants and experiments and students coming in, and you know, genuinely taking care of the greenhouse (CA-Teach1, p. 9).

In the excerpt above, ‘time’ has multiple perspectives: action in the present moment, into the past given that some goals have taken five years to develop, and into the future in two ways: so that generations to come may benefit, and also in terms of the apparent ongoing sustainability of the greenhouse initiative, now taken up by other teachers and even other schools. It is a hallmark of an enterprise’s sustainability that it may outlast the involvement of those who initiated it, a point also raised by CA-Coord in an engagement strand excerpt in the next chapter (Stage 6 portrait) and incorporated in Table 15 (Chapter 9) as an indicator of program sustainability.

There is an emphasis on the acts of one person bringing about change, even if they are poorly understood or thought to be inconsequential by others. There is a suggestion that those individuals who can act have a responsibility to act, as well as to collaborate with others within and beyond this school.

One theme that both CA-Admin2 and LT-Teach6 touch on is ‘independence’. The following Canadian administrator makes reference to this subtheme as well as ‘action’, ‘time’ and ‘leadership’:

And [the students] started coming to me and they’d poke their head in the door and they’d say, “You’re going to turn that off before you go home tonight?” And I mean, they’ve just grown so much, and the stuff they want to do now ... it’s just phenomenal (CA-Admin2, p. 4).

Here a group of students engaged with the school’s environmental club communicate with the senior administrator of the school to check that action was taken to reduce the phantom load of the school. They are acting independently of others and exhibiting a style of environmental leadership. Behaviour, for both the students and the administrator, has evidently changed over a period of time. This administrator exhibits a characteristic that arises in the responses of administrators in the other case study nations, such as SV-Admin1 and LT-Admin3, of appreciating and praising the work of the staff and/or students in their school.

In the following excerpt, LT-Teach6 touches on the subtheme of ‘leadership’ as it relates to students and staff in her school as well.

Students have won local, national, international awards from their work on projects. The best thing was that we all came together into one place and we decided what we should do (LT-Teach 6, p. 7).

A sense of collaboration is apparent in the suggestion that the best thing they did was gathering and deciding on common goals, itself touching on the subtheme of ‘motivation’. The subthemes of ‘leadership’ and ‘thinking’ make an appearance in this excerpt as well. ‘Thinking’ is

exhibited by the common understanding required in the goal-setting for the school community, as well as a strong level of thinking exhibited by those students able to win awards at various levels within and beyond Lithuania.

Q8, Engagement (AQ3c Part B): Describe some of your biggest challenges, and how you surmounted them.

The data for Q8 may be found in Table S8 of Appendix S. A total of nine subthemes were involved, including both common and particular subthemes. Two to six subthemes are referred to in thick responses for this question, with one subtheme being referenced in thin responses (see Appendix R). Each participant with thick responses to Q8 touched on the particular subtheme of ‘multiple barriers/drivers’, which is a strong indication of the consistency of their responses. This holds across the three nations and for the roles of both teacher and administrator, indicating a grasp of the complexities of both the problems and solutions regarding the EcoSchools program implementation. All Lithuanian administrators who provided a response did so in a thick response style (see Table 10, earlier in this chapter). Uniquely in the engagement strand of questions, Q8 responses did not have the subtheme ‘action’ appearing in the first or second most frequently cited subthemes. Rather, ‘multiple barriers/drivers’ and ‘time’ ranked first and second, possibly suggesting that a more complex portfolio of skills were involved in surmounting challenges rather than only taking action.

Sample thin responses to Q8

Two of the following participants, LT-Teach7 and SV-Teach1, address aspects of the ‘multiple barriers/drivers’ subtheme in their thin responses.

Should involve more teachers. Not only small group of teachers in work of EcoSchools. Being short of money. If you want to organize something, you need money. Solution is to take part in projects to get money; children and their parents donate (LT-Teach7, p. 6).

The barriers of small numbers of involved teachers and a shortage of money are referred to by this Lithuanian teacher. An idea to ameliorate the financial issue is offered, but no driver to the program is mentioned. The following Swedish teacher also refers to a barrier:

But the burning of the waste in Uppsala ... it was too complicated.... They were seeing a power plant, and it was very abstract, very hard to understand (SV-Teach1, p. 7).

In this case, the barrier is the gap between the students' ability to understand and the information at hand, with no solution to bridging the gap apparently available.

The subtheme touched on by both of the following participants is 'motivation'. For CA-Teach7, the issue is around motivating the students beyond the sense that their primary role is that of garbage-pickers.

Again, number one challenge is to keep the kids motivated – it is difficult when they feel they are the cleaners, the garbage-pickers, and not more than that (CA-Teach7, p. 15).

No solution to the motivation problem was mentioned. In the following excerpt, LT-Teach5 touches on problems as well as solutions to motivational issues:

Pupils are passive and want more entertainment rather than work. Need to keep looking for different forms of work and have shorter projects. Try to find a balance between work and entertainment (LT-Teach5, p. 7).

The onus of this proposed solution is on the teacher to make efforts to find appropriate types of interesting projects of fairly short duration.

Sample thick responses to Q8

Each of the three participants used for illustration purposes here, CA-Teach3, SV-Teach2, and LT-Admin5, respond in terms of the particular subtheme of 'multiple barriers/drivers'. Two of them also touch on 'time' as an additional subtheme, as shown in the comments of the following Canadian teacher:

I think our kids are really great but the leaders are also on the SAC [Students' Administrative Council]. The kids are really busy, so there's a limit to how much you can ask them to do.... The bulk of our executive isn't here right now because they're with the concert band at the national championships at Ottawa! (CA-Teach3, p. 11).

The situation faced by this teacher is one of an insufficiency of engaged students available to be consistently active in the program. At present those students involved are also involved to a great extent in other co-curricular programs. Being engaged with the school's environmental action club takes time, a limiting commodity for these students.

The following Lithuanian administrator also touches on 'multiple barriers/drivers':

We take part in projects, but we face problems, like for example we have a big amount of plastic, but we can't recycle it. It is very difficult to show to children what is the use of it. Now have containers that are picked up in the school for recycling. Now there is a service that people can bring out their waste. Some years ago, we didn't have containers for our waste. Four or five years ago. And it was very hard work to teach people of our village to bring their waste to the container; there were some meetings about this, and the school was involved, to explain why, and because it's important, how it's useful. And this is a very big achievement (LT-Admin5, p. 11).... [Before that, waste went] to the forest, on the top.... But this system of separating waste [for recycling] in Lithuania doesn't take place now (LT-Admin5, p. 12). We have a big problem with selling our plastic bottles. Because there are no companies who can buy it – buy it at all! If you want to bring it, you should give them money; you pay them.... But our society is involved with it too, because children bring it from home. And when we brought the plastic bottles to school, the children went to each house to ask if they had any bottles. (LT-Admin5, p. 14).

This administrator weaves the subthemes of 'multiple drivers/barriers' together with those of 'time', and 'responsibility' in describing the difficulties around implementing a recycling program in the school for paper as well as for plastic. She outlines the long time frames

involved, the multiple players extending beyond the school community with a role, the behaviour change within the village regarding basic waste collection as well as recyclables, and finally the involvement (or otherwise) of external businesses.

For SV-Teach2, the subthemes of ‘multiple barriers/drivers’ and ‘responsibility’ are also touched on, but in conjunction with ‘independence’ and ‘leadership’, as shown below:

Often they have some problems with that [goal of 25% organic food in the canteen], because we haven’t so many local food supplies, because the students want something.... [And] it’s quite expensive, organic food, in Sweden. They have this as a goal, but one of the big things that is difficult to buy is milk for schools. Because students drink a lot of milk, so one of the most important things is to get organic milk. And we have organic milk, but not in these big containers.... It’s a very practical problem. But you have to have those big containers.... The problem is that the milk supplier [Arla] won’t.... It’s a larger [company] – national ... it’s international even. Now [our town] community has talked about this, and if we go together with other schools, and demand this big milk container, we can do it (SV-Teach2, p. 2).

The goal of obtaining organic milk for the school canteen’s large milk dispenser machines is described as emanating from the students themselves, independently of adult input. The solution to the problem primarily rests with the dairy company, with the hope that the company would be able to provide organic milk in the larger, reusable, containers. This would then solve both problems: the supply of an organic product and the waste associated with its container. The responsibility to bring about change is seen to be shared among this school, other schools, the town community and external businesses. The style of leadership is both collaborative and assertive, given that the participant uses the word ‘demand’ in relation to bringing about their goal of changed organic milk containers.

Q9, Engagement (AQ4a): What are your own (and the school's) goals for your school in going beyond certification?

The only instance where all six of the Canadian teachers who provided a thick response (one teacher provided ‘no response’) is for Q9 (see Table 10, earlier in the chapter). Part of the reason for the consistency of responses among Canadian teachers might point to the arguably more circumscribed focus of the program, as discussed in the “Case Selection” section of Chapter 4: curriculum issues are not touched on and an environmental audit is not required at the outset. Even so, the fact is that Canadian teachers seem consistently aware of the goals of the program, its limitations, and their priorities in moving beyond certification. The data for Q9 may be found in Table S9 of Appendix S, which indicates that a few of the educators’ responses reflected a sense of responsibility to act. A total of 12 common subthemes were involved. The range of subthemes referred to in thick responses for this question is three to five, with one subtheme being referred to in thin responses (see Appendix R).

Sample thin responses to Q9

The most frequently mentioned subthemes were ‘action’ and ‘responsibility’ in thick responses for Q9. Among the four participants illustrating thin responses below, ‘action’ is touched on by three, and ‘responsibility’ by one. Here CA-Admin1 describes the actions she would like to be taking at school:

Well, I’d like to be more environmentally aware myself.... I’m a little ashamed at how little I am doing. I’m doing a lot in my house, but we could be doing a lot more at school (CA-Admin1, p. 13).

The following Lithuanian teacher emphasizes the importance of continuing with actions prescribed from the EcoSchools goals:

All the time, we have to be in this cycle [the EcoSchool poster steps] (LT-Teach2, p. 5).

For LT-Care, his goal of keeping the flag is dependent on taking action and the quality of the work undertaken for the EcoSchools program:

We have to work as we work now, and even better. He wants to keep the flag (LT-Care, p. 5).

On the other hand, for SV-Admin2, the focus shifts from ‘action’ to ‘responsibility’ as shown below:

It depends very much on the pupils who are coming here (SV-Admin2, p. 15).

Here this Swedish administrator underscores the fact that the EcoSchools program relies on various players for its functioning, with one of the key categories of player, students, varying unpredictably.

Sample thick responses to Q9

Three out of the following four participants illustrating thick responses touch on the subtheme of ‘action’. Participants also share other dominant subthemes for Q9 of ‘responsibility’ or ‘independence’, key subthemes for the engagement strand. The Canadian coordinator addresses these three subthemes as well as ‘thinking’ and ‘one person’ in this excerpt:

That every person in the school is thinking about sustainability, and is showing it through their action, and is able to articulate their understanding of it. But it’s got to go beyond that ... it moves beyond, to the families, to the community (CA-Coord, p. 55).

This participant’s response suggests that a shift in thinking about sustainability, a characteristic of the dynamic view, is required before a change towards sustainable action can take place. The sharing of responsibility is among every member of the school community as well as the larger communities it is nested within. The following Lithuanian administrator also touches on ‘action’ and ‘independence’, but additionally covers ‘motivation’ in this excerpt:

Need to keep up standard. Main goal isn't to keep the Green Flag, it is to develop our work. Concentrate on research and look for reasons why these things are happening. Work should be based on theoretical facts and practical activities (LT-Admin2, p. 11).

Here the role of motivation is larger than the ordinary goals of maintaining a standard of action within the EcoSchools program; it is to develop their own sustainability work independently of the program, yet aligned with it. CA-Teach2 shares the subthemes of 'action' and 'responsibility' with CA-Coord, but also implies 'leadership' in the following excerpt:

Actually, I think that my next step would be to bring this type of awareness of the program to society. We all have a small society available to us as relatives (CA-Teach2, p. 13).

This participant underscores our responsibility to be leaders within our circle of influence in bringing about change for a sustainable future. Seeing the individual as embedded in various communities, and therefore a hub of change, represents an insight into program effectiveness, captured under "Change: the ripple effect" in Table 15 of Chapter 9.

CA-Teach5 references five subthemes, of which one, 'leadership' is shared by one of the above participants.

I enjoy travelling to places, and looking to see what else is going on ... trying to incorporate it, bring stuff back to the school.... I was in Vietnam a couple of years ago. I visited the Mekong delta.... And I found it interesting that there were no birds, or there were very few birds, and I was wondering if it had a lot to do with the Agent Orange that was there. The birds you did see were never around the cities ... there were one or two areas that had kind of been protected, so you saw some birds there. But in forests of Vietnam, it should have been wall-to-wall birds, it should have been birds everywhere, but there's silence in the sky – nothing. So I figured it had to do with some kind of contamination.... There was nothing (CA-Teach5, p. 12). When I was hiking in Nepal, what bothered me was the consumerism. Because as a tourist, people were demanding things like a

bottle of Coke. And they didn't have the plastic bottles, they had the real bottles. And you'd see these men going up the hill with a tump line on their neck, and maybe four or five cases of Coke, up the hill.... So it was just the consumerism aspect of it... (CA-Teach5, p. 13).

In recounting some of her travels, this teacher reveals her interest in going beyond seeking best practices, observing the 'interconnections' between action and results even across continents and over a period of time. In this excerpt, 'leadership' is also touched on, particularly with respect to her own 'actions' not just in visiting foreign lands to gain an insider's view into some sustainability issues, but also in bringing a quality of awareness of these first-hand experiences back to her students within and beyond in-class lessons. The 'consequences' of having certain values and the negative or positive environmental impact is also apparent.

Q10, Engagement (AQ4c/d): Which of the goals that you have met do you think would be part of your school program even without the EcoSchools program? Which of your goals has arisen because of the EcoSchools program?

The data for Q10 may be found in Table S10 of Appendix S. A total of nine common and particular subthemes were involved in Q10. The range of common and particular subthemes referred to in thick responses for this question is three to five, with one or two subthemes being referred to in thin responses (see Appendix R). Each participant with thick responses, including individuals from all three nations, in the roles of coordinator and teacher, touch on the subthemes of 'action' and 'integration' in their responses to Q10. This consistency suggests a commonality of approach regarding the implementation of a school-wide sustainability program, which would entail both action and the integration of sustainability principles across the school.

Sample thin responses to Q10

Each of the following four participants, illustrating the style of thin responses, also touches on 'action'. For CA-Teach7, taking action to reduce basic environmental impact is important:

But now with EcoSchools, recycling is a huge part; energy conservation – turning off the monitors – that’s come about because of EcoSchools. Unplugging the TV so that the phantom load is reduced... (CA-Teach7, p. 17).

For LT-Admin2, the actions and priorities regarding the program are set by individual schools:

Every school has their own vision (LT-Admin2, p. 12).

For LT-Teach2, the primary action taken is associating knowledge of the environment across the school curriculum:

When we think about this in this specific school, eco-education is integrated in every subject (LT-Teach2, p. 5).

For SV-Teach1, the subtheme of ‘motivation’ is also touched on as follows:

Every day we work a little.... The basic, the fundamental thing is our own interest or love of the subject, for the environment. But we’ve also had a lot of help and influence from the person working in the educational area, in the environmental area in the city (SV-Teach1, p. 12). One step at a time, yes (SV-Teach1, p. 13).

Taking even small steps towards a sustainability goal is important, but this Swedish teacher underscores the point that an individual’s internal motivation is the strongest guide towards sustainability.

Sample thick responses to Q10

In responses to Q10, the following four participants most frequently reference the subthemes of ‘action’ and ‘integration’, with each of them touching on both of these subthemes. An additional point of commonality is that SV-Teach2 and CA-Coord both imply ‘responsibility’.

I think we have some kinds of environmental goals from the laws of the school, the school law, and you have lots of goals from the community too.... And this general section science course. So I think a lot of things could be without the flag.... And I think they should be, should have done it, too (SV-Teach2, p. 17).

For the Swedish teacher above, ‘responsibility’ is linked to a sense that ‘integration’ through a holistic approach supports sustainability. Additionally, this teacher touches on ‘motivation’, in that actions taken in the school and beyond should also be done, regardless of the guidelines of the EcoSchools program and therefore not mandated by it. The following excerpt from CA-Coord shares the subthemes of ‘action’, ‘responsibility’ and ‘integration’ with SV-Teach2, but also brings in ‘thinking’ and ‘interconnections’.

The systems thinking I told you about before – which really values the whole multi-ocular view of multistakeholder perspective.... Jay Forrester talked about systems thinking as a way of thinking, and learning, and managing, and problem-solving.... It’s not just viewing the world in a certain way, but that has to be manifested through how your organization works. The reason that you have good teaching practice, small group work ... why? Because it reflects the interconnectedness of things (CA-Coord, p. 57).

A holistic view such as systems thinking is associated with sustainability and harmonizes with a sense of ‘integration’ as well as the quality of ‘thinking’ required, infused with the understanding of the ‘interconnections’ among things. Also, ‘action’ is taken by all players in the community as a shared ‘responsibility’. Required change is then evidenced in the way that the organization, for instance a school, would work. The Lithuanian coordinator also touches on ‘integration’ as he refers to the school as an entity needing to pursue sustainability in an integrated sense:

If school is sustainable, that is most important – not what we do, but how we do it. EcoSchools program just gives means for school to be more and more sustainable (LT-Coord, p. 53).

Beyond the subthemes of ‘action’ and ‘integration’ is the subtheme of ‘imperfect’, an undercurrent in this excerpt. Focus on the process of a school engaging with the EcoSchools program rather than a particular product is significant in that it leads in a positive direction, towards a sustainable future.

Beyond ‘action’ and ‘integration’, in the following excerpt, CA-Teach6 touches on two of the top ten most frequently referenced subthemes overall, namely ‘leadership’ and ‘one person’.

We certainly would have ourselves, and everyone in the school community, be mindful of their ecological footprint and do what they can to lower it. Even before we were an EcoSchool we were an environmental school, so as far as practices for EcoSchools, we were already doing.... EcoSchools just gave us a couple of specific things to strive for (CA-Teach6, p. 9). I kind of like the program that was put together on waste minimization, where we collect the compost scraps from the cafeteria, and put them in the compost. I’m glad we got that going ... [putting] composters on the school property with worms (CA-Teach6, p. 10).

Here, emphasis is on the fact that ‘one person’ can make a difference and it is expected that they would show that ‘leadership’ in the school, by lowering their ecological footprint. Although the organic waste minimization is emphasized here, by touching on the ecological footprint, this participant is referring to the subtheme of ‘integration’, intimating the many ways the footprint might be reduced.

Conclusion

With close observation, some overall trends are apparent even with the fragmentation of the above 75 quotes reflecting the responses of all of the 30 participants in this study. A primary trend is the shifting perspective of individuals given different understanding and conditioning: why individuals do the sustainability program they are engaged in, how they do it, and what is accomplished because of it; in other words, their motivation, their actions, and the ensuing results shift. Taken separately, as the pattern of individual question responses shifts from ‘thin’ to ‘thick’, characteristic views emerge based on the subthemes apparent.

The subtheme used with a frequency singular to the interpretation strand is ‘choices’.

This subtheme is suggestive of the importance of the development of a sense of discernment, or critical thinking skills given the breadth of variety of information and choices available. In the connection strand, the subthemes of special importance are ‘time’, ‘topophilia’ and ‘leadership’. In conjunction, these subthemes underscore the links between the self, the environment and the importance of understanding the vast potential extent of our circle of influence as it moves beyond proximal time or place. In the engagement strand, the subthemes of special importance are ‘responsibility’, ‘motivation’, ‘independence’ and ‘one person’. Taken together, these subthemes suggest the depth of an individual’s sovereignty to act, or to interact with broader community. Backgrounding these three views is the dynamic quality associated with the subtheme of ‘thinking’. These emerging subthemes are apparent independently of nation, school, or job role and are discussed as participants’ views. Further evidence for the views and a more complete discussion of them and their implications will be presented in the next two chapters.

Chapter 7:

Horizontal Analysis of Data

Introduction

The purpose of this chapter is to compare participants' responses in the five stages (2–6) that include one or more thick responses through a form of portraiture. The portraits make use of word maps and interview quotations, to reveal both what the participants stated and how they did so in the interviews. Of the original 30 participants, 26 meet these criteria, with four excluded due to lack of relevant data (LT-Care, CA-Admin2, LT-Admin1, LT-Teach4). While it was not possible to include the voices of these four participants in this chapter, they were included in Chapters 6 and 8 to a great extent. As shown in Appendix U, the range of the number of thick responses for each of these 26 participants is between 1 and 10. About half of the total available thick responses were included in the detailed coding, discussed in Chapter 6, with the selected responses highlighted in blue or green in Appendix U. Those 16 participants involved in the horizontal analysis portraits for this chapter were chosen through as even as possible a distribution of participants by stage, role, school and nation; these are shown through yellow highlighting in Appendix U. Among these 16 participants, there are 10 individuals representing five pairs of colleagues, educators working at a particular school. Although colleagues may not have responses to the same questions used for illustration, their overall style of response allows some degree of comparison within a school.

Participant Portraits

A summary of the subthemes for the participants' portraits in this chapter can be found in Appendix W. The summary for the use of all subthemes by question, which contributed to the analysis for the four views that emerge from the vertical and horizontal analyses, is presented in Appendix X. For the 16 participants, each of the questions highlighted in Appendix U (in blue

or green) were used to create the word maps. For example, Table U1 allows the following type of comparison: LT-Admin1 (no yellow highlighting, but three questions highlighted, with two green and one blue) with CA-Teach1 (with yellow highlighting, along with four highlighted questions, where two are green and two are blue) shows that while both participants had coded responses that went into the background analysis of subthemes (the sum of blue and green highlighted questions) discussed in Chapter 5, and both were used to illustrate various questions in Chapter 6 (the green highlights), only CA-Teach1 was used to illustrate the stages in Chapter 7, with all four coded (highlighted) responses used in creating this participant's word map for Stage 5. LT-Admin1, as it happens, could not be included in the stage portraits for Chapter 7 as this participant was non-staged (Stage 0 listed in Appendix U): he was obliged to curtail the interview due to professional demands. Both participants' responses, however, were used in the discussion of views in Chapter 8.

The word maps are used as a means of illustrating the style of a person's interview responses visually, and were created for each of these 16 participants to show the subthemes touched on by the participant for any given question. The horizontal analysis included in this chapter follows on from the vertical analysis of the previous chapter; it is informed by the data analysis previously discussed but is also augmented by additional quotes. As about half of the total thick responses were coded for Chapter 5, the number of questions included in word maps is decreased by half as well, thereby reducing their overall complexity while maintaining the ability to illustrate general style trends. The key point regarding the word maps has less to do with portraying the detailed structural analysis behind the vertical analysis and more to do with an alternative portrayal of the general trends in response styles among the five stages in the horizontal analysis.

Thick responses to an interview question are mapped within a response space, in most cases an ellipse, by noting the subthemes included. An increase in stage is associated with an

increase in the number of ellipses for each participant, since the number of thick responses increases with stage. Another trend is that an increase in stage is associated with an increase in the degree of connection between ellipses, a result of the repetition of key subthemes by the participant. A subtheme that is used in two questions is indicated by bold lettering within the overlap area of two ellipses; a repetition of a subtheme three or more times is indicated through the use of capital letters, often encircled in its own ellipsis, which is then linked to the relevant question ellipses by a straight line. These repeated subthemes stand out visually, providing a linked concept hub for a participant. Such hubs exclusively appear in the upper three stages (4, 5, 6), and include subthemes such as thinking, time, action, motivation, independence, responsibility, citizen and leadership, as indicated in Table 12 at the outset of the Stage 4 portraits later in this chapter. Almost all of these repeated subthemes raised in two or more thick responses are among the top ten most frequently used subthemes, but in addition they are important as primary means of informing participants' views, as will be outlined in the next chapter.

The word maps for the 16 selected participants in the horizontal analysis are juxtaposed to quotes from each of the three strands of questions: interpretation, connection and engagement. The quote selection is limited by the raw interview data since generally the Canadian participants' interviews were much shorter (half of one school day was available) than either of their Lithuanian (two school days) or Swedish (one school day) counterparts. Participants' responses are shown according to the strand rather than the question (as done in the preceding chapter) in order to gain a more holistic view of the response style, with the basis of quote selection being to best show a participant's responses within the strands. Some of the quotes were used to code or illustrate thick or thin responses in the preceding chapter, while other selections appear for the first time here in those cases where additional material was available. Together, the word maps and quotes provide portraits of participants in each of the five stages

which included one or more thick responses, juxtaposing a visual and textual sense of each participant as well as providing a manner of comparing both structure and content characteristics between the stages.

Stage 2 Portraits

The structure of the interview responses for the Stage 2 participants is similar to other participants in the four intermediate stages (2–5), in that they have a heterogeneous mixture of thick and thin responses. In Stage 2, the interpretation strand is thin, the connection strand is thin (mixed) and the engagement strand is thin (mixed). The difference between Stages 1 and 2 is that thick responses have begun to emerge in the connection and engagement strands, albeit with the thin responses remaining dominant in both cases. The emergence of thick responses in Stage 2 appears visually through the presence of a single ellipse in the participant's word map (representing the single *coded* thick response for each Stage 2 participant); the word maps associated with Stage 2 are the most straightforward kind (portraits for later stages involve multiple and often overlapping ellipses). Stage 2 responses have an increased articulation of a participant's motivation for work in the field of ESD, which generally begins with noticing that there are problems in the environment and that their own action might ameliorate the situation.

Three participants are used to illustrate Stage 2: CA-Teach2, LT-Teach1 and SV-Admin1. In all three cases, one question (either Q2 or Q3) from the connection strand is used for illustration, with four subthemes mentioned by each participant, represented in a single ellipse. Among all 29 participants involved in the vertical analysis of Chapter 6 who had one or more thick responses, the three most frequently appearing subthemes were 'time', 'action' and 'topophilia', as shown in Appendix T, Table T2, outlining the subthemes addressed in the connection strand. All of these subthemes are touched on among the Stage 2 participants, in conjunction with other subthemes, as shown in their word maps. These subthemes coalesce into

the basis for the long view, detailed in the next chapter, yet this view emerges at the outset of the appearance of participants' thick responses even in Stage 2.

When considering all ten interview questions together with their 28 associated subthemes (see Appendix T, Table T4), half the subthemes are touched on by each person in the stage cohort portraits of this chapter, including nine of the top dozen subthemes (shown in Table 12) and five of the remaining 16 subthemes. For the Stage 2 cohort, the two subthemes that are touched on by each of the participants in their word maps or excerpts are 'action' and 'personal'.

The word map for CA-Teach7 below illustrates this participant's response to Q3, which brought out four subthemes, discussed both in the preceding chapter and in the associated connection strand comments to follow.

Figure 8. Relationship of subthemes for CA-Teach7.

The following three quotes illustrate CA-Teach7's responses regarding each of the three strands of questions, beginning with the interpretation strand. The emphasis for this participant is on one aspect of the three spheres of ESD, the environmental sphere, as first illustrated here in the more in-depth analysis of this chapter:

So this education for sustainability again is 'awareness' for kids. Becoming aware of environmental issues, the need to plant more trees, the need for cleaner air... (CA-Teach7, p. 9).

The subtheme associated with the three spheres of ESD is a particular subtheme associated with this question, which this participant touches on at the same time as touching on the need to take

specific action such as planting trees, and to find solutions to difficult environmental problems such as air pollution.

The substance of the following quote, illustrating the connection strand for this participant, is shown in the word map above encircling four subthemes ('interconnections', 'topophilia', 'personal' and 'action').

We are very much a part of the Earth ... very much part of nature. I guess now it's easy to feel isolated, it's easy to feel alone, because of the technical age and the scientific era, but we ultimately ... I think anyone realizes that control over nature is not something we can achieve, that we can have. So we need to work with it, not against it, for our own benefit.... I meditate in the backyard.... After work, before I go to sleep, yes, in the evening. And it helps me to see the trees, to see the wind blowing ... it just gives me that feeling that something beyond my control is out there. And I need to connect with it.... It's not just a Canadian thing, it's not just an English thing, it's not the language, it's not the culture (CA-Teach7, p. 12).

These four subthemes are also the most frequently used within the connection strand for all participants, as shown in Appendix T, Table T2, and most of them play an additional role of informing the long view of participants, detailed in the next chapter. Together these subthemes reflect the very personal nature of this participant's connection with the Earth, her understanding of the interconnectedness of life, and her intentions behind actions taken regarding the Earth.

Beyond the subthemes that were common to other participants, in this excerpt CA-Teach7 gives voice to the difficulties around ESD work and how isolated one can feel. Although she does not offer the solution in the quote at the same point as the stated problem, the sense is that the solution to feeling isolated begins with connecting with nature, being aware of the interconnections within nature, and acknowledging her place within the web of life. The very interconnections of nature are then a reminder to connect with others, finding solutions and taking actions regarding the environment in a manner that reflects the way nature operates. Part

of this excerpt touches on the spiritual qualities of connection with nature and an acknowledgement of a power greater than ourselves, one that is beyond our control. Further, this participant characterizes the need and ability to connect with nature as being beyond common cultural labels, suggesting it to be innately available to humans.

In the excerpt below illustrating the engagement strand, CA-Teach7 makes reference to examples of actions taken to improve the local environment.

And our seasonal clean-up ... we clean the school grounds. Twice a year – autumn and spring. Twice a year we do a “community clean-up” – we call it, because we don’t just go into the school, we go into the plaza across from the school. Challenges? Again, number one challenge is to keep the kids motivated – it is difficult when they feel they are the cleaners, the garbage-pickers, and not more than that. To keep them on board, to keep them excited, to keep them enthusiastic about what they are doing. That is the biggest challenge. Because they then have to get the other kids on board (CA-Teach7, p. 15).

The subtheme of ‘action’ is juxtaposed to and first illustrated in this chapter with the subthemes of ‘motivation’ and ‘responsibility’. Together these three subthemes speak to what, why and how environmental action is taken at this school. In this statement, there appears to be a shared sense of responsibility beyond the staff and students of the school, moving towards their surrounding community. The subtheme of ‘responsibility’ in this instance is not just responsibility *for*, but also responsibility *to* something larger than might normally be considered within the remit of a school, as students clean up beyond school grounds. The subtheme of ‘motivation’ reflects CA-Teach7’s primary challenge, the motivation of those students directly involved with the EcoSchools project, yet it also suggests that the problem of motivating the rest of the student body is intimately linked to the level of excitement and motivation felt and expressed by the EcoSchools students. This is but one of the ways in which those students actively engaged in the EcoSchools program are essential to its functioning.

The word map for the following Lithuanian teacher is similar to the Canadian teacher mentioned above. Here, there is a single ellipse with the four subthemes mentioned by LT-Teach1 in response to Q2, discussed in greater detail in the preceding chapter as well as in the connection strand discussion below.

Figure 9. Relationship of subthemes for LT-Teach1.

In the following quote relating to the interpretation strand, this participant's focus appears to be around actions having a positive impact on the environment:

Education changes people's behaviour, for example, with recycling (LT-Teach1, p. 7).

The emphasis for LT-Teach1 is on the link between knowledge and action, possibly based on the understanding that individuals appropriately exposed to environmental issues may behave accordingly. 'Action' is the most frequently touched on subtheme in the interpretation strand, yet the subtheme with the next highest frequency is 'choices'. The significance of these two subthemes taken together is the suggestion that individuals choose actions given various options, with awareness of the available options being virtually as important as the actions taken. In the statement above, there appears a rather more linear presentation of the link between education and positive action with respect to the environment.

Nature protection is at the core of the excerpt for the connection strand for LT-Teach1, as illustrated in the word map above and exhibited in the following quote:

As a grandmother; nature is a part of my body (LT-Teach1, p. 1). As a biologist, she knows that people are making pollution and are not paying attention to the environment. And she understood that something should be done for this (LT-Teach1, p. 2).

As with some other Lithuanian participants, the full intention is difficult to gather from this excerpt, due to some degree to the limits of the translation available. Considering the words together with the body language, gestures and tone of voice shared in the interview, however, the first sentence takes on greater meaning. For instance, the deeply personal relationship to environmental issues is revealed by making reference to the generations of her family and the fact that nature is part of her very being. The molecules that comprise the environment also make up our bodies. As Canadian scientist David Suzuki frequently points out, we are our environment. This sentence also reveals that her actions in the present are at least in some degree to protect the children to come and so it also touches on the concept of future time. The excerpt ends by underscoring the participant's pragmatic approach: take action, since action is needed.

First illustrated here for this participant in the excerpt below, relating to the engagement strand, is a sense of responsibility while taking leadership:

In 2003 and 2004, organized two-hour school conference: "Know Nature and Love It", with pupils, teachers, administrators, environmental representatives from municipality, mayor. In 2005, water ecosystem project, members of nature club and 7 schools out of 12 in [this city] (LT-Teach1, p. 5). Pupils understand concept of democracy, without understanding the concept of responsibility (LT-Teach1, p. 22). Students don't understand environmental problems; they are indifferent (LT-Teach1, p. 23). Pupils are overloaded too – good pupils especially (LT-Teach1, p. 24).

The subtheme of 'responsibility' is significant in terms of both frequency of use and presence in each question in the engagement strand. Out of the 16 participants illustrated in this chapter,

only one teacher (LT-Teach5) and one administrator (SV-Admin1) do not touch on ‘responsibility’ in some form. Here, LT-Teach1 touches on both personal responsibility and a shared sense of responsibility within her community to engage with and take action with respect to the environment. The style of leadership revealed is one of collaborating with individuals in different roles both within and beyond the school. Finally, LT-Teach1 echoes a problem raised by other participants (such as CA-Teach3 in response to Q8 discussed in Chapter 6) in that the good pupils, particularly those essential students likely to fully engage with the EcoSchools program, are also likely to be the ones with heavy academic, athletic and other co-curricular demands.

The word map for the Swedish administrator, SV-Admin1, illustrates the four subthemes he touched on in Q3.

Figure 10. Relationship of subthemes for SV-Admin1.

Relating to the interpretation strand, this participant touched on the subthemes of ‘personal’ and ‘real life’, clarifying the relevance of sustainability to individuals in schools, as first illustrated here:

And for me, it’s about having a practical way to work with sustainability in schools, in everyday life (SV-Admin1, p. 1).

In the excerpt above, this administrator’s response reflects the nature of his school, which caters to special needs students who require a more practical, hands-on experience for learning. This is

also touched on in a comparable excerpt for the interpretation strand by his colleague, SV-Care, in the Stage 3 discussion.

The following quote relating to the connection strand is different from the quote used to code for the subthemes illustrated in the word map above. It raises here for the first time the subtheme of ‘multiple impetus’, given that both his previous career and a broader perspective inform his protection of the environment.

My background is that I am an environmental civil engineer, specializing in waste water engineering, so I have an interest. But on a more general level, I think it is fascinating and important... (SV-Admin1, p. 3).

His comments relating to the engagement strand echo the excerpt above, and centre on an individual’s interest as the primary motivator. First illustrated here is his use of the subtheme ‘motivation’:

But the fundamental thing was that we wanted to do it because we had an interest in it... (SV-Admin1, p. 12).

Other participants’ comments resonate with those made here, underscoring that a significant factor in the success of the EcoSchools program is that the schools willingly adopt the program, and those involved appear to have opted in due to their innate interest in environmental issues. The style and perhaps the success of the program might be considerably different if it were not primarily driven through such interest. Overall, SV-Admin1 outlines the reasons for his involvement in the EcoSchools program, centred on an interest in the issues, relevant skills and a willingness to take action related to the subject of sustainability, making efforts to create a relevant program for the members of this school community.

Aspects of Stage 2 are portrayed in the portraits of these three participants. The word maps, at the entry point of complexity, are made up of a single ellipse encircling the four subthemes touched on by each participant; these subthemes align with the most common

subthemes for the strand. The quotes illustrating each strand also reflect common subthemes touched on by other participants when considering all ten questions together. The overall emphasis of these participants is on the environmental sphere of ESD, along with chosen actions to improve the state of the environment.

Stage 3 Portraits

In Stage 3, the heterogeneous mixture of thick and thin responses follows a pattern in which the interpretation strand is thin, the connection strand is thick (mixed), and the engagement strand is thin (mixed). The difference between Stages 2 and 3 is that the thick responses have now become dominant in the connection strand, with a minority of thick responses in the engagement strand. The average number of thick responses per participant for Stage 2 was 2.0, whereas the average number of thick responses for Stage 3 is 3.3, with this increase reflected in the word maps by an additional ellipse. Stage 3 responses show more clearly a participant's connection with the environment as well as an understanding that other species and locations are affected by environmental issues within the sphere of their influence.

Two participants, LT-Admin3 and SV-Care, are used to illustrate aspects of Stage 3, including word maps with two ellipses representing Q3 and Q4 from the connection strand in both cases. There is an increase in subthemes, with five different subthemes touched on by each participant in total, as well as one subtheme repeated ('time', by LT-Admin3 in both Q3 and Q4), indicated by an overlap of ellipses with the subtheme indicated in bold. Although these trends are just emerging here at the first opportunity posed by comparing Stage 2 and 3, the trend of an increase in the number of thick responses, the increase in the number of subthemes used as well as the degree of their repetition continues with each succeeding increase in stage. In part due to the small number of participants in this stage cohort portrait, there are more subthemes

that both participants touch on in their word maps or excerpts, in this case six different ones: ‘action’, ‘responsibility’, ‘citizen’, ‘topophilia’, ‘time’ and ‘environmental literacy’.

In response to Q3 and Q4, LT-Admin3, touches on the most common subthemes for both of these questions as well as the connection strand itself (Appendix S, Tables S3 and S4; Appendix T, Table T2). More detailed discussion involving the Q4 subthemes in the word map below can be found in the preceding chapter as well as in the following connection strand discussion for this participant. Of the five different subthemes touched on by LT-Admin3, the figure below shows that three (‘citizen’, ‘time’ and ‘action’) are also raised by her Stage 4 colleague, LT-Teach5 (see Table T4, Appendix T). These two participants were interviewed separately, so the independent citing of these subthemes might suggest aspects of a guiding view within this school, LT-3.

Figure 11. Relationship of subthemes for LT-Admin3.

Note that, in the above figure, bold is used to indicate a subtheme shared over two questions, a technique used in other word maps; subthemes repeated three or more times are indicated by the use of capital letters.

This participant was absent for four (Q1, Q2, Q5, Q8) of the top ten questions due to professional demands on the interview day. As one of these questions encompasses the interpretation strand, there is no excerpt available for LT-Admin3 relating to this strand. As it was not possible to interview her for two out of the four connection strand questions, the word map above represents a complete view of her connection strand responses. The engagement

strand was the least affected by the limitations on her time, with only one out of the five questions not being asked in the interview.

The following is the substantive quote behind the word map for this participant, showing the codes for Q3 and Q4 illustrating five different subthemes, including one repeated subtheme, ‘time’. The three most frequently used subthemes within the connection strand, ‘action’, ‘time’ and ‘topophilia’, are manifested. Aspects of this excerpt are characteristic of the long view, with its sense of moving beyond proximal time and space, as outlined in greater detail in Chapter 8.

Historically Lithuanian culture developed differently from other nations. For very long time, we were at the edge of Europe. We were closed under the Iron Curtain for a very long time, and processes going on in the West did not touch our country. Were the last pagans in Europe, and the real agricultural workers (LT-Admin3, p. 2). First of all, by protecting nature. Future generations can’t survive with litter, devastation, weapons. Developed countries should pay attention to developing nations. Lithuania has a lot of experience protecting the environment. People should be told, educated, based on concrete examples (LT-Admin3, p. 4).

The special manner of administrators sensed in analysis Phases 1 and 2 comes across in this excerpt. Uniquely of the job roles, administrators are present in each of the four stages with heterogeneous response styles (Stages 2–5), yet their overview perspective is consistently apparent in comments such as those taking into consideration the type of students attending the school, or even cultural and historical conditions affecting the school and its community. Here, LT-Admin3’s comments set current experience within both historic and comparative international contexts, with concerns moving beyond those ordinarily discussed in the realm of a classroom or school. A strong sense of cultural identity is apparent here, along with a clear sense of responsibility to others in the present moment, to others in the future, and to Earth itself.

The following quote relating to the engagement strand touches on action as well as environmental literacy, a subtheme first illustrated here.

Nature-protecting program. There are 6 goals, for example, education about clean water, energy, climate change, integrate knowledge of Earth into subjects (LT-Admin3, p. 5). Teach a lot of students in countryside to use it properly – nature protection. Students are country children; pass skills on to pupils in town (LT-Admin3, p. 8).

Here this participant clarifies that the school's location ensures that the students are generally rural citizens of Lithuania. These students have a need to gain skills to protect their natural surroundings, but LT-Admin3 expresses the hope that these students might be in contact with students in more urban settings, passing on their understanding and skills regarding nature-protection. Although not outlined in detail, this might be considered a recognition and endorsement of an emerging 'ripple effect' (see also Table 15: "Insights into Sustainability Learning Programs" in Chapter 9, which captures many insights from the portraits of participants) by which positive knowledge and action are passed on to others.

The subthemes touched on by the Swedish caretaker are largely similar to those mentioned in the word map for LT-Admin3 above, except that 'values' was addressed with respect to Q3 while 'time' did not manifest in the response to Q4. As shown in the table outlining the subthemes for Q3 (Appendix S, Table S3), 'values' ranks at the same frequency as 'action'; with the other two subthemes, 'citizen' and 'topophilia', appearing with even greater frequency in the Q3 table. A more detailed discussion of the Q4 subthemes in the word map below is found in the preceding chapter, as well as in the following connection strand discussion.

Figure 12. Relationship of subthemes for SV-Care.

The excerpt below illustrating SV-Care's (thin) interpretation strand response has at its focus 'action', as shown by visiting real places with students that relate to understanding the environment.

He also does a lot of visits with the students and staff.... Environmental visits, energy plants, waste plants, and facilities where they produce heat, for example... (SV-Care, p. 1).

This statement reveals aspects of this school's manner of engaging its students, and echoes the statements of the school's administrator, SV-Admin1. As this school, SV-1, caters to students with special needs, making concrete impressions through visiting real sites is paramount in moving beyond the theoretical dimension of environmental problems and solutions.

In the following excerpt illustrating the connection strand, the basis for the word map above illustrating this participant, there is an undercurrent of uncertainty, as raised in the discussion of the same excerpt in the preceding chapter.

We are rooted to the Earth. In the Western world we are big consumers and a lot of humanity doesn't profit as we do. We need to take time and need to make whatever... (SV-Care, p. 3). We have been working at the whole school level, to be engaged in.... Maybe we need to move more on the societal level – reduce the use of energy, reduce the emission from cars, and so on. But will it be enough? (SV-Care, p. 4).

This excerpt begins with the participant's sense of his own and our collective connection with the Earth, moving on to a wider understanding of the justice and impact of consumerism on Earth and its inhabitants. There is a perception that change will unfold over time. In mentioning positive actions, it appears that he touches on the possibility of a ripple effect, similarly to LT-Admin3, of expanding the sphere of responsibility beyond the school to the larger society.

The emphasis with which SV-Care delivered the following response to a question in the engagement strand is difficult to convey, particularly as his statements were translated from Swedish by his colleague.

Education is the only way. (SV-Care, p. 4).

In this short statement, touching on both ‘responsibility’ and ‘environmental literacy’, illustrated first here, the participant’s clarity around the importance of education being the precursor to protecting this Earth is apparent. In many ways, the response given to Q4 touches on aspects of what might have been raised relating to the engagement strand, regarding actions available to individuals and society. In SV-Care’s responses to both connection and engagement strands, a sense of responsibility arises, a subtheme touched on by other participants within each of the engagement strand questions, and which is therefore a leading subtheme within the deep view associated with this strand, as discussed in the next chapter. SV-Care’s responses illustrate the eloquence sometimes apparent in statements of just four or five words.

These participants illustrate certain aspects of Stage 3 portraits, with both participants having word maps including two ellipses, representing two thick responses, rather than the single ellipse seen in Stage 2 word maps. There is also an increase in the number of subthemes, with five different subthemes as compared with four at Stage 2, as well as one instance of a repeated subtheme. The increases in the number of ellipses, the number of subthemes and the extent of repetition continue to be seen in the latter stages. Both of the participants illustrated here reveal a sense of responsibility to their school and to the communities to which they are members beyond the school, whether displaced in place or time, as well as to concomitant duties to this Earth.

Stage 4 Portraits

In Stage 4, the heterogeneous mixture of thick and thin responses follows a pattern in which the interpretation strand is thick, the connection strand is thick (mixed), and the engagement strand is thin (mixed). The first three stages include a thin response in the interpretation strand while the final three stages include a thick response in the interpretation strand; the difference between Stage 3 and 4 is in fact the appearance of this particular thick response. Stage 4 responses show a greater articulation of a participant's understanding of linkages through time, space or issue, but still with limited clarity about following through by engaging in activity.

Three participants have been selected for the Stage 4 portraits: CA-Teach4, LT-Teach5, and SV-Admin2. The trends of increasing complexity of response style that appeared in the transition from Stage 2 to Stage 3 word maps are also apparent in the Stage 4 word maps: an increased number of thick responses (with three responses covering all three strands of questions), an associated larger number of ellipses (three ellipses here), a larger number of different subthemes raised among the questions (between 7 and 11), and the repetition of key subthemes (in two of these three participants). Subtheme repetition is indicated by the subtheme in question appearing in bold if it is repeated over two questions, as with Stage 3, or in capital letters if it is repeated three or more times over different questions. The repeated subtheme may be in its own ellipse, connected to the question ellipses it is associated with, or it may appear in an overlapping area of two or more ellipses, as visual clarity demands. A significant reason for tracking repeated subthemes is that of the ten repeated subthemes (see Table 12) that appear in word maps of the portraits in this chapter, eight relate directly to the participants' emergent views, which are discussed in the next chapter. The following table indicates which of the ten most popular subthemes *overall* appear in these stage portraits, and may be used as a guiding link between the stage analysis here and the views analysis of the next chapter.

Table 12***Number of Word Maps Including Repeating Subthemes, as Contributing to Views***

Subtheme	View	Number of word maps with repetitions
action	all four views	6
time	all four views	5
leadership	long	3
topophilia	long	0
choices	wide	0
responsibility	deep	4
independence	deep	3
motivation	deep	2
one person	deep	1
thinking	dynamic	2
citizen	no views	2
interconnections	no views	1

Note in the table above that two of the subthemes contributing to the views (‘topophilia’ and ‘choices’) were not included in any word map. Also, there are two subthemes (‘citizen’ and ‘interconnections’) in the table that do not contribute to the views, but which were repeated in the word maps of one or two participants. Finally, although the order of subthemes listed in the table above is in the order of views’ subthemes discussed in Chapter 8, the number of repetitions indicated in the table here is the same rank order as that shown in Table T4, Appendix T, which tallies all participants with coded thick responses across the ten questions. This suggests that the strongest trends of frequency hold true within the subset of 16 participants illustrated in this chapter.

One participant illustrating Stage 4, SV-Admin2, has a large number of individual subthemes (10) for this stage in her word map, yet portrays no linking of subthemes between questions. She may have been influenced by her colleague, with whom she was interviewed, and who is the subject of one of the Stage 5 portraits. Of the other two participants in Stage 4 portraits, one includes one repeated subtheme, whereas the other includes two repeated

subthemes. This aspect of complexity of word maps is therefore an emerging one, shown by every participant in the latter stages (Stages 5 and 6). There are three subthemes touched on in the word maps or excerpts of each of these three participants: ‘time’, ‘motivation’ and ‘topophilia’. These three subthemes inform both the long and deep views of participants, discussed in the next chapter.

The word map for CA-Teach4 is the most complex of the three presented in Stage 4, with two repeated subthemes. The figure below reveals the least number of subthemes touched on by those participants illustrating Stage 4, with seven different subthemes among the three thick responses to Q1, Q3 and Q8. However, two subthemes are repeated, shown by the overlap between ellipses for Q1 and Q3 encircling ‘citizen’, as well as ‘time’, in Q3 and Q8. In both cases the overlap occurs between questions in different strands, forming links between responses in the interpretation, connection and engagement strands. As shown in Appendix T, Table T4, when considering all ten questions together, these two subthemes appear in the top 10 most frequently used subthemes overall, with ‘time’ as the second most frequently used subtheme for all coded responses.

Figure 13. Relationship of subthemes for CA-Teach4.

For the interpretation strand, the following excerpt was the basis for the codes illustrated for Q1 in the word map above.

I look at – at least at the high school level – trying to produce citizens that are environmentally aware and have some sort of compassion for the environment, for ecology and recognize our spot within it, that we’re part of it, not separate from it (CA-Teach4, p. 1).

Here, animated by compassion (see also Table 16: “Characteristics of Sustainability Chefs” in Chapter 9, which collects many characteristics referenced in these portraits and may be seen as a form of meta-portrait), the individual citizen is first grounded by the sense of interconnection in the web of life before assuming responsibility for it. All of this is set against the backdrop understanding that the individual is shaped and might act within the circumstances they face to an appropriate degree, shown by the code ‘appropriate scale’ and linked to the participant’s reference to expectations at the high school level. One of the other individuals coded for Q1, CA-Teach3, also addressed this subtheme. As CA-Teach3 and CA-Teach4 are colleagues at their school, CA-2, such commonality of subtheme use might provide insight regarding a guiding view at this school, or it might be an artifact born of the necessity of interviewing them together.

The following excerpt relating to the connection strand includes material not used in the preceding chapter or the word map above. In addition to the repeated subtheme ‘time’, four subthemes are first illustrated here: ‘balance’, ‘one person’, ‘motivation’ and ‘imperfect’.

A very good friend of mine ... she said to me – while they’re developing the Oak Ridges Moraine, well, the most important thing is the bottom line. And I find that ... I find that it’s everywhere around me, and I’m having a hard time negotiating my place within that.... I don’t think the future is going to be bright, and I don’t think it’s going to impact as much on my generation or if I have children, on their generation. But I think that beyond that, I just have a very negative prediction (CA-Teach4, p. 8). I’m finding it very difficult to say – okay I’m only one person

... let's do some little things, because I find that I get really angry with the state of the way things are (CA-Teach4, p. 9).

Beyond the coded subthemes in this excerpt are infused sentiments of both anger and despair which impact this participant's view but may also serve a purpose to motivate her as well. Both of these sentiments are represented as two of the grief stages described by Elizabeth Kübler-Ross (1969/2003). Although the grief stages initially outlined an individual's response when confronted with death, they are also applicable in circumstances of catastrophic personal loss, which may include the enormous environmental change currently taking place. The confusion around what constitutes right action when balancing myriad concerns, the feeling of isolation as just one person experiencing and ameliorating affairs, the inevitable imperfection of any action taken, and the need for continual renewal regarding motivation to act given the difficulties faced are all expressed by CA-Teach4 in this excerpt.

Regarding the engagement strand, the following excerpt touches on the subthemes of 'time' and 'multiple barriers/drivers'.

And I have found that hard – as I said with the sciences, it's so compartmentalized within the school – a lot of the subject areas are compartmentalized. To get people to sit down – we've been trying to for years and years, to do cross-curricular work – it's very difficult ... to sit down with a bunch of teachers from different departments and talk about sustainability.... If they don't believe in it to begin with, it's hard to convince them (CA-Teach4, p. 2).

Here, CA-Teach4 speaks of the difficulties experienced over a long period of time in engaging individuals within the school community, some of which are due to the organizational structure of the school itself and its departments. The most intransigent barrier to sustainability, however, is mentioned at the end of the excerpt: an individual's mind state. Other participants illustrated in later stages touch on possible solutions to this particular problem, but the fundamental fact remains that just as learning is impossible to coerce, so is a change of mind or heart.

The following two participants, LT-Teach5 and SV-Admin2, have both manifested more subthemes in their responses than CA-Teach4 did above, but with fewer repeated subthemes. The word map for LT-Teach5 below shows one repeated subtheme, ‘thinking’; her colleague LT-Admin3, illustrated in Stage 3, also showed one repeated subtheme, ‘time’. In fact, ‘thinking’ appears for both participants illustrated below. It is one of the top ten subthemes contributing to participants’ views, as it is a defining quality of the dynamic view (see Table 12). The other instance where ‘thinking’ is used in a repetitive manner may be seen in Stage 6, Figure 21, where CA-Coord touches on it twice within the engagement strand. Given that ‘thinking’ is associated with a number of different questions (SV-Admin2, Q1; LT-Teach5, Q5, Q7; CA-Coord, Q9, Q10), these three participants show that this subtheme may be associated with any of the three strands individually or in combination, another quality of the dynamic view. An issue of note regarding the excerpts for LT-Teach5 is that the translation provided for her was not as strong as for other participants. At points the translation difficulties necessitated speaking in French between ourselves rather than English with the translator, with the additional reliance on interpersonal cues in order to be aware to a greater extent of the import shared in the interview.

Figure 14. Relationship of subthemes for LT-Teach5.

The following excerpt touches on five different subthemes, including ‘choices’, and is illustrated in Q1 of the word map above. As will be seen in the Stage 5 portraits, other participants touch on ‘choices’ as well, as shown in their word maps or excerpts. The first appearance of this subtheme is significant in that it is a defining quality of the wide view associated with the interpretation strand, discussed in detail in the next chapter, but emerging with this Stage 4 participant. As shown in Appendix T, Table T4, the subtheme ‘choices’ is one of four subthemes, out of the top ten contributing to participants’ views, that appear exclusively among Stage 4–6 participants. These four subthemes, namely ‘independence’, ‘thinking’, ‘choices’ and ‘one person’, might therefore be considered indicators of a later-stage participant. In fact, the word map illustrating responses of LT-Teach5 in the three strands includes the first three of these subthemes.

That ecology, economy and society would be in balance. Education is very important in balancing these questions. We need to pay attention to ecological problems, so that we don’t return to the stone age, we need to balance environmental and economic problems. This concept was not new; we had a concept – “Noösphere” by Vladimir Vernadsky – focus on traditional citizenship, as they are formed at school (LT-Teach5, p. 1).

Interestingly, dialogues regarding Vernadsky’s theories relating to systems thinking and ESD remain current in the United States (Trubetskova, 2010). Out of the participants illustrated in the preceding chapter, only LT-Teach5 and the Stage 6 participants LT-Teach6 and CA-Coord addressed the subtheme of the three spheres of ESD directly and completely. In the cases of both LT-Teach5 and LT-Teach6, reference is made to ‘balance’ in conjunction with ‘three ESD spheres’. Although these teachers are not colleagues at the same school, they have participated at a number of workshops together and may be putting voice to a Lithuanian interpretation of ESD in relatively common currency in these circles. Three other participants selected for portraits, CA-Teach7 (Stage 2), CA-Teach1 (Stage 5) and LT-Coord (Stage 6), do touch on the

‘three ESD spheres’ subtheme, by referring to one or two aspects of the spheres in their interpretation strand excerpts.

The excerpt below illustrating the connection strand for LT-Teach5 touches on ‘time’ and ‘action’, as well as four subthemes first illustrated here, ‘topophilia’, ‘personal’, ‘leadership’ and ‘interconnections’.

Whoever we are, we are united by the Earth and ecological problems. To maintain our life functions, we eat, breathe and get fresh or polluted through the process. Solving ecological problems is very important. Lithuania may historically have been connected with the land, but as time goes on, this bond is being lost.... We must return to nature and preserve it (LT-Teach5, p. 3). First of all, I am a teacher of biology and chemistry and I teach children how to acknowledge nature. As a human being, I like to rest and recreate in it. From birth I am a villager [this village] and my mother is a farmer, a peasant, and I go to the farm to help on the land (LT-Teach5, p. 3).

The subthemes emerging from this excerpt frequently appear within the connection strand (Appendix T, Table T2). As shown in Appendix S, Tables S2 and S3 (the two questions where ‘topophilia’ arises as a subtheme), there are no other instances where the four subthemes of ‘topophilia’, ‘personal’, ‘leadership’ and ‘interconnections’ manifest within the same excerpt, so LT-Teach5 provides a unique sense of the texture of these subthemes when touched on together, and insight into the long view. Only CA-Teach1 in Q2 (illustrated in Chapter 6) and CA-Teach7 in Q3 (illustrated in Stage 2 portraits of this chapter) come close to this style of thick response, as they both touch on the same three subthemes (‘personal’, ‘interconnections’, ‘topophilia’). LT-Teach5 additionally touches on the notion of leadership. In this excerpt, the sense of topophilia is repeated a number of times, expressed from personal, historical, cultural and theoretical perspectives. LT-Teach5 states the double responsibility not only to return to nature and its protection but also, through leadership as an educator, to orient the children in her care and other contemporary Lithuanians towards this perspective.

In the engagement strand excerpt below, LT-Teach5 touches on the subthemes of ‘action’ and ‘environmental literacy’.

A main goal is cleaning of surroundings, sorting waste, saving energy. Teaching how to express oneself, deepening knowledge of surroundings (LT-Teach5, p. 5).

These two subthemes emerge particularly as they pertain to improving the state of the environment. However, LT-Teach5 also makes reference to the importance of communication skills, an issue raised by others such as CA-Coord (Stage 6) in the context of the engagement strand. Although discussed to a greater extent in the context of Stage 6 portraits, self-expression, in LT-Teach5’s comment on it, hints at a progression beyond connection, interpretation and action to include advocacy for the environment as well.

As shown in the figure below, the word map for SV-Admin2 is the most straightforward of the three used to illustrate Stage 4. There is no overlap of subthemes, yet this participant touches on a large number of different subthemes. Part of this might be an artifact of the interview since SV-Admin2 was interviewed at the same time as her Stage 5 colleague, SV-Teach2; otherwise it might possibly reflect a style of approach taken at their school, SV-2. Out of the ten different subthemes touched on, seven (‘independence’, ‘choices’, ‘time’, ‘action’, ‘motivation’, responsibility’ and ‘thinking’) are the same as those raised by SV-Teach2. It is not possible to determine whether SV-Admin2 might have responded differently, perhaps expressing fewer or different subthemes, if she had been interviewed separately. In fact, time constraints meant that most of the participants in this study were interviewed with one or more colleagues, rather than individually as originally requested (see Appendix A). This is one example where the interview arrangement possibly had an impact on the data collected.

Figure 15. Relationship of subthemes for SV-Admin2.

The following excerpt is the basis for the three subthemes listed under Q1 for the word map above. This participant touched on the smallest number of subthemes within the interpretation strand as compared to the other two participants illustrated in the Stage 4 portraits. Interestingly, SV-Admin2 has no overlap of subthemes with CA-Teach4 or LT-Teach5, who themselves overlapped with one subtheme, ‘citizen’ (see Appendix T, Table T1).

Our pupils shall have the opportunity to learn about the many things – that they can decide what is the best. It’s so difficult nowadays to make right decisions in society, to know lots of things – to mention anything – energy, or... (SV-Admin2, p. 1). Pupils should have experiences, concrete experiences... (SV-Admin2, p. 4).

An aspect of this excerpt is this administrator’s interest in encouraging students to gain the thinking skills that will allow them to develop their individual sovereignty in order to navigate the complex decisions associated with sustainability. An essential aspect of this skill is that it is evidenced in new situations, requiring individuals to move with a spirit of independence, beyond a straightforward application of the skill that may be discussed or even demonstrated in the school context. ‘Thinking’ is the key subtheme for the dynamic view, which itself serves as a context for the other three views associated with the question strands. As SV-Admin2 points out, however, the shift in thinking and the work as an independent agent begin with illustrations of experiences available in real life.

In the excerpt below for the connection strand, SV-Admin2 expresses the subthemes of ‘personal’, ‘thinking’ and, first illustrated here, ‘topophilia’:

Connection. I don’t know. I live in the country. I like the forest very much, and I live just near the sea, and I like the sea very, very much. And I care about the water, because I want fish in my sea, in my lake. I think about that. But actually, I don’t think so much as I should (SV-Admin2, p. 8).

Here SV-Admin2 expresses her personal connection to both the land and sea where she lives and the importance she attaches to it. Her statement moves from the sea as a general entity towards a sense of possessiveness, expressing desires for “my sea ... my lake”, and hoping that their ecosystems would remain healthy enough to support living organisms such as fish while remaining entities to feel connected to and admired by herself and others. She begins to move toward questioning what style of thinking would be needed in order to ensure local healthy ecosystems, but acknowledges she falls short in this regard.

The subthemes touched on by SV-Admin2 in the engagement strand excerpt below include ‘responsibility’, ‘action’ and, illustrated first here, ‘leadership’.

We can’t do it alone (SV-Admin2, p. 3). Good teachers. They have to show how they live, that they have to be ... the pupils have to believe them, and ... the teachers shall be joyful, and the rapport... (SV-Admin2, p. 11). [The students] have to feel that we care about them (SV-Admin2, p. 12).

As will be shown in word-mapping for other participants in Stages 5 and 6, the style of leadership is pointed out as an essential aspect of the EcoSchools program. Although ‘leadership’ is associated with each of the four connection strand questions, it appears with comparable frequency in the engagement strand (see Appendix T, Tables T2 and T3). In this excerpt, SV-Admin2 describes the importance of teachers leading by authentic example, in order that their chosen actions be aligned with the theory shared with students. She also touches on the style of communication between teacher and students, one based on a sense of good rapport,

rather than a directive-based style of teaching. In her view, good teachers have skills in both the leadership and communication arenas. One of the most significant statements in this excerpt, however, occurs in its first phrase. The acknowledgement that a problem is of sufficient size and complexity to require a shared sense of responsibility is actually a strength rather than an admission of defeat. It encourages a small community to move beyond its limitations, perhaps gaining numbers and skills through sharing with other individuals.

Various qualities of Stage 4 participants arise in the three portraits shared above. Along with the shift from thin to thick response in the interpretation strand, one also sees the emergence of the wide and dynamic views. The three subthemes touched on by all three of the participants are ‘time’, ‘motivation’ and ‘topophilia’, which inform both the long and deep views. All three individuals’ word maps include three thick responses, illustrated by three individual or overlapping ellipses touching on between 7 and 11 different subthemes (9 and 12 subthemes including repetitions). A greater degree of complexity of word maps is illustrated by the increase in repetitions of subthemes, as illustrated in the word map for CA-Teach 4, with two instances of overlap. Finally, a degree of expression emerges in the Stage 4 responses regarding the engagement strand that will be expanded on by the Stage 5 and 6 participants.

Stage 5 Portraits

In Stage 5, the heterogeneous mixture of thick and thin responses follows a pattern in which the interpretation strand is thick, the connection strand is thick (mixed), and the engagement strand is thick (mixed). The difference between Stage 4 and 5 is that the majority of responses in the engagement strand are now thick. The word maps for each of these participants involve between one and four repeated subthemes, as illustrated by overlapping ellipses or subthemes shown to connect to three or more different questions. Stage 5 responses reflect participants’ strong orientation towards ESD, their own place within the sphere of life, sound

expression of their ability to implement action that is in alignment with their stated interpretation of ESD, and the connections they experience.

Stage 5 represents the largest participant cohort of all stages, with nine participants in total, five of whom are used for the stage portraits: CA-Admin1, CA-Teach1, LT-Admin2, LT-Teach3 and SV-Teach2. Two of the three pairs of colleagues from the same school portrayed in this chapter appear in the Stage 5 cohort, including an administrator-teacher pair for each of Canada and Lithuania from the schools CA-1 and LT-2. The Swedish Stage 5 teacher SV-Teach2 appears in this chapter, who was interviewed with her administrator colleague from SV-2, SV-Admin2, who was portrayed in the Stage 4 discussion. Together these five participants show the continued increase in indicator trends for the style of their responses, with a larger number of thick responses (Stage 5 word maps include three to five ellipses, compared with two or three ellipses in Stage 4), a larger number of different subthemes (ranging from 11 to 17 for Stage 5, compared with the Stage 4 range of 9 to 12), and with significant repetition of subthemes made by each participant in the stage. The three subthemes touched on by each of these five participants in their word maps or excerpts are ‘action’, ‘responsibility’ and ‘leadership’, subthemes that are integral to the long view and the deep view. These views are associated with the connection and engagement strands, respectively, both of which now include a majority of thick responses in Stage 5. Almost all of the Stage 5 and 6 participants include one or more of a selection of six subthemes, all contributing to the views of participants, that appear in all three strands of questions for their word map or excerpts: CA-Admin1 (‘time’), CA-Teach1 (‘time’), LT-Admin2 (‘time’, ‘responsibility’), LT-Teach3 (‘action’), LT-Coord (‘action’, ‘thinking’), LT-Teach6 (‘action’, ‘time’) and CA-Coord, who includes the greatest number of subthemes touched on in all three question strands (‘time’, ‘action’, ‘leadership’ and ‘independence’). These six subthemes (‘time’, ‘action’, ‘responsibility’, ‘thinking’, ‘leadership’, ‘independence’) relate to three of the four sustainability views (long, deep and dynamic). The

consistency of their use across the three strands of question suggests these participants have particular clarity regarding their sustainability views, an observation developed to a greater extent in the following chapter.

The word map shown below for CA-Admin1 shows four subthemes that appear in two or more responses among the ten different subthemes referenced in the five analyzed questions. Of these ten subthemes, eight are shared by her colleague, CA-Teach1, as shown in Figure 17, with the two repeated subthemes ('time' and 'action') also being repeated terms for CA-Admin1.

Figure 16. Relationship of subthemes for CA-Admin1.

At this school, CA-1, a group interview involving all three of the participants was necessary due to time constraints. The iteration of subthemes between CA-Admin1 and CA-Teach1 might well be a window on the style of leadership and teaching at this school, an alternative school with a strong and unique ethos, aspects of which are apparent in the excerpts for both participants below. It could also be seen as an artifact of the interview or a reflection of the style of communication between the two colleagues. This latter suggestion could be supported by the fact that these two participants included repetitions of certain subthemes in the excerpts in this chapter, with both CA-Admin1 and CA-Teach1 repeating the subtheme 'leadership' (appearing in the connection and engagement strands). Additionally, CA-Teach1 repeated 'choices', in the interpretation and connection strands. Although CA-Admin1 touched on 'choices' in the

interpretation strand excerpt, the subtheme was not repeated by her, possibly due to the speaking order at that juncture in the interview, or a desire to avoid reiterating ground covered by her colleague or herself in an earlier question.

The word map for CA-Admin1 above shows the depth of the network linking her responses to the connection and engagement strand questions. The subthemes of ‘time’ and ‘action’, with three or more repetitions, strongly link the two question strands. In the following excerpt relating to the interpretation strand, CA-Admin1 again touches on ‘time’, along with ‘thinking’ and ‘choices’, first illustrated here:

I would also add that if [the students] value the lifestyle they have now, they are encouraged to reflect upon what it is that has provided that lifestyle, and what they can do given the resources that we have that provide for that lifestyle, to make sure that they maintain those resources into the future.... A more thoughtful stewardship perhaps, of what we have at our disposal (CA-Admin1, p. 1).

As illustrated in the word map above, CA-Admin1 touches on the subtheme of ‘time’ in three questions from the connection and engagement strand. The aspect of time in each of these cases is of time in the present moment, with comments such as that shared in relation to Q3 (discussed in the preceding chapter), “This is all that we have, right? The here and now, and for effecting change” (CA-Admin1, p. 6). However, in the excerpt here, as well as the one below, CA-Admin1 touches on future time (interpretation strand) or historic time juxtaposed to future time (connection strand). CA-Admin1 is therefore one of the few participants to put voice to all three dimensions of the subtheme of ‘time’ in the historic, present and future senses, with this tendency reflecting an interesting aspect of her sustainability perspective. For the interpretation strand excerpt, the three subthemes come together to underscore CA-Admin1’s perspective that individuals are stewards of the natural world for generations to come. A significant aspect of playing a role of stewardship is bringing a degree of awareness to the choices available to us,

taking care to select those choices that support balance between nature's capacity and human needs. This excerpt also shows the interaction between the wide view, with its key subtheme of 'choices', and the dynamic view, with its key subtheme of 'thinking', explored to a greater extent in the following chapter.

In the following excerpt relating to the connection strand, CA-Admin1 touches on the subthemes of 'time' and 'interconnections', as well as three subthemes first illustrated here of 'personal', 'topophilia' and 'leadership'.

For me, it was partly to do with my experiences at my cottage [in the Kawarthas]. One of the highlights of my childhood was coming up at May 24th weekend and the water would just be swarming with big bass. There would be bass nests – they made these little nests, they'd flatten them out with their tails, they lay eggs, and the mother would stand guard over the eggs until they hatched, and she would swim away. And I can't remember exactly when I noticed the first time I went up to the cottage in the spring and there were no bass nests.... And, I think I was at university, and I remember reading about acid rain, and that some fish had a very low tolerance for too much acidity in the water, and that bass were one of them. And, you know, we're not seeing those fish in my river any more, and I was feeling that that was a personal tragedy, that it was a thing that was really changing in my life.... And I frequently say [to my colleague], you know, people like you are going to be the guys that save the world from the rest of us, who stand and wonder where the fish babies went, but at the same time still drive a car everywhere and don't see the connection. And so, I'm seeing connections, but it's something that's very important to me. And also because I'm a parent and I want my son's children to see bass babies, bass hatchlings out there some day, but I don't know if that's going to happen (CA-Admin1, p. 3).

Two qualities present in this excerpt that have arisen elsewhere are of despair and uncertainty. CA-Admin1 describes environmental degradation as her personal tragedy in a manner similar to that touched on by CA-Teach4; the last line of her final statement is used to similar impact as that of SV-Care in his connection strand excerpt. Her colleague CA-Teach1, in her connection

strand excerpt (see the discussion immediately following), also expresses uncertainty, but this is juxtaposed with a sense of hope.

Aspects of the above excerpt are also similar to SV-Admin2's connection strand excerpt (see earlier), which also touches on 'personal' and 'topophilia' while speaking of the importance to her of a healthy natural world, one that would include fish in the sea, just as here CA-Admin1 speaks of the importance of fish babies in the waters at her cottage. The other similarity between these two administrators is that in SV-Admin2's engagement strand excerpt (see the earlier Stage 4 portrait), she emphasizes the importance of educators living in a manner that is aligned with the environmental issues presented in the classroom; that living with an authentic orientation towards sustainability is essential. Echoes of this are present in this excerpt by CA-Admin1, but she goes further, linking concepts that reside at the heart of the connection strand. A significant aspect of the connection strand relates to seeing the relationship between an action, such as driving a car, and its negative impact on the environment, often displaced in time and place, such as acid rain, while remaining motivated to make different choices in order to change the familiar, erosive cycle of cause and effect, shifting to one in harmony with sustainability. This topic of acid rain illustrates the links among participants' views relating the connection, interpretation and engagement strands, to be illustrated and developed in detail in the following chapter.

The word map for CA-Admin1 reveals that the one subtheme she repeats between engagement strand questions is 'one person'. This is the only time that 'one person' appears repeated within any of the word maps and is significant as it contributes to the deep view associated with the engagement strand. An aspect of CA-Admin1's word map that is in common with a number of other Stage 5 and 6 word maps is her use of the dominant subthemes. Out of the six most frequently used subthemes for the engagement strand, CA-Admin1 touches on the majority, with only LT-Teach6 (Stage 6) making use of all six (see Table T3, Appendix T). The

subthemes that appear in the following engagement strand excerpt are ‘action’, ‘motivation’ and ‘leadership’.

Well, to a certain extent, a lot of it is apathy.... Then somebody comes along and says, “But wait, we can reuse this paper and not put stuff in the recycling bin”. And to a certain extent the recycling bin goes a long way towards making you feel not that guilty. But if you put a piece of paper in the recycling bin that can be reused ... it doesn’t belong there, plain and simple (CA-Admin1, p. 10).

This excerpt gives insight into the way each person’s leadership skills may effect positive change around them, starting with observation of the circumstances faced and resulting in appropriate action. ‘Leadership’, associated with the long view of the connection strand, was also addressed by this participant in the excerpt relating to that strand. Here it is juxtaposed with ‘motivation’ in a manner that shows that determining appropriate action may not be equally apparent for everybody and exists on a grey scale. Changing behaviour in response to environmental issues may be hindered by a sense of apathy or by a lack of knowledge regarding options, rather than being enabled by the converse of these. Often the decision to change a behaviour is affected by the uncertainty of whether the action will be enough to make a difference. What CA-Admin1 states in this excerpt is that a complete application of skill regarding behaviour change is needed in most instances, at times guided by those around us towards improvement.

The following word map for CA-Teach1, a colleague of CA-Admin1, includes one more different subtheme (with 11 subthemes shown in CA-Teach1 word map, compared to 10 subthemes for CA-Admin1), but two fewer repetitions (two repetitions, rather than four), as compared to CA-Admin1’s portrait (illustrated in the previous figure of this section).

Figure 17. Relationship of subthemes for CA-Teach1.

The word map shows links between engagement strand questions as well as between the connection and engagement strand questions. The following excerpt relates to the interpretation strand and expresses the subthemes of ‘time’ as well as ‘choices’ and ‘three ESD spheres’, first illustrated here:

I think that what it really means is how to educate students to live in the future, given that we’re running out of a lot of resources and we have to walk more lightly on the Earth, and to help find solutions to some of the problems that we already experience (CA-Teach1, p. 1). And education for sustainable development is the next step after environmental studies. It’s not just about the environment, it’s about the status of women, and first nations, and how we use resources (CA-Teach1, p. 2).

The view of ESD is grounded for CA-Teach1 within the environmental sphere, extending to the social sphere, but not including the economic sphere. As other participants have touched on, she

emphasizes the importance of developing and communicating solutions, rather than just describing environmental problems. Her interpretation of ESD relates to holistic, life-skills education, supporting the students in her care into a time beyond school years, when they might face situations as yet unknown, but guided by the intention to “walk more lightly on the Earth”.

The subthemes manifested in the following connection strand excerpt are ‘time’, ‘topophilia’, ‘choices’ and, first illustrated here, ‘leadership’.

The concept of teaching environmental studies, there’s a lot of negative information, there’s a lot of suffering going on, to a lot of habitats, to a lot of creatures. So on one hand, it’s paramount that we let people know what’s happening – we can’t down-play it either. It doesn’t work. So what I’ve done over the years now, teaching environmental studies, is that I still try and maintain hope. And there’s days that I question that, but for the sake of the students, what I get them to focus on are alternatives, are solutions (CA-Teach1, p. 5). We are part of the Earth ... and I think that is fundamental. That’s the way I always teach.... I just think of it as earth, air, fire, water – like we are elements, we are part of the Earth, as are birds, as are trees, and all matter is constantly recycled.... So I think it’s sort of humbling, to teach this, that you know, we’re just like matter, we’re carbon, we’re a piece of toast; ashes to ashes, dust to dust (CA-Teach1, p. 6).

This excerpt relates the powerful topophilia experienced and shared by CA-Teach1: we are the Earth. If the Earth is distressed, so is each one of us. This distress is experienced from the macro level of the ecosphere to the microscopic molecular level. Part of ESD encompasses awareness of the suffering of living creatures on Earth, which itself may cause our own suffering in the form of anger, despair, or as expressed here, of uncertainty. A number of other participants touch on these issues, but fewer focus on solutions or the means for amelioration. Only two participants’ portraits, CA-Teach1 and CA-Coord, express hope in explicit terms.

CA-Teach1 is one of a number of Stage 5 and 6 participants who touch on the majority of dominant subthemes within the engagement strand. In the following engagement strand excerpt,

she touches on the subthemes of ‘action’, ‘time’, ‘responsibility’, ‘leadership’ and, first illustrated here, ‘thinking’.

I wondered why other people since then have not taken action, given that the information is there. Before we didn’t have information. We do now.... I think it’s somewhat criminal, when you know you can do something better or different and you choose not to. So I think for the future, one of my main concerns ... is that we need to have politicians who have an understanding of ecological literacy... (CA-Teach1, p. 8). Where would we put a composter, where is a good place for a composter, where it’s safe and it wouldn’t be vandalized? Who would turn it over? Who cares for it? ... I never even thought there was more to it in terms of there being a special goal. I think one of the goals of the program would be for students to become more active in their role in demanding environmental protection, in demanding changes from politicians, and to take jobs ... and to start taking over these positions with this knowledge.... It will be really exciting to have somebody who has this background knowledge ... attending an EcoSchool, going through a different program, and then becoming an urban planner. That’s the goal, right? That would be so beneficial to society (CA-Teach1, p. 13).

In this excerpt, this participant gives real examples of the combination of these subthemes at two different organization levels, of both school and society.

In the school, there are very real difficulties regarding the implementation of certain changes, such as the location and maintenance of a composter, an entity common in residential homes in Toronto. On the other hand, the school has a uniquely strong position to help influence society itself, by helping to shape the style of thinking and leadership qualities of individuals who will be part of coming generations of decision makers. As illustrated here, the scale of the issue appears to be unrelated to the experienced degree of difficulty or successes. Other participants mention the importance of building the EcoSchools program on a foundation of successes. Determining priorities and projects that would lead to success is possible only if the conditions faced by the individual school are known.

In the word map below for LT-Admin2, among the four questions with thick responses, 11 different subthemes are touched on, with one subtheme, 'time', referenced in three different questions covering the three strands of question.

Figure 18. Relationship of subthemes for LT-Admin2.

Out of these 11 subthemes, four are also touched on by his colleague, LT-Teach3, another Stage 5 participant: 'action', 'independence', 'responsibility' and 'leadership'. Although she was not staged, the third participant from this school, LT-Teach4, also touches on two subthemes mentioned by the other two, namely 'action' and 'leadership'. The interview at this school, LT-2, began with LT-Teach3 and LT-Teach4, with LT-Admin2 joining them just before LT-Teach4 needed to leave the interview for family reasons. LT-Teach3 was then completed the interview in conjunction with LT-Admin2. The overlap of subthemes, particularly between LT-Admin2 and LT-Teach3, presents less as an artifact of the nature of the interview or even the nature of the school itself than as a feature of the individuals being interviewed. The differences in these

individuals comes across to a greater degree in the excerpts included below. The following excerpt for the interpretation strand touches on five subthemes.

Preparing a person for the future. Need to instil idea that people give back to society, not only use what society gives to them. When speak of school, know that families are involved, and they must help us involve children. This must be integrated into every subject, as it is interconnected (LT-Admin2, p. 5).

In two ways this excerpt echoes the statement made by his colleague, LT-Teach4, illustrated in the preceding chapter (Q1, sample thick responses), with her statement that we need to “integrate all subjects” into ESD and that ESD needs to “be connected with our true life, our real life” (LT-Teach4, p. 3). The statement by LT-Admin2 begins with the concept that a main focus of the work of educators is to prepare students in such a way that they will find success in the unknown future they will find in their lives, rather than to focus exclusively on helping them achieve a specific goal, such as exam results, while they are in the care of the school. This is a reflection of a viewpoint shared by CA-Teach1 above. Due to the degree that ESD infuses into all subjects, this is not left in the purview of particular areas, such as science, but rather is a shared responsibility among all subject areas in the school. In fact, LT-Admin2 extends the circle of influence beyond the school to the families of the children in order to engage them in the present moment and to support them in sustainability in their real lives beyond the schooling years. If the sense of responsibility to students is great, then so too is the sense that it is reciprocated by a style of leadership on the part of the students to give back to society itself, since so many of society’s members have contributed to the students’ skill development.

The subthemes of ‘leadership’ and ‘responsibility’ are touched on again by LT-Admin2 in the following excerpt for the connection strand, in addition to the subthemes of ‘time’ and ‘topophilia’.

The Soviet heritage will be seen in the future for a long time. A lot of polluted rivers, water, earth. Even now we don’t know what is under our earth – finding

buried weapons and rockets. Most important things to Lithuania are agricultural: land, forests, water. We have no oil, so we have to depend on other nations (LT-Admin2, p. 7). Understanding that everything depends on us; nothing will happen without integration and international changes. Without bright students, we won't do anything. Social structures and the law must be real, we must trust them (LT-Admin2, p. 8). Person himself has to understand why doing this (LT-Admin2, p. 12).

In a manner similar to that of CA-Admin1, the sense of past, present and future time pervades this excerpt, as LT-Admin2 discusses the influence of the Soviet regime on the land of his nation and the transformative power of the spirit of Lithuanians. The responsibility for a positive future is shared with structures far beyond the scope of his school, and includes the rule of law and changes internationally. Although the work in his school is his primary concern, he places it within a much larger sphere of sustainability efforts. Two key aspects of the EcoSchools program and of ESD that are beyond control are elucidated here: the number of 'bright' students enrolled in a school, and the intrinsic leadership qualities of any given student. Other participants also touch on this quandary, such as CA-Teach4 and SV-Admin1, when questioning how to engage others, or by stating simply, "the fundamental thing was that we wanted to do it" (SV-Admin1, p. 12). Schools do find themselves in the happy circumstance of having capable students engaged in moving the community towards a sustainable future. However, as these factors are beyond control or coercion if this is not the case, efforts would reasonably focus on the conditions for them to arise.

In the engagement strand excerpt below, LT-Admin2 again touches on the subtheme of 'responsibility', as well as 'action' and 'independence'.

Getting the Green Flag is the biggest success. Most important thing – that ecological problems are most urgent, not only in this school but in our society life as well (LT-Admin2, p. 10). In an educational organization, it's difficult to say that we've achieved everything (LT-Admin2, p. 13).

LT-Admin2 is one of a group of four participants, including LT-Coord, LT-Teach6 and CA-Coord, to include two or more subthemes in all three strands of questions. The subthemes of ‘time’ and ‘responsibility’ are carried through each of the three strands of questions for LT-Admin2, whether in the word map or extracts, and so provide a hub of focus as well as a sense of continuity of style for this participant. A point to note is that LT-Admin2 contradicts himself within the engagement strand of questions. As illustrated in the Q9 discussion of the preceding chapter, his view regarding project priorities was: “Main goal isn’t to keep the Green Flag, it is to develop our work” (LT-Admin2, p. 11), yet in the excerpt above, just a page earlier in the transcript of the interview, he states, “Getting the Green Flag is the biggest success”. Perhaps the degree of this contradiction is softened by the fact that immediately after this statement he underscores that ecological problems themselves are the “most important thing”. The main goal, then, becomes addressing the urgent problems faced in the natural world, which may include and go beyond the prescriptions of a program like EcoSchools. In doing so, the responsibility is shared by society at large. The excerpt ends on a note of uncertainty similar to that raised by other participants (such as CA-Teach1 and SV-Care), an aspect that may inform his orientation towards and motivation regarding sustainability.

The following word map for LT-Teach3 illustrates her responses to three questions. The link between the interpretation and engagement strands is the subtheme ‘action’, touched on in all three interview questions illustrated above. An interesting comparison is with the role of the subtheme ‘time’ in LT-Admin2’s word map (Figure 18); these two word maps reveal comparably developed yet thematically distinct sustainability perspectives. The word map also illustrates that LT-Teach3 touches on each of the four later-stage subthemes: ‘independence’, ‘choices’, ‘thinking’ and ‘one person’. These four subthemes inform three of the views of participants, the wide, deep and dynamic views, but they may also be used as a form of later-

stage proxy indicator, in that they appear exclusively in Stages 4–6 (see Chapter 8). Only two other participants touch on all four of these later-stage subthemes, SV-Teach2 and CA-Coord.

Figure 19. Relationship of subthemes for LT-Teach3.

The following excerpt relates to the interpretation strand illustrated in Q1 above, touching on ‘action’, ‘balance’ and ‘choices’.

This term, “education for sustainability” developed from the term “balanced development” ... in 1992. Information board for a subject is important (LT-Teach3, p. 3).

Part of the meaning of this excerpt is lost, as much was conveyed in the interview in both body language and gesturing to displays in the teaching room. For instance, the information board referred to by LT-Teach3 was a lively, informative display regarding environmental issues from the perspective of both problems and solutions. It had been a focus of discussion during the school tour, a part of the day not formally recorded. The approach in this school, particularly led

by LT-Teach3 and her colleague LT-Teach4, was one that would emphasize the necessity of taking action, as both teachers included this subtheme repeatedly in their interview responses, as well as providing choices for the students to make in their own actions. The third subtheme of ‘balance’ touched on by LT-Teach3 emerges from the original definition of sustainable development, which indicates the spheres of sustainability as balanced to the greatest degree possible within the circumstances.

For the connection strand excerpt, three subthemes are expressed, including ‘action’, ‘responsibility’ and, first illustrated here, ‘nature of change’:

She wanted to change her activities in this trend, to change her professional practice. Biology syllabus changed to be more integrated – no longer zoology, botany – now “nature and man” (LT-Teach3, p. 3). The government needs to change laws to not destroy nature, because a lot of the forests are private, which is not good (LT-Teach3, p. 5).

This excerpt reflects the shared responsibility that LT-Teach3 conceives sustainability to be, with individuals and institutions beyond herself engaged to protect nature. In her professional life, change infused into the curriculum of her primary teaching subject, biology, evidenced in a shift away from the mosaic of disciplines and towards a holistic orientation, emphasizing the relationship between humans and their environment. Alongside these changes imposed on her, LT-Teach3 expresses a desire to reorient her own professional practice towards sustainability to a greater degree. Springing from her own changed actions arises her influence on those around her, including the students in her care.

The first part of the following excerpt relates to the engagement strand and touches on the subthemes of ‘action’, ‘responsibility’ and ‘independence’, as discussed in the preceding chapter’s illustration of Q6, as well as, illustrated first here, ‘leadership’.

Main purpose is to have a strong relationship with our society. Improve students, parents, foresters. Participants, the children, would be able to suggest how to

solve these problems by themselves (LT-Teach3, p. 9). The students involved in EcoSchools seem more interested in going into higher education (LT-Teach3, p. 12).

The final comment in this excerpt is significant as it is unique in the portraits. Other participants have commented on the degree of academic and co-curricular engagement of students in their care, such as CA-Teach3, or the role the students in their care may take after they leave school, such as CA-Teach1, or CA-Coord (included in the Stage 6 portraits) who mentions that a number of her former environmental club students have entered university. However, LT-Teach3 is the only participant who suggested that involvement in the EcoSchools program might be something of a proxy indicator for moving into higher education (or vice versa). It is not clear whether the students would or would not have expressed an interest and developed the required skills to enter higher education if they had not participated in the EcoSchools program, but engaging with EcoSchools appears to be something of a predictor for continuing in education.

In the word map for SV-Teach2 below, three repeated subthemes emerge from three different engagement strand questions. Seven of the 13 different subthemes for this participant were also used by her colleague, SV-Admin2. There is one instance where all of the subthemes touched on by SV-Admin2 were also used by SV-Teach2; in particular, the subthemes of ‘action’, ‘motivation’ and ‘responsibility’ were repeated. Interestingly, these subthemes were used by the administrator in response to Q7 regarding their biggest successes, and by the teacher to Q10 regarding the goals that would have been met by the school regardless of implementing the EcoSchools program. As suggested in the earlier section relating to SV-Admin2, aspects of the word maps for these two participants may indicate an effect of interviewing them together. However, the repetition of this cohort of subthemes in different engagement strand questions may actually reflect aspects of the style of engagement at this school, SV-2, with individuals emphasizing the shared nature of responsibility for sustainability beyond the ordinary school

remit: maintain motivation to take action while involving industry and the rule of law to shift society towards a sustainable future.

Figure 20. Relationship of subthemes for SV-Teach2.

For the interpretation strand, the following excerpt touches on the subthemes of ‘time’, ‘choices’ and ‘independence’.

To prepare for the future and also give them the chance to see different views of things so that they really can do wise decisions (SV-Teach2, p. 1).

SV-Teach2 is one of a group of three participants, including LT-Teach3 and CA-Coord, who use all four of the later-stage indicator subthemes of ‘independence’, ‘choices’, ‘thinking’ and ‘one person’. However, SV-Teach2 is the only one to make use of two of them in each of the three strands of questions, with ‘choices’ and ‘independence’ used within the interpretation strand, ‘choices’ and ‘one person’ within the connection strand, and ‘independence’ and ‘thinking’ within the engagement strand. The subthemes come together in the excerpt above to emphasize

the shaping of the skills of students to support them in the circumstances they will find themselves in when they have moved beyond their schooling years. The subtheme of ‘independence’, describing the ability to think for oneself in fostering their unique sustainability style, is particularly significant as it is repeated within the engagement strand of questions.

The following excerpt for the connection strand touches on the subtheme of ‘time’ as well as ‘topophilia’ and ‘interconnections’, first illustrated here:

I think people are connected. I really think that they’re not always aware of it. They are connected, and often people ... if you look at nature and if you go outside or into the forest, lots of people think it’s really, really beautiful and they like the clean nature and everything, but they’re not aware of what they are doing in their other part.... And I think it’s worse today, because you don’t have your own garbage, for example, not just by your house.... My grandfather, for example, he would dig it down ... and then suddenly, like nowadays ... it can come up when it’s cold or something, because they had dug it down. But they could see the problem. Because when you had garbage, you just see it. And now it just disappears (SV-Teach2, p. 6). I am a biologist, so I’m very interested in nature and I think just to walk in the forest or go to mountains and walk there, I really like it, because I don’t know – it’s some kind of state of connection (SV-Teach2, p. 8).

The topophilia experienced and understood by this participant imbues this excerpt. The sense of topophilia may be considered unidirectional in that it describes the pleasure experienced by an individual through their love of place. Taken on its own, the use of the subtheme ‘interconnections’ is also unidirectional, acknowledging the domino effect of actions in the environment. Of interest here is the conjunction of ‘topophilia’ with ‘interconnections’, where aspects of the love of place become reciprocal or bidirectional. The individual then both receives and gives back to the natural world, of which they are a part, in a manner that is in harmony with their love of place. These two subthemes appear in the response to a question (Q2, Q3, or within a connection strand excerpt portrait of this chapter) in the case of seven different participants,

most of whom are illustrated in the portraits of this chapter (CA-Coord, CA-Admin1, CA-Teach1, SV-Teach2, LT-Teach7, CA-Teach7 and SV-Admin1).

In the example mentioned by SV-Teach2 above, she suggests that individuals may not realize their impact on the environment since many of the difficult environmental problems do not have a visible, physical presence, or may not be obvious to onlookers. This situation was described by CA-Teach1 regarding heirloom corn seeds in her thick response to Q7, discussed in Chapter 6. How can individuals be guided in situations where many serious environmental threats lack visibility? The answer springs from the reciprocal relationship of individuals and nature, where harm to one causes harm to the other; an increasingly sustainable approach with one supports a sustainable future. This principle guides choices, behaviours and skill development, as SV-Teach2 speaks of our choices around domestic waste production in the excerpt above.

SV-Teach2 is one of a cohort of participants who make use of the majority or all of the top half dozen engagement strand subthemes (see Table T3, Appendix T), suggesting this participant has a strong commitment to sustainability engagement. The repetitions of three different subthemes by SV-Teach2 all occur within the engagement strand and are integral to the long and deep views. The same four subthemes manifest in the engagement strand excerpt below as those touched on in relation to Q8, illustrated in the word map above and discussed in more detail in the preceding chapter. This engagement strand excerpt suggests that students themselves are a school's biggest impact on the environment.

When we discussed it ... because when you should decide what, if you look at a school or something, you should decide how does this school, for example ... impact the environment.... First of course we talked about how we use a lot of paper, and we use a lot of energy. But the most important thing is what we are letting out of the school, through the school doors, the pupils. And how they impact on the environment. That is the most important impact we have on the

environment (SV-Teach2, p. 10). And we sat down and talked about these things. And also when you talk about the environment you talk about the physical factors – we use a lot of energy, we use a lot of paper, and everything – our dishwashers, it was really, these physical things ... but then we started to discuss this even deeper. And it took several times to do this. Then *we came to the decision that it's the pupils ... and their behaviour ... it's the most important thing of all*, to have affected them in certain ways.... The teacher must be able to interest the pupils, and I think you have to have this connection to the pupils and they see, hopefully they see us as role models. And you have to act ... like if I talked about the environment and the next day.... And show them how you can do things, and it's not like I'm just talking (emphasis added; SV-Teach2, p. 11). And I think at this age I think it's very important that you see them as adults, not children (SV-Teach2, p. 12).

In its focus on the students as the school's biggest impact on the environment and the clearest sustainability indicator, SV-Teach2 is moving away from the details of concern that divert many adults engaged with sustainability, such as waste production or resource depletion. Here, this participant moves to the big picture in recognizing that individuals represent the biggest impact of the school on the environment, through the choices they make. Seen in this light, the quality of thinking and choice of behaviour of individuals becomes a sustainability program's focus as well as the indicator of its success. These very points are also made by Stage 6 participants LT-Coord and CA-Coord. In the excerpt here, SV-Teach2 comments on the importance of the leadership style used, with teachers leading by example in their own lives. She also suggests that a useful style of communication with students, particularly for the older students, is one moving towards facilitation. Points regarding communication style are also developed by CA-Coord.

The portraits included in Stage 5 reveal different qualities regarding the participants of this stage, which includes the largest number of participants. The portraits showed the greatest range of thick responses, with word maps including between 3 and 5 ellipses, touching on between 8 and 13 different subthemes (between 11 and 17 subthemes including repetitions), with

varying degrees of repetition or connectivity between ellipses (between one and four different subthemes were repeated by individual participants). Three subthemes were touched on by all five of the participants, including ‘action’, ‘responsibility’ and ‘leadership’. In the case of four out of the five participants, one or two subthemes (such as ‘time’, ‘action’, ‘responsibility’) appeared in all three strands of questions. Two of these portraits (LT-Teach3, SV-Teach2) include all four of the later-stage indicator subthemes, ‘independence’, ‘choices’, ‘one person’ and ‘thinking’. Of the ten subthemes integral to participants’ views, seven are included in word maps of these portraits, each repeated two or more times (‘time’, ‘action’, ‘responsibility’, ‘independence’, motivation’, ‘leadership’ and ‘one person’). The subtheme ‘leadership’ contributes to the long view of the connection strand, while all the other subthemes contribute to the deep view of the engagement strand. Given that a key quality of Stage 5 is the transition to a majority of thick responses in the engagement strand, the appearance of subthemes contributing to the view associated with this strand (the deep view) is consistent with what one would expect. Of particular interest are the two subthemes, ‘action’ and ‘responsibility’, that appear in three of the different groupings of subthemes mentioned here, giving an insight into a pronounced trend in Stage 5 responses. Together these two subthemes underscore the belief that sustainability is fostered through collaborative action, sharing the responsibility for shaping a liveable future among individuals and across communities. This style of action is not simply aligned with but also strengthens participants’ connection to and interpretation of the environment.

Stage 6 Portraits

For the Stage 6 participants, the responses to the interview questions in the three strands are homogeneously thick. In the word maps presented here, for the three Stage 6 participants CA-Coord, LT-Coord and LT-Teach6, the top of the range in indicator trends for response style is revealed by the inclusion of five ellipses in their word maps, a large number of different

subthemes and repetition of those subthemes (from 12 to 16, or from 18 to 23 counting repetitions), including a number of subthemes repeated (between three and six different ones) by each participant. This group of participants also shares the largest number of subthemes with each other, with 11 subthemes being touched on by all three in their portraits' word maps or excerpts. These 11 subthemes are: *'action'*, *'time'*, *'responsibility'*, *'leadership'*, *'thinking'*, *'topophilia'*, *'independence'*, *'motivation'*, *'integration'*, *'three ESD spheres'*, *'imperfect'*. Among these are included eight (indicated through italics in the previous sentence) of the ten subthemes which also inform the four views of participants (see Table 12). Not surprisingly, the views as illustrated in the following chapter reveal strong reflections among the Stage 6 participants. A sense of homogeneity is apparent both within and between these three portraits, giving voice to an orientation that is strongly engaged, whether in the interpretation of, connection to or engagement with a sustainable future. The sustainability style of each of these participants is characterized below, but what they share is a clear and detailed description of the type of action that supports a liveable future.

In the word map below for CA-Coord, the largest number of different subthemes (16) are raised among all of the three Stage 6 participants. Through word maps or excerpts, four subthemes (*'action'*, *'leadership'*, *'time'*, *'independence'*) arise in all three strands of questions for CA-Coord. This is suggestive that her style encourages individuals to thoughtfully determine for themselves their own choices regarding sustainability, while being sensitive to time. CA-Coord is the only individual to repeat the subtheme *'interconnections'*, doing so in questions associated with both the connection and engagement strands. The significance of the repetition of this subtheme is that it shows the bidirectional qualities of connection with and action regarding the environment, as discussed in relation to SV-Teach2. This word map also shows that, along with LT-Teach3 and SV-Teach2, CA-Coord includes all four of the subthemes indicating a later stage: *'independence'*, *'choices'*, *'one person'* and *'thinking'*. The fact that the

subtheme of ‘thinking’ is repeated in two engagement strand questions suggests that for CA-Coord, authentic engagement with a sustainability program is preceded and accompanied by a shift in the quality of thinking, a concept that is underscored in the discussion to follow of the final excerpt for CA-Coord, relating to the engagement strand.

Figure 21. Relationship of subthemes for CA-Coord.

For the interpretation strand, the following excerpt is illustrated in the word map above (see Q1 ellipse) and discussed in greater detail in the preceding chapter. It touches on six different subthemes.

Understanding and seeing the world through the three lenses of environment, economy, society; be given the skills to make changes in the world, in our own circle of influence, to whatever extent we can; by doing that we will more sustainably lengthen the life of the world and the possibilities of it (CA-Coord, p. 26).

Although all three strands of ESD are mentioned, the emphasis in this excerpt is on the environmental strand and efforts to ensure its longevity. The subthemes of ‘leadership’ and ‘action’ link this strand to both the connection and engagement strand of questions, being repeated two or three times respectively. Together they describe the style of action to be taken by an individual, as outlined in the excerpt above. The very foundation of this leadership style is a set of skills enabling beneficial changes to be made in the world. In the excerpts to follow, CA-Coord outlines the nature of the required skills.

The excerpt for the connection strand is divided into two parts, in the first of which CA-Coord touches on the subthemes of ‘topophilia’ and ‘interconnections’, while the second part touches on ‘leadership’, ‘responsibility’, ‘action’, ‘time’ and ‘imperfect’. Both Q3 and this excerpt touch on the subthemes of ‘topophilia’ in conjunction with ‘interconnections’, an indicator of a bidirectional relationship with the environment.

How much we are under the control of the environment! Mine [my attitude] is one of appreciation, but not enough, because I haven’t had enough of those outdoor experiences – I love it. I did outdoor winter camping in my Phys Ed program. Unless you do more of that, then you don’t understand that it’s a contender. We think – through technology we can overcome everything. Until you experience Katrina or an earthquake, you don’t realize that nothing – no infrastructure – can withstand that. Unless you take time to go out into the woods, appreciate nature, you’re going to be very disconnected. Then you would be more *intellectually* dependent on understanding why we are so dependent on the Earth (emphasis added; CA-Coord, p. 29).

The excerpt above outlines the importance of visceral connections with the natural world, and their significance in maintaining a balanced view of the relative abilities of humans in the sphere of life. Without a grounding of personal experiences in nature, the lessons related to sustainability are relegated to the realm of the theoretical, much like other lessons in classrooms students attend in the course of the day as they follow their timetable. As CA-Coord argues,

however, it is these sustainability lessons that must precede and will ultimately supersede others, offering a shift in paradigm for understanding the interconnections between our species and the world around us.

In the second part of the connection strand excerpt, shown below, CA-Coord's comments encircle the concept of hope as a hub for change and action.

So if we can empower our kids to see a problem in the school – in our own local, immediate place, and empower them, and give them a chance to make a difference – then we're going to give them hope for the future. Then we start to move on to bigger and bigger things.... The people with the power to make those types of changes in a school – I think we have a responsibility to provide an opportunity for success for our students. And it's got to start with that – and then it moves up to other, more complicated things (CA-Coord, p. 32).

The concept of hope was explicitly raised by only one other participant, CA-Teach1, as illustrated in Stage 5, in her connection strand excerpt. Here, hope is an essential but almost intangible ingredient needed by a community, particularly its younger members. CA-Coord, with the overview perspective of a coordinator, has an understanding of the abilities and responsibilities of the different members of a school community. She states the duty of those able to support a sustainability project: not simply to reveal the problems that need addressing, but to create opportunities for solutions to be realized, in an incremental fashion leading to success. CA-Coord stresses the importance of bringing about change in a place proximal to the students because it is in that way that the students will see the connections between their choice of actions and positive change, resolving the theoretical dyad of problems and solutions. Like ripples in water, building on success brought about in the local environment provides a sense of connection and it is the foundation for realizing the greater complexity of interconnections, with its associations that local actions may have positive effects in non-proximal time or place.

Another aspect implied by this excerpt is that of exposing students to opportunities where they can practice their sustainability skills and experience success. Crucially CA-Coord sees sustainability as a practice: a process that brings increasing awareness as well as liberation from fixed thinking as students and educators work through challenges, developing their new cognitive skills through concrete, meaningful experience.

To facilitate discussion, the long excerpt for the engagement strand for CA-Coord is separated into five smaller excerpts, presented in sequential order from the transcript. Ten different subthemes are touched on throughout this long excerpt, namely ‘leadership’, ‘imperfect’, ‘patience’, ‘time’, ‘motivation’, ‘action’, ‘one person’, ‘thinking’, ‘independence’, ‘responsibility’ and ‘interconnections’. The last six of these subthemes appeared specifically in Q9 and Q10, as illustrated in the word map for CA-Coord, with ‘interconnections’ also being raised in the connection strand (see Q3 ellipse). Two subthemes are first illustrated in the context of these excerpts: ‘patience’ and ‘motivation’.

In the first excerpt, five different subthemes are touched on, including ‘thinking’, ‘action’, ‘leadership’, ‘time’ and ‘independence’:

I really believe that if you can get kids thinking, and then follow it through with a decision, like an action, with authentic audiences, and with authentic projects of things that they would do – that’s going to teach them more about the environment. So it’s your means to get to environmental issues. Without that, and just telling them this is an environmental issue, and not getting them to think critically about it, they’re not going to be any further ahead, because it’s just going to be about that specific issue that they’ve been told about. They haven’t gone through a process of looking at it differently.... As adults, it’s the same thing – citizens in a democratic society, you just say, “who cares? I don’t know any better. I just want what’s good for me right now.” ... They’re short-sighted, they don’t have a way of approaching problems (CA-Coord, p. 7).

Uniquely presented by CA-Coord in this excerpt is the suggestion that there exists a positive feedback cycle between learning about the environment and engaging with environmental issues. This is an instance of double-loop learning as described by Argyris and Schön: “Learning that results in a change in the values of theory-in-use” (Scott & Gough, 2004, p. 65). By engaging with the issues, a student’s orientation shifts from the passive to the active voice, which sets the conditions for more action within the sphere of environmental issues. The catalyst for the shift as well as the sustaining essence for the feedback cycle is the quality of thinking. Thinking then moves from a product, where students are asked to think about or to consider a problem, to a process that enables students to engage with problems, most of which they will encounter in a time and world beyond the classroom. As CA-Coord states, the starting point for this process would be authentic projects with authentic audiences, located to begin with in the immediately available community of the school and its circle of influence. The use of the word ‘authentic’ is a reflection of CA-Coord’s own manner of engaging with sustainability programs, as entities that are not theoretical constructs but rather represent reality in a truly genuine way, one that students and others deserve to be exposed to and enabled to engage with.

In the second engagement strand excerpt below, CA-Coord expands on what is entailed with engaging in authentic projects as well as the results. In doing so, she touches on the subthemes of ‘leadership’, ‘independence’, ‘imperfect’, ‘time’, ‘action’ and ‘responsibility’. Also, first illustrated here is the subtheme of ‘patience’, seen from the perspective of the professional educator incrementally building up the skills of students over a long period of time in order to build the foundations of a successful program.

I’ve really seen it with my SEN kids (Student Environment Network Club). I guess there’s eight of them that have gone to university now and they just feel that they can make a difference. They feel the confidence because they have the tools, they know what to do (CA-Coord, p. 16). And we pick little issues ... that they can start to try and help. But we also guide that through. Because they’ve got

tons of great ideas for solutions. But one thing that I sort of had to impose on them was ... before we start doing this and you become leaders of that – you’ve got to bring your own waste-free lunches. And after we’ve all done that for two weeks, consistently ... and then they started to understand how hard it is. And maybe mum doesn’t buy into this. So how do you negotiate with her. And they’re going to go out and tell other kids they’re going to have to do it.... They’ll be more understanding of them, giving them suggestions, rather than just telling them to.... That compassion part has to be.... Compassion really is that whole multi-stakeholder viewpoint. It’s understanding there are different viewpoints, and you’re going to come up against this. So don’t be so self-righteous when you go and start this problem-solving. It’s really understanding human nature. And until they experience it themselves, they’re not going to be sensitive enough to it (CA-Coord, p. 33).

A key aspect of this excerpt relates to the word ‘compassion’ in conjunction with ‘communication’, terms that give insight into the sustainability style of CA-Coord. Here compassion reflects a process of an individual engaging with environmental issues, and from that experience, sharing the insight with others going through similar experiences. Compassion is a form of alive awareness born of experience that connects individuals. CA-Coord suggests compassion is a foundation from which springs not only action but also the way in which individuals work with others through communication. Many participants have touched on the importance of sharing the responsibility with others, but few have stated the link to a mode of communication that would include working with others to bring about fruitful negotiation, as CA-Coord suggests in this excerpt, and which has been referred to by Scott and Gough (2003, p. 40) as mediated learning. Significantly in this excerpt, CA-Coord includes herself in the memory of bringing waste-free lunches to school. She states that, “after we’ve all done that for two weeks” they would have gained sufficient sensitivity from personal experience to be able to be leaders, authentic leaders, of this particular sustainability program. The importance of role modelling by teachers, reflects a consistency between lessons spoken and lived. Other

participants have made similar points, such as SV-Teach2 in the previous section. In this way CA-Coord shares a glimpse into her own sustainability orientation, where the term ‘compassion’ encompasses a view that sustainability begins with the self, the present, the immediate here, as opposed to shifting responsibility to another person, time or place.

The subtheme of ‘responsibility’ is also touched on in the third engagement excerpt below, as CA-Coord outlines aspects of the process and products of creating an EcoTeam, along with the subthemes of ‘interconnections’, ‘leadership’, ‘one person’ and ‘motivation’, first illustrated here.

If they even had an interested EcoTeam, like an Environment Club, I would go to their Environment Club, then.... That’s how I get into that door – that’s my doorway to get in.... You get in through whoever you can (CA-Coord, p. 42). If you mandate the program, what you’ll get is a lot of lip-service.... But once the kids leave, they’re not going to change the way they behave outside of that school system.... It’s not going to be sustainable changes. They’re not going to be able to see that they can make a difference. Or that this is something they really believe in, or this is why.... That process part of it is not going to be in there – or that background understanding (CA-Coord, p. 43). Kids on a multistakeholder team keeps them honest, since everyone signs off on the documents to say they are true (CA-Coord, p. 44). This program supports a heightened status of environmental behaviours and issues. It shows the interconnections among economy, environment and society. A huge part is raising the status of kids – valuing their leadership in making this program possible. The multi-stakeholders’ [perspective] – valuing others’ roles also comes out. The environmental clubs are key, of primary importance – then the caretaker, and the principal would be third (CA-Coord, p. 45). If I were changing the certification, I would want to include how many students are involved in the leadership of this, the running of it. And how many students are involved in participating in the program (CA-Coord, p. 47).

This excerpt begins with CA-Coord's statement that an authentic sustainability program, one that would sustain itself over time, cannot be mandated; participation cannot be coerced. In her role as coordinator, she found that she had to find various ways in through pre-existing pockets of enthusiasm, whether they were found in the school's Environmental Club or particular members of the caretaking or teaching staff. Here CA-Coord suggests the innate qualities of motivation for the program and the required leadership could be supported, but not induced. What CA-Coord describes here is sustainability as a process, rather than a product. The process continues beyond the field of schooling, having shaped what students believe in, both needing and valuing their contributions. In fact, CA-Coord feels sufficiently strongly about the essential role of students to the EcoSchools program that she suggests both the numbers of student leaders and participants ought to be taken into account if the certification process were to change.

In the fourth engagement strand excerpt below, CA-Coord expands on the means of maintaining a successful EcoSchools program, exhibiting in her response the subthemes of 'time', 'patience', 'motivation', 'action' and 'responsibility'.

Another challenge is to accept going slowly. So to know that whenever you're working on this – and you don't have to get to Gold right away – you want to do it well, and authentically. Because you need to build on that. Another challenge is continuing to monitor the progress of whatever you've implemented. Because you can start off going really like gangbusters at the beginning for a few months, and the kids are doing all these waste-free lunches. And if you don't do these informal checks, very easily it goes back. So then how do we keep the parents on board. And how do we keep the kids on board. And how do we keep it exciting and new, and what are the new and innovative challenges that we can do to keep the incentive up (CA-Coord, p. 50). So [in differentiating ESD from good practice] we need ... if it's sustainability education, which is understanding things through your social lens, and economic, and environmental, and seeing the connections between that, and framing all of your learning behind that – that's

another way of doing it. And you've got to have some common, concrete, big-picture thing that you start with (CA-Coord, p. 57).

The first challenge regarding program maintenance that CA-Coord touches on in this excerpt is taking the time and having the patience to move at an appropriate pace. The time frame is dictated by the individuals in the school, so that they can internalize the changes initiated, bringing them about through consistent behaviours. The second challenge mentioned relates to creating a system to monitor the process of change, in order to determine the extent to which the intended goals are met and kept. The third challenge relates to sustaining motivation of participants in their varied roles through the various stages of the program: its inception and the outset of goal determination, through monitoring to the revision of goals. Faced with the circumstance that the program involves more individuals and easily goes beyond the grounds of the school in both location and remit, how does the team determine what might be within their goals? What differentiates efforts by the EcoTeam from good general practice? CA-Coord addresses this fourth challenge, providing guidance for the EcoTeam as they determine the goals and the scope of their program. The guidance centres on the concept of clarifying the team's intention for the program. If the intention is to bring about a greater degree of sustainability, then all goals are imbued with this intention. Grounding the program from the outset and maintaining the program throughout its existence with the intention of sustainability is a fundamental challenge for all EcoSchools and arguably for sustainability programs generally (see Table 15 of Chapter 9).

Throughout each of the engagement strand excerpts above as well as in the fifth and final one below, CA-Coord mentions “kids”, the students participating in and leading the EcoSchools program. It is clear from her comments that the kids are not only the reason that all the program work is done and with whom it is done; they are the core, the very heart of the program. In the following excerpt, CA-Coord touches on the subthemes of ‘interconnections’, ‘thinking’,

‘leadership’ and ‘independence’ as she shares her views about the sustainability of students’ attitudes and orientations.

To me, a sustainable program is when your kids carry it on. When the kids graduate, their belief system is going to be changed towards that.... It’s seeing connections between things, and understanding that everything is connected. If I make a decision based just on economics, then it’s definitely going to have implications for the social [sphere], or for the environment. So if I wanted to have a sustainable program? Its indicators are the kids being produced at the end of it, at the end of an educational system, and how has that affected them (CA-Coord, p. 58).

The point regarding students as an indicator of a sustainability program was also made by SV-Teach2 in the previous section. At the outset of the above excerpt, CA-Coord states that a sustainable program, one that is sustained over time, is one where the students not only participate in or lead the program within the school, but where they also carry the program to a time and place beyond school. Similar points were made by CA-Teach1 in the previous chapter (Q7 discussion of thick responses) as well as in her portrait excerpts in the previous section. In order to do this, the students’ belief system, based on the quality of their thinking, will be oriented towards sustainability, with its explicit connections among the spheres of the environment, economy and society. The awareness of connections and their implications regarding action choices will then guide students. The primary indicator of success for the program will be the individuals at its heart, the students themselves. In the main research phase of this project, SV-Teach2 in Stage 5 and LT-Coord in Stage 6 were other participants who shared thoughts on this subject, stating the importance of looking to the children as key sustainability indicators.

The word map below illustrates the use that LT-Coord makes of a dozen subthemes, emphasizing three of them with the repetitive use of ‘action’, ‘responsibility’ and ‘citizen’. The

link between the connection and engagement strands is the subtheme of ‘action’, while ‘responsibility’, a primary contributor to the deep view, is a strong presence within the engagement and interpretation strand of questions, appearing in the majority of this participant’s responses. In word maps or excerpts, LT-Coord touches on three subthemes associated with the higher stages (‘thinking’, ‘independence’, ‘one person’). Two subthemes that are touched on in all three strands of question by LT-Coord are ‘action’ and ‘thinking’. His sustainability style might be described as encouraging an individual’s sense of responsibility to take action, preceded by a shift in thinking.

Figure 22. Relationship of subthemes for LT-Coord.

For the interpretation strand, the following excerpt touches on the subthemes of ‘action’, ‘responsibility’, ‘thinking’ and, first illustrated here, ‘three ESD spheres’.

For me, it is education for how you should live in this world. That is including environment, including social issues, and sustainability. It is for everyone, not

just children (LT-Coord, p. 1). Another thing is changing the view of people – how we see the world – world view. I think that is very hard to change, and it won't change easily. And I don't believe that I will see it in my lifetime. But if something will happen, like strong issues in climate change, with strong programs – then these people have more power to change and live in the world... (LT-Coord, p. 5).

In this excerpt, LT-Coord suggests a relevance of ESD to everyone, not just students or the professional educators found in schools. In defining ESD, LT-Coord emphasizes the environmental and social strands, rather than the economic one. However, he is clear that a main purpose of ESD is to shape the thinking or belief system of those it engages, not just in the realm of the school, but most particularly when confronted with the conditions found in the world itself. This excerpt ends with the hopeful statement that those individuals who have been shaped by ESD will be more enabled to successfully deal with the challenges arising from serious, intractable environmental issues, such as climate change.

The following connection strand excerpt touches on the subthemes of 'thinking', 'action', 'motivation', 'imperfect', 'leadership' and, first illustrated here, 'topophilia'.

But what I see is that people at schools ... teachers and sometimes directors – they care about the environment, even if they don't have a benefit from it. Especially no financial benefit. And the main feeling is that they do this – because they care about the environment – not to get benefits (LT-Coord, p. 19). Of course, they may want to influence children, but they do this mostly because they care about the environment.... I think ethnoculturally we are very connected to the environment.... I think this is one of the differences between us and the green movements in Western Europe (LT-Coord, p. 20). Comment on this excerpt? It is a pity that it's disappearing; that it is lost for more people, especially young people (LT-Coord, p. 25). About connection with nature ... losing connection with nature in younger generation. Sometimes it is quite hard to talk about nature because they don't know nature ... they do not feel nature, it is just virtual reality for them (LT-Coord, p. 26). Climate change will change

many things. It is one of the mechanisms of nature to balance things. Society as it is now will be destroyed; it will destroy itself. But the main means is through changing mindsets of people (LT-Coord, p. 32). It seems like I need to just move in the direction – stepping, stepping, stepping, stepping ... how I want to live (LT-Coord, p. 50).

In this excerpt, LT-Coord outlines his belief that historically the Lithuanian culture had strong connections to the natural world, perhaps setting advantageous conditions for EcoSchools and other sustainability programs in the nation, as compared to other ones in Europe. At the present moment, however, the influence of technology and the direction society has taken towards consumerism have eroded the strong connection with genuine nature for younger Lithuanians so that, today, the world depicted on computer screens is more familiar. In the view of LT-Coord, a powerful response to the erosion of connection to nature is through shifting the thinking of individuals, to change their mindsets. Actions by the younger Lithuanians then may realign with those of the older generation, with a revival to a degree of altruism for others and nature, connecting them to and supporting them in their protection of the environment. The sustainability path is a non-linear one, however, with few signposts on the way, regardless of a person's job role, background, or culture. What guidance, then, is available? To turn towards an orientation of sustainability, as LT-Coord suggests, "to just move in the direction", enables success.

The six subthemes touched on in the following engagement strand excerpt include 'leadership', 'responsibility', 'imperfect', 'action', 'integration' and, first illustrated here, 'independence'. These subthemes as well as those illustrated in the word map above show that LT-Coord is one of a cohort of participants who make use of all or almost all of the six most common engagement strand subthemes, most of which contribute to the deep view, and thereby illustrate in a clear way various aspects of sustainability engagement.

At work I am able to see and change how they care about the environment in bigger picture (LT-Coord, p. 15). Good indicator of über green school: look to the children; the quality of responsibility that they are given and what they do with that. Teachers are the necessary middle rung (LT-Coord, p. 23). Most important: to show possible solutions and options (LT-Coord, p. 35). Actually, you're going deeper than EcoSchools. No problem. But it doesn't go so deep. The EcoSchools program is just to go in a green direction (LT-Coord, p. 36). If school is sustainable, that is most important – not what we do, but how we do it. EcoSchools program just gives means for school to be more and more sustainable. As schools self-select aspect of sustainable development is actually definitively sustainable process (LT-Coord, p. 53). So one thing about good practices ... are just good practices. And education for sustainable development has a deeper meaning. And without it, good practices lack the direction – they are just good practices. But with direction, then it is education for sustainable development (LT-Coord, p. 55).

Even among schools certified to the same standard, achieving Green Flag status, there is still a large amount of variability in the program achieved. For all EcoSchools, however, LT-Coord mentions that the program is “just to go in a green direction”, as he touched on in the connection strand excerpt above. The point is for individuals to be oriented towards sustainability in a general way, focusing on the process of creating a sustainability program, rather than achieving certain specific products. A guiding principle in this is to focus on solutions to environmental problems, addressing both polarities of the problems-solutions dyad. LT-Coord points out two important aspects of an über green school: the students engaged in the program are an indicator of its success, while the differentiation between good practices and ESD is a framework for guiding sustainability efforts. CA-Coord makes very similar points, with the first point also being shared by one other participant, SV-Teach2, making the role of students as indicators an issue raised by participants in all three nations.

Five responses are analyzed for LT-Teach6's word map, one of which (Q7) is indicated within a curved question response space to allow for ease of connection between the overlapping subthemes illustrated in the ellipses of Q1 and Q8/9. Of the later-stage indicator subthemes, 'independence' and 'thinking' are present. Out of the 14 different subthemes touched on, six are repeated, the largest number among Stage 6 participants. All six of her repeated subthemes are the six most frequently cited subthemes for the engagement strand (see Table T3, Appendix T). These six subthemes include the majority of the defining subthemes for the deep view of the engagement strand (missing only 'one person'), suggesting this view to be both clearly defined and of particular importance to LT-Teach6. A point of note regarding the interview with LT-Teach6 is the unique feature that it was necessary to conduct the interview in the back of her teaching classroom during a lesson, as no other time was provided by the school. The interview, therefore, was limited to the confines of one lesson, with the teacher periodically moving between delivering the lesson and being interviewed, kindly accommodating both her professional duties and the request for an interview as the lead EcoSchools teacher for the school. In word maps or excerpts, LT-Teach6 touches on two higher stage subthemes ('thinking' and 'independence'), with two subthemes mentioned in each of the three strands of question ('action' and 'time'). Additionally, her responses in the engagement strand reveal that her focus has moved beyond theory to operationalization, where individuals' thinking shapes their sustainability priorities, including a sensitivity regarding the dimension of time.

Figure 23. Relationship of subthemes for LT-Teach6.

The interpretation strand excerpt below was used to code eight of the subthemes outlined in the word map above as indicated in the Q1 ellipse, and discussed in greater detail in the preceding chapter. In fact, for those participants included in the portraits, only LT-Teach6, CA-Coord and LT-Teach3 touched on the majority of the most frequently appearing subthemes for this strand, which were ‘action’, ‘choices’ and ‘time’ (see Appendix T, Table T1).

ESD means ecological, economic, and social development – balancing it.
 Balanced ESD nowadays is a new view in Lithuania. We’ve had ecological education before, but now have a deeper view of it, a deeper knowledge. Now looking at our daily activities and how they harm nature. Be an example to her [school] children, to her family. If you can influence children when they are young, maybe not in this time, but maybe later in their lives, they will return to it, to nature. Necessary not only to talk with children, but to do something: show them how to do it for self (LT-Teach6, p. 1).

Beyond the understanding that ESD includes a balanced view of its three spheres, this excerpt underscores LT-Teach6’s manner as a sustainability educator, with her emphasis on action over

passive theory. As well, there is a sense of stewardship for both the environment and the students in her care, moving into a time well into the future. From her interpretation of ESD, the direct links to the engagement strand are apparent. For LT-Teach6, changes are brought about first in herself and then shared within the private and public domains of family and school. Finally, students' success is supported through the process of skill development, rather than focusing on particular outcomes, with the result that they gain a sense of independence.

The excerpt for the connection strand touches on nine subthemes, including 'action', 'time', 'leadership', 'motivation', as well as, first illustrated here, 'topophilia', 'personal', 'imperfect', 'nature of change' and 'values'.

Met Laima Galkute [a leader in ESD] around 1996.... In 1998 heard environmental protection strategy. Read the 2003 Ministry of Science and Education document number 1160, sections 249–257, as they are about science in schools and ESD. Initially, saw a lot of things not done, and wanted to change things. Wanted to try to make a balance between what we do and what we know (LT-Teach6, p. 1). Lithuanians in all times – they are fighting for their Earth, their territory. Have always been connected with Earth, but nowadays, the connection is weaker. A lot of young people leave their roots and parents here. Very often don't come back. They are looking for better pay. Lithuanians are unique. Some people see the environmental threats, but not all. We have seen a lot of bad examples in Europe. We understand what we should protect, what we should do, but it is not easy to do it. She's a "real Lithuanian" [*"tikras lietuvis"*]. Can't live in town or abroad, needs nature of Lithuania around her all the time. Has an umbilical cord to the Earth (LT-Teach6, p. 3). Being a real Lithuanian comes from her parents and her situation in life; her parents left in war, but she and her siblings couldn't do that now. When Lithuanians are abroad, they would think of their land, and it's not easy for them. Couldn't live abroad because of culture shock. Now there are fewer real Lithuanians, as there are weaker connection between parents and their children. Joining the EU influenced social values. Big influence was getting independence and people becoming free. Motivation is bigger than hope (LT-Teach6, p. 4).

LT-Teach6 depicts the process of following the changes relating to ESD in her nation over the previous decade. At the outset of that decade, she met a woman who had then been writing and presenting workshops in sustainability education, and who continued as a leader in the field over the years. A number of the Lithuanian participants had attended workshops with Laima Galkute, particularly in recent years, to such an extent that the year of meeting her was almost a proxy indicator of a participant's stage. As LT-Teach6 expresses it, her interest was in moving beyond the realm of the theoretical towards taking action by engaging with the topics. In moving along the continuum of knowing what to do, making an initial effort to take appropriate action, and continuing iterations of effort, LT-Teach6 explains that it is not easy. However, a driving force for LT-Teach6 is her connection to the land of her nation and to her family circle, something that holds true for individuals she describes as being real Lithuanians. Echoing LT-Coord, she shares her belief that cultural and political economy shifts have weakened the connection to the land felt by the younger generation of Lithuanians, with a concurrent weakening of the family fabric, to the point that youth leave their homeland for reasons of economic gain. As her home is in rural Lithuania, the work she and her students do regarding nature is within the context of nature, improving the possibility of capturing the attention and hearts of her students during those moments without the influence of external value systems.

LT-Teach6 is not only one of a cohort of participants to use the largest number of subthemes in the engagement strand, she is the only one to touch on all six of the most frequently appearing subthemes for the engagement strand (see Table T3, Appendix T). This is a clear indication that engagement is of particular importance to the sustainability style for this participant. Four of the engagement strand questions are illustrated in the word map above, with the excerpt to follow touching on seven subthemes, including 'interconnections', 'action', 'motivation', 'responsibility', 'time', 'independence' and 'multiple barriers/drivers'.

Before EcoSchools these types of actions were happening in Lithuania, but only by biology teachers – now more widely involved. Make skills for future life. Motivation of teachers and students is a problem. Solution is try to wake up, show importance. Need to understand things, especially outside, beyond the school; can't separate them, they are connected.... Need outside support. Needs to be an issue that not only teachers address. Go beyond [EcoSchools] documents. We have a lot of good ideas, but limited time, energy. Very difficult to work alone (LT-Teach6, p. 4). The best thing was that we all came together into one place and we decided what we should do (LT-Teach6, p. 7).

This excerpt reveals that LT-Teach6 has a collaborative style, imbued through her statement that not only is outside support needed, but given that the issues faced within the school do not stop at the edge of its grounds, coming together to decide “what we should do” marked a considerable achievement. Aspects of the sustainability program at this school, LT-4, include moving beyond immediate products towards a process, creating skills for individuals supporting sustainability into the future. In doing so, program participants move beyond the goals of EcoSchools itself, into a more independent arena of goal-setting according to their own sustainability framework.

All questions relating to interpretation, connection and engagement strands for these three participants included thick responses, and a sense of this homogeneity is apparent in their Stage 6 portraits. As mentioned at the outset of the Stage 6 portraits, these word maps show the largest number of different subthemes, accompanied by a large number of repetitions, reflected by the word maps' size and complexity. At 11 subthemes, the Stage 6 participants had the largest number of subthemes shared amongst the three of them, eight of which contribute to the four views and detail the dynamic, long and deep views. In a way, this large number of shared subthemes may suggest a commonality of concepts, perhaps also suggesting (despite these participants' location at different schools and even in different nations) a commonality of style of approach for sustainability education, sharpening the image of a more fully developed sustainability chef. Each of the three participants makes use of between two and four of the

later-stage indicator subthemes; they also include between two and four subthemes mentioned across all three question strands. The subthemes mentioned across all three strands are: CA-Coord, ‘action’, ‘time’, ‘leadership’, ‘independence’; LT-Coord, ‘action’, ‘thinking’; LT-Teach6, ‘action’, ‘time’. The later-stage indicator subthemes mentioned are: CA-Coord, ‘thinking’ ‘independence’, ‘choices’, ‘one person’; LT-Coord, ‘thinking’, ‘one person’; LT-Teach6, ‘thinking’, ‘independence’. In each of these two categories, the subthemes of ‘action’ (across all three strands) and ‘thinking’ are shared by all three participants; these subthemes are key for the dynamic view. Additionally, they all touch on both subthemes associated with the long view (‘leadership’ and ‘topophilia’) as well as three out of four of the subthemes for the deep view (‘responsibility’, ‘independence’ and ‘motivation’). All three of these participants touch on two of the higher-stage indicator subthemes of ‘thinking’ and ‘independence’. Broadly, the participant views these individuals reveal are remarkably similar. Together, these may provide a textured glimpse into shared aspects of their sustainability orientation and style: it involves exhibited leadership and a strong sense of connection while moving beyond the theoretical towards active engagement about self-determined sustainability practices, preceded and accompanied by a shift in the quality of thinking. In the excerpts for these three participants, they showed themselves to be leaders, exhibiting aspects of these choices through their own modelling of behaviours. These shared subthemes give a strong indication of the sustainability perspectives of these participants.

Graphical Analysis of Subtheme Data for All Six Stages

To this point in the chapter, horizontal analysis has entailed the creation of portraits of each participant, with comparisons made to gain a sense of each stage. The portraits were based on word maps and excerpts, with their depiction of a participant’s use of subthemes done sequentially by strand. In this section, graphical analysis by participant and by stage is

completed to provide a visual overview of subtheme trends. The subthemes data for both of these graphs are based on the coded questions (see Appendix Y for raw data). As outlined in Appendix U, which indicates all thick responses, approximately 50% of the questions are coded. The vertical axis in both graphs, therefore, represents this coded cohort.

The following figure shows the trend of the total sum of *subthemes* for coded thick responses for each participant versus the total number of *thick responses* for that participant. Between-question replicates are included, since the questions are considered separate entities: if a given participant touches on a subtheme in two or more questions, this increases the total sum of subthemes.

Figure 24. Relationship between number of subthemes (with replication) and the number of thick responses.

The curve of best fit for the relationship illustrated in the above figure is an exponential curve, rather than a straight line, with the data being well represented; the correlation coefficient for this exponential regression is 83.9%. The figure above shows points for the 26 staged participants, excluding the Stage 1 participant (LT-Care) who lacked thick responses and the three participants (CA-Admin2, LT-Admin1, LT-Teach4) for whom the assignment of a stage was impossible due to curtailed interviews. Also imposed on this figure are outlines to indicate participants in the same stage. The points represented by the different stage cohorts indicate little overlap, barring at one point between Stage 2 and Stage 3. Note that this particular data point [3,4] reflects two Stage 2 participants (CA-Teach7 and LT-Teach1). Looking at the graph holistically, a clear gap is apparent separating Stage 6 from Stage 5 data points, reinforcing the particular coherence of Stage 6 participants' articulation of their sustainability perspectives as thoroughly developed sustainability chefs. A couple of trends are also apparent: the number of thick responses increases as the stage increases, while the total sum of subthemes increases with the number of thick responses. This second point suggests that participants have different styles of responses as their stage increases, as they include a larger number of subthemes for any given response. A final observation relates to the participants' roles. While teachers and administrators run the gamut of stages, from 2 through 6 and from 2 through 5, respectively, national coordinators are grouped at the upper end of the curve, and the one staged caretaker appears towards the lower end.

The following figure shows the average total number of subthemes versus the average number of thick responses for each stage (see Appendix Y, which is a summary of information from Appendix T, Table T4 and Appendix U, Table U1, for the raw data) for the 26 staged participants. The curve of best fit for the relationship in this figure is also an exponential curve, with the data being very well represented by this curve, yielding a correlation coefficient of 99.2%.

Figure 25. Relationship between average number of subthemes and the average number of thick responses.

Stages 2 through 6 are included in the figure above, providing a general indication of the expected number of subthemes for individuals in a given stage. For instance, for the Stage 2 participants, the figure above indicates that two thick responses would be expected for each of the Stage 2 participants, and with 50% of those coded, a yield of just less than four subthemes would arise for each thick response (actually, 3.6). The Stage 6 participants would be expected to include almost 10 thick responses (out of 10 interview questions), yielding a predicted value of 21 total subthemes with 50% of those thick responses coded. Each coded thick response would then be associated with a total number of subthemes of just over four (actually, 4.3), representing an increase of 20% over the Stage 2 results. As stage increases, not only does the number of thick responses increase, but these responses also reveal more detail. In fact, more thick responses correlate with increasingly thick responses.

The graphical results actually provide an insight into the manner of response of the participants. The three common results that might arise in the graphical analysis, zero change,

negative change or positive change, each link to a different interpretation of the response style of the participants. In the first instance of zero change, the relationship between total subthemes and thick responses would be represented in a linear relationship, with zero increase or decrease from proportionality. In this scenario, the Stage 6 participants' responses are more plentiful but not more complex or different in style from those of Stage 2 participants. In the second instance, of a decrease, the relationship suggests that the later-stage participants' responses are more plentiful but they draw on the same general pool of subthemes, and would be represented by a downward sloping curve. In the third instance, of an increase, the later-stage participants' responses are both more plentiful and more complex, and would be represented by an upward sloping curve indicating that the number of subthemes is increasing at a faster rate than the number of thick responses. This third scenario is in fact seen in Figures 23 and 24. In other words, the participants in this study reveal that their proportion of thick responses is increasing with stage number, shown through an increase in both variety of subthemes and repetition of subthemes.

Comparative Summary of Findings from Chapter 6 and 7

As has been stated, the most striking feature of comparing participants' responses across the three nations is the extent to which they parallel each other, both on individual issues and in terms of the model of sustainability perspectives and its structure. To further explore this, a selection of comparisons, sourced from the précis document material, are presented here by school or role and by stage, across two or three nations for most comparisons, although for the comparison of Stage 3 administrators it was necessary to compare within the same country (Lithuania). Each comparison is broken down by strand, together with some general remarks and an indication regarding the chapters featuring the participants' responses, where all

participants were included in Chapter 6, some were included in Chapter 7, and some will be included in Chapter 8.

Table 13

Comparisons of Schools by Stage and Role, across Nation

Key comparison factor	Nations	Stage(s)
School: <i>by participants' stage</i>	Canada, Lithuania	5

Schools compared: CA-3, LT-2

Participants compared: CA-Teach5 [Chs 6, 8], CA-Teach6 [Chs 6, 8], LT-Admin2 [Chs 6, 7, 8], LT-Teach3 [Chs 6, 7]^a

General: The two schools in this comparison exhibit a number of differences, predominantly cultural, as well as some parallels reflecting a tendency characteristic of latter-stage participants to see a bigger picture.

Interpretation: The Lithuanian participants' comments reflect infusion into curriculum significantly more than the Canadians', likely due to the more prescriptive approach to curriculum in Canada^b. Three of the four participants, across nation and role, mention aspects of future citizenship.

Connection: This comparison illustrates a cross-nation trend for teachers to identify personal factors, while the administrator takes a broader view, in this case a historical perspective, more present for Lithuanians due to the Soviet occupation. The book excerpt appears to have been particularly meaningful for the Lithuanians.

Engagement: Participants from both schools touched on job-definition issues in terms of school employees; LT-Admin2 also mentioned a dearth of shared responsibility, but more generally in society; in fact LT2 appears through the lens of program implementation to be an arguably more cohesive school than CA-3, with more explicit valuing of students and teachers. The Lithuanians focus on enabling students to be responsible problem solvers and decision makers, while the Canadians see the influence of consumer values on students as problematic, being difficult to reconcile with environmental awareness. In going beyond the program, each participant mentioned a different aspect (professional development, a practical project, theoretical enquiry, international dialogue).

School: <i>by stage profile</i>	Canada, Sweden	4, 5
---------------------------------	----------------	------

Schools compared: CA-2, SV-2

Participants compared: CA-Teach3 [Chs 6, 8; Stage 5], CA-Teach4 [Chs 6, 7, 8; Stage 4], SV-Admin2 [Chs 6, 7, 8; Stage 5], SV-Teach2 [Chs 6, 7, 8; Stage 4]

General: By comparison with Stage 4 participants, Stage 5 participants are starting to see various additional aspects, such as: solutions as well as problems; the value of bringing awareness in and of itself (CA-Teach3); the relevance of the program to staff as well as students; going beyond school grounds. Also, Stage 5 participants displayed more structural insight; for example, recognizing that adequately supporting environmental programs, and the teachers implementing them alongside regular teaching commitments, is a hard problem.

Interpretation: Stage 4 participants emphasized learning opportunities for students, while Stage 5 participants also saw broader perspectives, for example taking an ecosystems approach to teaching (modelling what you teach by how you teach), making wise choices, seeing the program as being not just for students.

Connection: All participants come from a personal history of connection. Interestingly, the Canadians cite a connection to land as a Canadian (i.e. citizenship) characteristic, although this aspect may not be seen, yet, in students new to Canada. A generational perspective appears, particularly with the Stage 4 participants. For the Swedish participants, the students are key, and relationships are critical so that students feel valued, with a stated need for a quality of teaching that is difficult to define but may be thought of as the magic synergy between a particular group of students with a particular teacher, unconnected with the curriculum. The Stage 5 participants exhibited particular thoughtfulness, for example around the need for balance or the need to unpack unobvious environmental impacts.

Engagement: The CA-2 pair show the key benefits of teamwork, particularly in teacher-teacher form, for example in overcoming resistance from administration and other departments, and even in changing board-level policy. This forms a striking comparison to SV-2 where only one teacher was involved and student participation in a successful program had almost vanished because her first program cohort had graduated, although the teacher and her administrator demonstrated a strong degree of collegiality. At CA-2, the EcoSchools program has achieved startling outreach, for example with students going into feeder schools and teaching younger students. Key factors for student involvement were identified, such as maintaining interest and overcoming the “uncool” factor. The responses of all participants suggest that EcoSchools may not be sufficiently challenging, and is more a way to get certified for what the school already does than a source of new ideas.

Note. ^a Chapters in which participant is quoted; all participants quoted in Chapter 6, some also quoted in Chapters 7 or 8 or both 7 and 8

^b More recently, sustainability topics have been infused through Ontario science curricula (Ontario Ministry of Education, 2008)

The above table illustrates comparisons by school, where the organizing factor is the stage of the participants rather than role (note that both comparisons involve three teachers and one administrator). Given the small numbers available due to the size of this study, these comparisons are definitively limited. In the first comparison involving CA-3 and LT-2, all four of these individuals are Stage 5 participants. What is of interest is that while there are overall trends in responses, given that these individuals have similar sustainability frameworks and number of thick responses, there are differences of note, some of which may be accounted for in the differences due to culture or educational systems, as touched on in the table. In the second comparison, the participants have the same stage profile, with one individual at Stage 4 and one

at Stage 5 for both schools CA-2 and SV-2. This second comparison reveals an interesting aspect of sustainability leadership at work, where the individuals at different stages work together in shaping the sustainability program in their school, whether as two teachers within the same department or as an administrator supporting one of her staff. The following table uses as the primary basis for comparison the role of the participant at a given stage, listed sequentially and involving two or three participants. An exception to this is in the role of caretaker, as there were only two involved in the study, with one at Stage 1 and the other at Stage 3.

Table 14

Comparisons of Participants by Stage and Role, across Nation

Key comparison factor	Nations	Stage(s)
Role: <i>Caretaker</i>	Lithuania, Sweden	<i>1, 3</i>
<p><i>Participants compared:</i> <i>LT-Care</i> [Ch 6], <i>SV-Care</i> [Chs 6, 7, 8] ^a</p> <p><i>General:</i> Although offering responses to questions asked, both participants were somewhat reticent in the formal interview.</p> <p><i>Interpretation:</i> Neither participant's response connected particularly to ESD.</p> <p><i>Connection:</i> <i>SV-Care</i> shows a broader perspective, particularly the long view; both clearly value a connection to nature.</p> <p><i>Engagement:</i> Both caretakers see the value of the program, and also express an awareness that current successes need to be built upon.</p>		
Role: <i>Teacher</i>	Canada, Lithuania, Sweden	<i>2</i>
<p><i>Participants compared:</i> <i>CA-Teach7</i> [Chs 6, 7, 8], <i>LT-Teach1</i> [Chs 6, 7], <i>SV-Teach1</i> [Ch 6]</p> <p><i>General:</i> A single-issue focus is apparent, although the issue varies among participants.</p> <p><i>Interpretation:</i> No real distinction was made by the participants between general education practice and ESD.</p> <p><i>Connection:</i> The participants expressed some carefully considered responses reflecting multiple perspectives. <i>CA-Teach7</i> appears to be thinking in terms of student motivation being a teacher's job, while <i>LT-Teach1</i> aims for student self-motivation.</p> <p><i>Engagement:</i> Different foci are apparent among the participants in a generally thin set of responses. <i>CA-Teach7</i> is focused on conservation, in a relatively restricted sense, but she does extend these activities beyond the school; she sees ESD as very difficult to infuse through the curriculum. <i>LT-Teach1</i> is personally active environmentally, but feels school accomplishments are limited by extremely limited funds regarding educational resources. <i>SV-Teach1</i> is curriculum-oriented; a major limitation is the school's special needs nature, so that implementation is limited in scope and especially in the time dimension.</p>		

Role: <i>Administrator</i>	Lithuania [both LT-3]	3
Participants compared: LT-Admin3 [Chs 6, 7], LT-Admin4 [Ch 6]		
General: A characteristic administrator-style overview is apparent in both participants.		
Interpretation: Only LT-Admin4 responded, citing the need to preserve nature, but without specifics.		
Connection: Both participants' responses reflect a perceptive approach, showing diverse and/or big-picture perspectives.		
Engagement: In both sets of responses the scope of action can be seen beginning to broaden toward non-proximal time and space, for example through municipality or regional involvement. Both express the importance of valuing and supporting good teachers and of sharing best practices, which appears as a specifically Lithuanian focus; they also see a broadening range of practical challenges.		
Role: <i>Administrator</i>	Lithuania, Sweden	4
Participants compared: LT-Admin5 [Ch 6], SV-Admin2 [Chs 6, 7, 8]		
General: These two participants, from different nations, exhibit almost identical thin/thick patterns of responses across the ten questions. ^b LT-Admin5 shows the emergence of some characteristics for higher stages; for example, recognizing not only the three spheres of ESD but the interconnections among them and/or the need for them to be in balance. The broader administrator perspective is again apparent.		
Interpretation: LT-Admin5 appears to express a wider view than SV-Admin2, citing the three spheres of ESD and advocating for ESD as part of every child's education from its outset, although both see the potential to enable a shift in students' thinking.		
Connection: LT-Admin5 comments on Lithuania's unique societal issues flowing from the impact of Soviet occupation on Lithuanian traditions, but goes on to say that maintaining these traditions is even harder now in the face of consumerism, another destructive force. SV-Admin2's responses bring out ideas such as thinking generationally and encouraging students to take the lead.		
Engagement: Both administrators are focused on school activities, particularly (though for LT-Admin5 not exclusively) conservation. LT-Admin5 is beginning to see beyond the school context, into community and societal dimensions, but without a fully articulated vision.		
Role: <i>Teacher</i>	Canada, Lithuania, Sweden	5
Participants compared: CA-Teach1 [Chs 6, 7, 8], LT-Teach3 [Chs 6, 7], SV-Teach2 [Chs 6, 7, 8]		
General: All three participants have thick responses for each of Q1–Q5, but a divergence appears in the response pattern for Q6–Q10. CA-Teach1, in particular, reflects multilayered answers and diverse elements in her thinking.		
Interpretation: SV-Teach2 and CA-Teach1 focus on students as thoughtful, informed and engaged future citizens, while LT-Teach3 brings in historical and whole-curriculum perspectives.		
Connection: All three participants, from the three nations, express a strong personal connection to land as part of their identity. There is also a common understanding regarding both the necessity and the difficulty of maintaining hopefulness.		
Engagement: CA-Teach1 sees well beyond the program, but all three participants appreciate their role in influencing and valuing students. In particular, CA-Teach1 and LT-Teach3 see students' own uptake of engaged leadership as a key program success factor.		

Role: <i>Coordinator</i>	Canada, Lithuania	6
Participants compared: CA-Coord [Chs 6, 7, 8], LT-Coord [Chs 6, 7, 8]		
General: These coordinators share a strong focus on the core role of thinking in ESD. Some significant differences expressed in terms of job roles are likely due to a greater degree of openness to the program in Lithuania, whereas much of CA-Coord's efforts were devoted to supporting its adoption by schools and educators in the TDSB. Both have a diversity of response throughout all ten questions and, in particular, a richly developed view of citizenship.		
Interpretation: Both coordinators identify all three spheres of ESD and the necessity for deep societal change. Both identify graduated students carrying environmental values and behaviours into citizenship, not just as desirable, but as a key ESD indicator – this being a form of Stage 6 indicator in itself.		
Connection: Both coordinators identify a spiritual dimension to connection with nature and touch on an urban/rural values tension. Both focus on the key role of a cognitive shift and are realistic about the obstacles. For CA-Coord, leading by example and empowering students to create their own success are key aspects of sustainability learning.		
Engagement: To a large extent, both coordinators are focused on overall sustainability practice rather than specific program goals. There is a common emphasis on fostering and valuing students' leadership. Both coordinators see conservation activities, while important in themselves, primarily as vehicles for developing leadership skills and sustainability values. Both express the necessity of seeking broad adoption of the program and describe obstacles to this. CA-Coord again identifies the students carrying the program forward as a key success indicator.		

Note. ^a Chapters in which participant is quoted; all participants quoted in Chapter 6, some also quoted in Chapters 7 or 8 or both 7 and 8

^b See Appendix U for a full tabulation of participants' thick and thin responses

The table above makes use of the data available to compare at a given stage individuals in the same role in different nations. One of the features apparent is that different aspects of individuals' sustainability frameworks actually appear at different stages, rather than early stages being a form of a scaled-down version of the later stages. While each stage reveals a degree of diversity in response and approach to sustainability learning, aspects of collegiality can be sensed through the responses. In an imagined scenario where these individuals were to collaborate across national boundaries, the result would undoubtedly be interesting and successful.

Conclusion

Chapter 6 was the basis for a discussion of vertical analysis, looking at response cohorts for each of the ten interview questions for all 30 participants. Chapter 7 has provided a detailed horizontal analysis, looking at portraits of the three question strand responses for each of the 16

participants sampled within the five stages (2–6) that include one or more thick responses.

Trends appeared, differentiating the style of each of these five stages in both word maps and the responses from the strand excerpts. In fact, the tracking of changes within the word maps is a means of tracking the changes that appear within the excerpts in a manner facilitating comparison.

The two fundamental trends apparent on initial observation of the word maps relate to their size and complexity. Regarding size of word maps, those of the Stage 2 participants all included one ellipse, representing the average of one thick coded response. The number of ellipses in the word maps increased by one for each increase of stage, on average, so that the Stage 6 participants all included five ellipses. There are a number of trends that changed with increasing stages. Within each word map, the total number of subthemes increased exponentially, revealing an increase in variety and repetition of subthemes for each participant with increasing stage. Stage 3 showed the beginning of repetition, with one subtheme repeated. This increased to two different subthemes repeated by a given participant in Stage 4; up to four different subthemes repeated in Stage 5; up to six different subthemes repeated in Stage 6 (see Appendix Z for a more detailed description of these trends). The number of subthemes that a participant mentioned across all three strands was zero for Stages 2–4; up to two in Stage 5; and up to four in Stage 6. The number of subthemes from the cohort of four indicator subthemes for later stages was zero for Stages 2 and 3; up to three in Stage 4; and up to four in both Stages 5 and 6. The number of the repeated subthemes that contribute to the views was zero for Stage 2; one for Stage 3; two for Stage 4; and seven for each of Stages 5 and 6. The number of subthemes shared by all participants in a given stage indicated in word maps and excerpts in this chapter was between two and six for Stages 2 through 5, but it was 11 in Stage 6. This is a significant increase and suggests a common conceptual vocabulary for the Stage 6 participants. Another point of interest is that of these subthemes shared by individuals in a given stage,

between one and four subthemes relate to the subset of 10 subthemes that make up participants' views for Stages 2 through 5, but for Stage 6 participants, there were eight such subthemes. Again, this suggests that the Stage 6 participants' views strongly reflect each other, as detailed in Chapter 8.

The excerpts included in the portraits for each of the 16 participants link to the word maps but also separately reveal points of interest. Of note are the appearance of particular subthemes that contribute to participants' views, either separately or in conjunction with others. The long view, associated with the connection strand of questions, appeared first and is touched on by participants at the outset of the appearance of thick responses in this stand, in Stage 2. The indicator subthemes for the long view are 'topophilia' and 'leadership'. Aspects of the deep view began to appear in Stage 3, with the indicator subthemes of 'responsibility' and 'motivation'. Stages 4–6 included the later-stage indicator subthemes of 'independence', 'one person', 'choices' and 'thinking'. The first two of these completed the foundation of the deep view, with 'choices' contributing to the wide view and 'thinking' contributing to the dynamic view, all of which will be expanded on in the next chapter.

Chapter 8:

Analysis of Views

Introduction

This chapter is the fourth in the series of results chapters, each one with a particular primary focus. Chapter 5 provided an overview of the results, including the details of the six stages involved in the proposed model of sustainability perspectives. Chapter 6 provided a vertical analysis of thin and thick responses to the ten interview questions. Chapter 7 provided portraits of participants through a horizontal analysis of the five stages that include one or more thick responses. In unpacking an individual's sustainability framework, a key question arises regarding the perspectives made available to the individual by that framework. In analyzing these perspectives, regularities became apparent in the form of four views that emerged from the pattern of subthemes and responses. The primary focus of Chapter 8 is to provide details of the use of subthemes by participants in each of the three strands in order to gain insight into these four views.

There were ten subthemes, indicated in this chapter in single quotation marks for ease of recognition, that contributed to the views. These subthemes were deemed to be those that have what is termed the strongest "presence of occurrence" as they appear in the ten interview questions, as well as those touched on with the greatest frequency by participants as summed in different question responses, termed "frequency of use". An example of the difference between these two terms can be seen in Appendix W, which shows the subthemes referenced by the 16 participants used for the portraits of the previous chapter. For instance, the first participant listed, CA-Coord, made use of nine of the ten subthemes and so the majority of the subthemes have a presence of occurrence for this participant; when including various replications, this number increases to 14 in total, due to increased frequency of use for some of those subthemes.

For six of these participants there was no replication of subthemes, so the number is the same in columns for both the total number of subthemes and with replications. The most important feature of the views, however, does not lie in the particular method of their determination nor even their exact composition. Rather, as is illustrated at the end of this chapter, a significant quality of the views is the manner in which the portfolio of views contributes to a larger perspective on sustainability.

Arising of the Views

Although a sense of the views was gained from an early stage of interview transcription and data analysis, it was not until matrix-based methods were pursued that the views could be outlined in a substantive way. The present chapter shows the detail involved in their determination, which at times may appear like the pointillism of an impressionist's painting. A different and equally valid stance from a greater distance has the effect of smoothing the data. In pointillistic art, the qualities of the image perceived from a distance are very much determined by the detail of the methodology. Taken on their own, the individual marks of paint may appear unremarkable as they may seem to lack a more cohesive pattern or purpose; this situation may appear to arise here as well. This chapter may be seen as a form of meta-analysis, providing both details of the content of the four views of long, wide, deep, and dynamic, as well as a brief outline of a larger perspective of how they work together.

The analysis for the views outlined in Appendix X shows the overall pattern of subtheme occurrence by both question and strand. The ten "particular subthemes" listed at the bottom of this table indicate the subthemes that arose in conjunction with one question only. Four of these are associated with the interpretation strand, three with the connection strand, and three with the engagement strand. Although these particular subthemes give rise to insights regarding both the

vertical and horizontal analysis, they are not part of the analysis of this chapter since they are neither strong in presence of occurrence nor high in frequency of use.

The 18 “common subthemes” that occur in two or more of the ten interview questions are shown in rank order of their occurrence. The number of replications of each is also shown. There are ten subthemes that are touched on in the majority (6 or more) of the questions. For the first six of these subthemes, the ranking of occurrence and replicates both follow the same order. As shown in Figure 26 to follow and as listed in the tables of Appendix T, these six subthemes are highlighted pink and referred to as “primary, secondary and tertiary overall subthemes” reflecting the degree of their presence, as shown in Appendix X. A point to note regards the subtheme ‘one person’, which appears in Appendix X above ‘motivation’, due to the fact that ‘one person’ is included in more questions than ‘motivation’, although ‘one person’ has fewer repetitions. In fact, ‘one person’ makes its first appearance in the word maps of Stage 5, and as it can be taken as an indicator of a later-stage participant, it is understandable that it might be underrepresented in replicates.

Determining which of these ten subthemes, or any of the other “common subthemes”, aligned with any given question strand was determined via the tables of Appendix T. ‘Action’ and ‘time’ are two subthemes that appear at the top of the list of subthemes throughout Appendix T, appearing in virtually all (19 out of 20 instances) in the ten interview questions, shown in Appendix X. The subthemes used as key indicators for each question strand are therefore any outside of these two. As stated on the tables themselves, the colour pink indicates a subtheme that is applicable across the three strands (such as ‘action’, ‘time’, ‘thinking’); blue indicates a subtheme associated with the interpretation strand (‘choices’); yellow indicates a subtheme associated with the connection strand (‘topophilia’); green indicates subthemes associated with the engagement strand (‘one person’, ‘motivation’), with three subthemes indicated in both pink

and green or pink and yellow due to their respective type of dominance ('responsibility', 'independence'; 'leadership').

As the summary for the interpretation strand, Table T1 Appendix T shows that the most frequently used subtheme in this strand is 'choices'. Appendix X shows that 'choices' is highlighted as the key indicator subtheme for the interpretation strand due to its dominance in Appendix T, and yet this subtheme does not appear at all in the context of the engagement strand. As 'choices' is the subtheme associated with the wide view, the wide view therefore features most prominently in the interpretation strand, secondarily in the connection strand, and not at all in the engagement strand of questions. This is an interesting if counterintuitive finding, to see that the wide view involving 'choices' does not relate to the engagement strand of questions, which have as their focus the options available to create a successful program.

For the connection strand, Table T2 of Appendix T shows that for this strand out of the three, 'time' is touched on more frequently than 'action', with 'topophilia' being the other dominant subtheme for this strand. As indicated in Appendix X, 'topophilia' appears exclusively in association with the connection strand. Appendix X also shows that the only other subtheme to appear in relation to each of the connection strand questions is 'leadership', making this the second key indicator subtheme associated with the connection strand, indicated through pink and yellow highlighting (see Table T2, Appendix T and Appendix X). Interestingly, 'topophilia' appears neither in the interpretation nor the engagement strand of questions, and so is strongly associated with the long view. The interpretation and engagement strands do not, therefore, express the long view fully; this view being fully characterized through the subthemes of 'leadership' and 'topophilia' associated with the connection strand of questions.

For the engagement strand, Table T3 of Appendix T shows that 'responsibility', 'independence' and 'motivation' are the three dominant subthemes for the engagement strand according to frequency of replicates. Appendix X shows that two subthemes are associated with

all five of the engagement strand questions: ‘responsibility’ and ‘one person’. Of these four views which contribute to the deep view, half of them (‘motivation’ and ‘one person’) are absent from the interpretation strand. All four of these subthemes are referred to in both the connection and engagement strands, featuring significantly more prominently in the engagement strand, with which the view is associated.

Finally, the subtheme of ‘thinking’ appears in the top six most dominant subthemes overall, touched on in seven out of the ten questions, as indicated through pink highlighting in Appendices T and X. It is associated with three questions in both connection and engagement strands as well as the interpretation strand, therefore not appearing in association with one strand in preference to another. ‘Thinking’ can be seen to be referred to strongly in all three strands of questions. As such, it is considered to be associated with all three strands and may be seen as indicating a background view, which will be elaborated in a later section. In addition to the top ten most common subthemes mentioned above, a point to note is that although ‘consequences’ and ‘interconnections’ are not associated with the views as the top ten subthemes are, they appear with some frequency across the ten interview questions (see Table T4). As such, they are not included in the views explicitly, but will arise in the context of excerpts illustrating the views in the sections to follow.

The figure below is a visual representation of the dominance of each of these subthemes, whether in each of the three strands (indicated in the colours blue, yellow or green above the line listing the subthemes), or when considering the interview questions overall (indicated in the pink below).

Figure 26. Subtheme profiles by strand.

Note that the pink pattern, showing the primary, secondary and tertiary subthemes for questions overall, is the same regardless of the strand. These central subthemes are the first six subthemes and are listed in the same order, due to their ranking overall, as shown in Appendix X. The cross-hatching shown in the connection and engagement strands indicate those subthemes ('leadership', 'responsibility' and 'one person') that were touched on in each of the strand questions. Out of the six central subthemes, 'action' is dominant in both the strand and overall rankings for all three strands, with 'time' also being of primary dominance in the connection

strand, and ‘responsibility’ also being of primary dominance in the engagement strand. There are four subthemes that appear only in association with a given strand, namely ‘choices’ for the interpretation strand, ‘topophilia’ for the connection strand, and ‘motivation’ and ‘one person’ for the engagement strand, while ‘leadership’ occurs in every connection question. ‘Independence’ appears frequently in association with the engagement strand. The subtheme of ‘thinking’ is touched on as one of the six most dominant subthemes across all three strands, but not in special relation to a given strand.

The figure below is a different depiction of the way that these ten subthemes relate to one another.

Note. Subthemes in **BOLD CAPITALS** appear in all questions and are dominant in replicates; subthemes with an ***asterisk** are associated with higher stages (4–6); subthemes in *italics* appear in every question for a strand; underlined subthemes have the greatest number of replications for a strand, after Action and Time.

Figure 27. Relationship of subthemes within the four views.

Significantly, ‘choices’ and ‘thinking’ are associated with the higher stages, and as they are the only key indicator subthemes for the wide and dynamic views, these views emerge exclusively from the participants in Stages 4–6. The long view and deep view both have two subthemes that appear from Stage 2 and so these views might be shared by participants in any of the stages with one or more thick responses. Intuitively, one might entertain the possibility of all four views being present in each stage, with only the extent to which the view is present varying. However, this need not be the case, much as, by way of analogy, one would not expect any form of Piagetian formal operations to be present in an infant. To put it another way, while a sapling may have a trunk and leaves, only the mature tree bears fruit. Thus, while a participant at any stage will certainly have realized some of the traits of a sustainability chef, it is in the latter stages of the model of sustainability perspectives that one may expect to see a full range of such characteristics expressed. Similarly, while two of the views emerge at Stage 2, consideration of Figure 27 in the light of the relationship between the model of sustainability perspectives and the strands suggests that other views may well not be seen until later stages.

The rest of this chapter will be devoted to excerpts that illuminate the four views of participants themselves, as well as connections to related research. In these excerpts, all stages with one or more thick responses (not Stage 1) are represented, along with each of the job roles, nations and schools. Responses from 19 different participants were included in the context of each of the ten interview questions. About half (13) of the two dozen excerpts used here were included in neither Chapter 6 nor Chapter 7, with the remainder being excerpts that were used in only one of the two previous chapters. The views as glimpsed in previous chapters are therefore here illuminated with additional ‘new’ excerpts. While the ten subthemes associated with the four views and illustrated in the figure above are most frequently cited, other subthemes do appear in various extracts.

The main purpose of the links to related research is to show the use of the various top ten subthemes contributing to the views in a context external to this dissertation. For instance, a subtheme such as ‘motivation’ will be illustrated, on its own or in combination with other subthemes, as it appears in the literature of the field, rather than as part of a longer exposition on the development of theories of motivation. These connections will be introduced before the participant excerpts, with the majority found in combination of two or more subthemes. Depending on which subthemes are used, this may mean that two or more views are touched on within one quote. However, there are instances where one subtheme is touched on. For the subtheme of ‘time’, which is relevant to all four views, the links to the literature appear at this point, before the more detailed discussion of each of the four views. Excerpts from significant international documents generated within and beyond the United Nations system illustrate the prevalence of the subtheme of ‘time’. The *Earth Charter*, which states 16 principles relating to four sections, includes in Section 1, Principle 4: “Secure Earth’s bounty and beauty for present and future generations” (Earth Charter International, 2000, p. 2). Also, the Rio Declaration on Environment and Development stated “Principle 3: The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations” (UN, 1992, Annex I). Also relevant to all four views is how ‘time’ interacts with ‘action’. Of the eight guiding principles of environmental education programs mentioned in the Belgrade Charter, an outcome document from the 1975 Belgrade Working Conference on Environmental Education, three explicitly refer to ‘action’ and ‘time’: “2. Environmental education should be a continuous life-long process, both in-school and out-of-school; ... 4. Environmental education should emphasize active participation in preventing and solving environmental problems; ... 6. Environmental education should focus on current and future environmental situations” (UNESCO/UNEP, 1975, p. 4). In an epilogue to the collaborative 1969 article “The concept of environmental education”, William Stapp touched on both ‘time’

and ‘action’ as he stated that the focus for environmental education “should reside mainly in the initiative of the learners and their involvement in action and guided by both the immediate and future subjects of concern” (Stapp et al., 1997, p. 36).

Although these quotes consider the issue of time in the present and future only, the concept of time in the historic past is touched on in others’ work, as will be seen below. Note that subthemes may be associated with a word or a phrase that relates to them. For instance, ‘time’ is the subtheme, whereas the published phrase is “present and future generations”. Similarly, ‘action’ is the subtheme relating to the phrase “active participation” as well as the explicit term “action” in the above excerpts. In such a way will each of the subthemes be illustrated in association with a word or phrase.

The Long View: Focus on Topophilia and Leadership

The long view, in which a sense of beyond-proximal time and space develops, relates to the connection strand and includes the two key indicator subthemes of ‘topophilia’ and ‘leadership’, in addition to ‘time’ and ‘action’.

Literature and the long view

The literature is replete with relevant quotes illustrating either of the two key subthemes individually. For instance, when defining topophilia, Tuan suggests that it can be considered “broadly to include all of the human being’s affective ties with the material environment” (Tuan, 1974, p. 93) which may be primarily aesthetic or tactile. However, “More permanent and less easy to express are feelings that one has toward a place because it is home, the locus of memories, and the means of gaining a livelihood” (Tuan, 1974, p. 93). Examples of the reference to topophilia include the 1988 work by Jonathan Porritt and David Winner, *The Coming of the Greens*, which was quoted by Greig, Pike and Selby as a joyful expression of topophilia: “In order to be at home in the world, we must be fully of it, experiencing it directly

as mud between our toes, as the rough bark on a tree, as the song of the world awakening every morning” (Greig, Pike & Selby, 1989, p. 11). Equally relevant, Stephen Kellert quotes a 1993 publication by Robert Pyle in which he uses the phrase “the extinction of experience” when describing the reduction of direct contact with nature.

Direct, personal contact with living things affects us in vital ways that vicarious experience can never replace. I believe that one of the greatest causes of the ecological crisis is the state of personal alienation from nature in which many [children] live. We lack a widespread sense of intimacy with the living world.... The extinction of experience ... implies a cycle of disaffection that can have disastrous consequences (Kellert, 2005, p. 84).

To illustrate the use of two subthemes associated with the long view, Louise Chawla explicitly mentions ‘leadership’ and ‘action’, in stating that “Environmental educators need not only to understand how to prepare people for a general level of environmental citizenship but also to produce leaders who can mobilize others to take action” (Chawla, 1999, p. 25). In a 2003 publication, Derek Hodson touches on three of the subthemes associated with this view, covering ‘action’, ‘topophilia’, and ‘time’. He makes use of longer scales for both time and distance, concepts associated with this view, addressing topophilia explicitly in the following excerpt:

Some years ago, Woolnough and Allsop (1985) talked about the importance of students “getting a feel for phenomena” through hands-on experiences in the laboratory as a prerequisite for conceptual understanding. What I am advocating here is “getting a feel for the environment” – building a sense of ecological relationships through powerful emotional experiences “in the field”. The key emphases are: sharpening the senses; building key ecological concepts – not just as analytical abstractions but as tools for seeing and understanding; providing opportunities for solitude; making learning a joyful and magical experience. We should aim to give all students the opportunity to experience the silence and majesty of the forest, mountains and seashore (Hodson, 2003, p. 664).

Here Hodson sketches some of the important skills and aspects of topophilia. In the following excerpt the subtheme ‘topophilia’ is more implicit, while ‘action’ and ‘time’ come to the foreground:

...that we live in a global village, and that what we do in our own backyard can impact quite significantly on people living elsewhere in the world. What is also true is that our actions now impact on the lives of future citizens.... It is not too

much of an exaggeration to say that the degree to which young citizens incorporate sustainable practices in their professional and personal lives will determine the quality of life for future generations (Hodson, 2003, pp. 662–663).

Hodson touches on different spatial scales at Level 4 of his issues-based approach: “Some of the issues addressed through this curriculum will be global (ozone depletion, acid rain, global warming), some will be local (factory-based pollution, road construction, loss of recreational space), but the common element should be *sustainability*” (emphasis in the original; Hodson, 2003, p. 658).

Participants and the long view

For participants in this study, the long view emerges from the outset of stages including one or more thick response, from Stage 2, where ‘topophilia’ and ‘leadership’ first appear. This situation also holds true with the deep view, discussed later. In the following eight excerpts, there is only one instance where indicator subthemes associated with other views are touched on, suggesting little overlap with the other views. However, as will be shown later, examples from published literature depict subthemes associated with the long view in conjunction with ‘thinking’, the key subtheme of the dynamic view. Regarding the participants in this study, there are six instances where ‘time’ is touched on in conjunction with the key indicator subthemes for this view. Although not a key indicator subtheme for the long view, in four of these instances ‘interconnections’ is also touched on; in three of which, ‘time’ and ‘interconnections’ occur together. The conjunction of ‘time’ and ‘interconnections’ may have greater meaning. The sense of time referred to in the context of these excerpts covers the whole continuum of time, from the historic through the present moment and into the future. If, as suggested in Chapter 6, the conjunction of the subtheme of ‘topophilia’ with ‘interconnections’ suggests a bidirectional understanding between self and love of place and implies a beyond-proximal appreciation of space, then the juxtaposition with ‘time’ might further suggest its relevance beyond proximal time. The addition of the subtheme ‘leadership’ then brings in the concept of what individuals

might do, given an understanding of the linkages between non-proximal space/time and the value of protecting the environment. These qualities of the long view strongly suggest that it is a foundational perspective element for a sustainability chef.

In the following new excerpt presented for the first time here relating to Q3, CA-Coord touches on both of the subthemes of ‘topophilia’ and ‘interconnections’.

Just by seeing the Earth itself ... how could you not think there was a Maker?
Being among the Red Woods in California, seeing massive trees and all sorts of
nature growing together – just unbelievable. In the city, unless you go camp,
you’re not surrounded by nature, it’s easy to overlook, to take for granted (CA-
Coord, p. 28).

In this excerpt, CA-Coord (a Stage 6 participant) gives an insight into the degree of topophilia she experiences and the feelings it engenders. A passage shared by CA-Teach7 (a Stage 2 participant) echoes these comments, and was used to illustrate both Q3 in Chapter 6 and the connection strand in Chapter 7. Both participants’ excerpts give insight into the long view and show that this view encompasses the full range of thick response stages, from 2 through 6. In both cases, these participants link their love of place to their understanding of God or a Maker. For some individuals, as expressed by these participants, love of place touches on a spiritual experience through the sensory response to being in nature or through some understanding that the world around us might have been shaped by something beyond ourselves. Parsing whether the impetus to protect the natural world springs from an appreciation of it, from a sense that nature is evidence of a Creator, or from a sense that we are a part of it matters less for the purposes of this discussion than the fact that motivation to protect nature follows on from a connection to nature.

Another point that is raised in both of these excerpts is the fact that this sense of connection may occur within an urban environment. In the excerpt from CA-Teach7, she mentions that her sense of connection is experienced just through sitting in the backyard to

meditate, “to see the trees, to see the wind blowing” (CA-Teach7, p. 12). CA-Coord points out that although the sense of connection is stronger in a place of natural beauty, and easier to overlook in a city, yet it is possible to experience it in an urban setting. The significance of this is that the majority of the world’s population no longer lives in rural settings, as was the case for almost all of human history up until the 21st century. In fact, it was in 2008 that the shift from a rural to an urban majority was made, according to the United Nations (n.d.). If a sense of connection to nature is a precursor to action fostering a sustainable future, then it is important to find means that it be fostered within urban as well as rural settings. Excursions to nature and camp experiences for youth might unveil the full magnitude of topophilia for an individual, but fostering a daily appreciation of evidence of nature around us even in an urban setting is essential and more readily achievable for the demographics of Earth’s current population.

In the following two excerpts ‘topophilia’, one of the key indicator subthemes for the long view, is touched on, but in conjunction with ‘time’ in both cases. In this excerpt from CA-Teach1, which was included in relation to Q2 in Chapter 6, three other subthemes are manifested as well: ‘personal’, ‘multiple impetus’ and ‘interconnections’.

I think it was the big wave of Earth Day resurgence in 1990. I was a student in high school ... the issues were treated seriously by the high school I attended.... We were speaking earlier about topophilia and learning about the environment through your family, having the experience of being in the woods or being at the farm. And I was really lucky, I always considered what I had – one foot in the city, one foot in the country. So that was just having come from the type of family I’ve come from.... We still go harvest food off the land, and we have that connection. I still fish. I know where my food comes from.... So that was luckily thanks to my family, so it would have been the people that influenced me in my early life (CA-Teach1, p. 3).

In this excerpt, CA-Teach1 suggests that her childhood exposure to both urban and rural settings was a lucky instance and a factor leading to her experience of topophilia. The bidirectional

characteristic possible within the long view is apparent here, given that in appreciating the nature around her, CA-Teach1 considers both what her impact may be and the benefits that accrue to her from it. In this excerpt, there is a sense of topophilia developing over a period of time, as is reflected in the new excerpt below from LT-Admin2 relating to Q3, where he touches on ‘topophilia’ in conjunction with ‘time’ as well.

We are connected with the land.... Each of us is a country person, and there must be a connection to nature, and they are enduring (LT-Admin2, p. 7).

The emphatic statement regarding topophilia used by this administrator is then underscored in his second statement by using the imperative. The excerpt comes to an end with the sense that this connection is timeless, existing in the past and having the capacity to exist well into the future. Although there was a short period when this administrator was interviewed in the room while his colleagues at LT-2 were both present (LT-Teach3 and LT-Teach4), the excerpt above was shared at a time that did not overlap with exchanges from either of these teachers. Even so, aspects of this style of long view are shared with LT-Teach4, as will be shown below.

The following new excerpt relates to Q5, and is an example of a key indicator subtheme for all four views appearing in one excerpt. In addition to others, LT-Teach2 touches on the subtheme of ‘leadership’ associated with the long view, in addition to ‘choices’, ‘independence’ and ‘thinking’, each of which are indicator subthemes for the wide, deep, and dynamic views respectively.

At first we have to start with ourselves – if I don’t throw rubbish outside, then I won’t let pupils do that. We have to show pupils through concrete examples. And they can make some conclusions of it. When the problem does not touch individuals, they don’t see anything (LT-Teach2, p. 3).

The aspect of the long view touched on here relates to the quality of leadership, described here as starting with, yet expanding from ourselves. As an educator, her circle of influence would

include students as well as other individuals. The manner in which leadership is shown is through ensuring that environmental problems have solutions that are relevant to the lives of individuals. At that point, others might be encouraged to unpack available choices, thinking about options independently, for themselves. This excerpt therefore outlines the layers involved in the nature of change and how it might be brought about, beginning with the self and one's leadership skills.

The following two excerpts both address the two indicator subthemes for the long view of 'topophilia' and 'leadership' as well as the subtheme of 'time'. In the following excerpt by LT-Teach4, the first part relates to Q3 and appeared in Chapter 6, but the second part relates to Q4 and is a new excerpt. This excerpt was shared in the interview before her colleague, LT-Admin2 arrived in the interview room, and yet the connection to place and an expanded sense of time is common to both participants. Here, the subthemes touched on are 'topophilia', 'leadership', 'time' and 'action'.

She believes that everywhere it's the same – ultimately the Earth remains. If people forget about it, then they will get reminded. She thinks we are obliged to protect nature. She is very close to nature, lakes and forests, goes outside. The most important thing is the family – how the family gives the example of looking after nature (LT-Teach4, p. 4). Give example through the life of family and through teachers. When we go on excursions, how to behave in the forests. By lived example, by taking students to nature (LT-Teach4, p. 5).

In the opening statement of this excerpt, LT-Teach4 comments on the universality of the topophilia aspect of the long view, just as CA-Teach7 did in her response to the same question (see discussion of Q3, Chapter 6) by stating: "It's not a Canadian thing, it's a human characteristic" (CA-Teach7, p. 13). However, LT-Teach4 also links 'topophilia' to 'time' in a way that goes beyond the ordinary reference to this dimension, emphasizing its enduring nature.

LT-Teach4 also describes the quality of leadership as beginning with the lived, rather than theoretical, example of the individual, expanding to the teacher's circle of influence including the family, and then to students and others. The explicit importance of the family was stated by a number of other participants, yet arises most frequently in Lithuania. Notably, the family was also mentioned by LT-Teach6 in the context of both the interpretation and connection strand excerpts in Chapter 7, with both of these excerpts touching on the subtheme of 'leadership'. She stated both the importance of being "an example to her [school] children, to her family" (LT-Teach6, p. 1), and the significance of ties between parents and children (LT-Teach6, p. 4). The pair of Swedish colleagues from SV-2 were shown in Chapter 7 to touch on two aspects of the subtheme of 'leadership' raised by LT-Teach4 and LT-Teach6, in that they illuminate the importance of the lived example and of communication ties between individuals. For instance, SV-Admin2 mentions the importance of "Good teachers. They have to show how they live, that they have to be ... the pupils have to believe them" (SV-Admin2, p. 11). Her colleague, SV-Teach2 states: "The teacher must be able to interest the pupils, and I think you have to have this connection to the pupils and they see, hopefully they see us as role models" (SV-Teach2, p. 11). Leadership, then, begins with changes in the self and moves out from that hub. However, there is an interesting point of contrast between these Lithuanian and Swedish educators. In the case of the Lithuanian teachers, there is a layer between the private self and the professional efforts with students that includes the family and is seen as an essential ingredient. When this is lost, individuals are more easily influenced by consumer values, further from a sustainable future and the values of topophilia associated with the "real Lithuanian" [*tikras lietuvis*"].

In the following excerpt, LT-Teach5 touches on the same four subthemes ('topophilia', 'leadership', 'time', and 'action') that LT-Teach4 did above, as well as the subtheme of

‘interconnections’. This excerpt appeared in Chapter 7, as part of the connection strand discussion.

Whoever we are, we are united by the Earth and ecological problems. To maintain our life functions, we eat, breathe and get fresh or polluted through the process. Solving ecological problems is very important. Lithuania may historically have been connected with the land, but as time goes on, this bond is being lost.... We must return to nature and preserve it (LT-Teach5, p. 3).

LT-Teach5 here speaks to the universality of aspects of the long view in a manner similar to that of LT-Teach4, as discussed above. The comment of her opening statement in this excerpt is a reminder that the value of a connection to the Earth is inclusive by nature. Although some cultures, such as that traditionally found in Lithuania, may be predisposed to an increased awareness of the impact of a connection to the Earth, its relevance transfers across cultural or geopolitical boundaries. A striking validation of this idea is the intense feeling of connection often reported by astronauts upon seeing the Earth without such boundaries. From space, the life of the planet is vividly displayed in bands of colour; and while human settlements are visible as an integrated aspect of planetary life, national borders are not. The above excerpt also emphasizes the interconnections among the web of life, through acknowledging that individuals rely on other parts of the whole for survival, and if those parts are polluted, then the individuals will become polluted as well. The benefits of preserving nature and solving ecological problems therefore accrue directly to individuals. This sentiment was also raised by CA-Admin1, as she pointed out (see discussion relating to Q3, Chapter 6):

To get the best possible life for yourself, if you were thinking *purely* selfishly, you would have to do something about the environment. If you have a streak of altruism in yourself, and you’re thinking about others, you still have to do something for the environment (CA-Admin1, p. 6).

Both of the following two excerpts bring out the key indicator subtheme for the long view of ‘topophilia’ as well as ‘time’. In addition, the new excerpt below, given by LT-Teach7 in response to Q3, touches on both ‘interconnections’ and ‘time’.

We have no time to notice things, because we have more important things ... our jobs. It is necessary – to know hard work. Sometimes we should feel the pleasure of the smell and taste of snow and of being dirty... (LT-Teach7, p. 2). Our modern life has big effects on their development, because our children don’t like being in nature, for example cycling, or spending time in the forests. They only like playing with computers. They don’t see this connection with nature and with the Earth, because of our modern life (LT-Teach7, p. 3).

In this excerpt, LT-Teach7 gives voice to the problem that even though aspects of a connection to nature might be available, at present the younger generation struggles to see the connection in large part due to the diversions provided by a modern life and the effects of consumerist values, a point also touched on by SV-Care in the excerpt below. Other participants also address the negative effects of consumerism, technology or the effects of a modern life on disconnecting individuals from nature. In particular, LT-Coord shares this perspective, stating that “...[we are] losing connection with nature in younger generation. Sometimes it is quite hard to talk about nature because they don’t know nature ... they do not feel nature, it is just virtual reality for them” (LT-Coord, p. 26). Given these circumstances, what is an astute way of working with youth who are so disconnected? Some insight is shared in the excerpt below, which was included in the connection strand portrait of SV-Care in Chapter 7, and touches on the subthemes of ‘topophilia’, ‘time’, ‘citizen’ and ‘values’.

We are rooted to the Earth. In the Western world we are big consumers and a lot of humanity doesn’t profit as we do. We need to take time and need to make whatever... (SV-Care, p. 3).

Here SV-Care states the importance of taking time, in the present moment, to support a connection with the Earth and a liveable future. The use of the subtheme of ‘time’ to emphasize the importance of things happening only in the present moment, such as noticing, smelling, tasting things, was also used by LT-Teach7 in her excerpt above. In the short excerpt just above, LT-Coord also references sensory awareness in the phrase “feel nature”. All three of these participants suggest that a response to disconnection is through the senses themselves, engaging individuals in the world around them, a point made by Jon Kabat-Zinn in his 2005 book, *Coming to Our Senses: Healing Ourselves and the World Through Mindfulness*.

...we can learn from purposefully according some attention to the natural world, which beckons to us and offers itself to us through all our senses simultaneously, a world in which our very senses were fashioned and honed, and in which we have been seamlessly embedded from the beginning (Kabat-Zinn, 2005, p. 190).

The Wide View: Focus on Choices

The wide view, in which the scope of awareness broadens, relates to the interpretation strand of questions and has as its key indicator the subtheme of ‘choices’, which is one of the four subthemes (also including ‘independence’, ‘one person’ and ‘thinking’) that appear in Stages 4 or 5 onward. As such, these subthemes may be termed higher-stage indicator subthemes.

Literature and the wide view

An example of where ‘choices’ arises in the literature appears in Chapter 36 of *Agenda 21*, in a discussion regarding the basis for action in reorienting education towards sustainable development. In the following excerpt, the word used is “assess” rather than “choose”, but the intention is of a similar provenance.

Both formal education and non-formal education are indispensable to changing people’s attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with

sustainable development and for effective public participation in decision-making (UNCED, 1992, Chapter 36, p. 1).

Five years after *Agenda 21* appeared, which was a significant outcome publication from the Earth Summit in Rio in 1992, UNESCO published *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action*, as a preparatory document in the month prior to the Thessaloniki conference in December, 1997. In their discussion of what changes sustainability requires, the authors point to the fact that knowledge of the natural sciences and ecology are necessary but not sufficient, and stress the importance of the role of discerning decision making, or choices. “Learning about the interactions of ecological processes would then be associated with market forces, cultural values, equitable decision making, government action and the environmental impacts of human activities in a holistic interdependent manner” (UNESCO, 1997c, p. 24). The subtheme ‘choices’ can be seen in conjunction with ‘action’ in this excerpt from the Ahmedabad Declaration:

The example we set is all important. Through our actions, we add substance and vigour to the quest for sustainable living. With creativity and imagination we need to re-think and change the values we live by, the choices we make, and the actions we take (UNESCO/UNEP, 2007, p. 1).

Examples from the literature of overlap between the wide and dynamic views will be illustrated in the context of the discussion for the latter view.

Participants and the wide view

In the four participant excerpts used in this section to illustrate the wide view, ‘choices’ appears in conjunction with the subtheme of ‘thinking’ three times, suggesting an overlap in the wide and dynamic views, an occurrence that similarly appears in the presentation of excerpts in the separate discussion below regarding the dynamic view. As shown in Appendix X, ‘choices’ does not arise in response to any of the questions within the engagement strand, leaving little opportunity for overlap between the deep and wide views from the participants of this study. Overlap between the deep and wide views occurs only when a deep view indicator subtheme

such as ‘responsibility’ appears in conjunction with ‘choices’ in relation to Q1 of the interpretation strand, as happens in the third excerpt illustrating the wide view below. In contrast, Appendix X shows that ‘thinking’ appears in response to three questions in each of the connection and engagement strands as well as the interpretation strand. As an infusing subtheme in all three question strands, the subtheme of ‘thinking’ appears in relation to all four views.

In the following excerpt, which first appeared in relation to the interpretation strand component of her portrait in Chapter 7, CA-Admin1 touches on the subthemes of ‘choices’, ‘thinking’ and ‘time’.

I would also add that if [the students] value the lifestyle they have now, they are encouraged to reflect upon what it is that has provided that lifestyle, and what they can do given the resources that we have that provide for that lifestyle, to make sure that they maintain those resources into the future.... A more thoughtful stewardship perhaps, of what we have at our disposal (CA-Admin1, p. 1).

In this excerpt, ‘thinking’ and ‘choices’ are touched on in conjunction with ‘time’, providing a perspective that the implications of the choices made in the present moment will resonate in helpful or harmful ways into the future, thereby increasing the value of careful consideration regarding those choices. The students at this school are encouraged to reflect and think in a way that is not prescribed, but rather promotes the linking of concepts that may not ordinarily be juxtaposed. For many citizens in our culture, the train of thought that relates to lifestyle often centres around what individuals want, and what is required in financial terms to create that lifestyle. Here, CA-Admin1 is suggesting that students go beyond narrowly focused thinking, realizing that everything relating to a chosen lifestyle is sourced from a planet governed by finite, degradable, limits. Becoming informed regarding the lifestyle back-story is one aspect of sustainability education. Becoming more skilled at out-of-the-box thinking (captured in the “General Cognition” section of Table 16 in the next chapter) is a large part of sustainability

itself, and an important characteristic of being a sustainability chef, since such lateral thinking supports successful problem-solving given unpredictable future circumstances. A significant point regarding the overlap between the wide and dynamic views is their support of individuals into an unknown, unknowable future. A great advantage is gained by realizing that choices must inevitably be made, yet the quality of those choices might be improved through thinking and reflection. The conjunction of ‘choices’ and ‘thinking’ might induce adaptability to circumstances of chaos required when faced with a future in flux, as brought about by the strong influence of conditions such as climate change.

The following excerpt, which first appeared in relation to the Q1 discussion in Chapter 6, touches on the subtheme of ‘choices’ as well as the subthemes of ‘action’, ‘interconnections’, ‘consequences’, ‘imperfect’, ‘appropriate action’ and ‘daily actions’. Although the subtheme of ‘thinking’ does not explicitly appear, the subtheme of ‘consequences’ which is included explicitly in this excerpt does suggest a degree of thoughtfulness regarding the repercussions of chosen actions.

I think we try to do that ecosystem approach: that everything affects everything else. So they’re never going to make perfect choices, but.... Every time they do something, to stop and ask themselves, “What are going to be the consequences of this”.... And sometimes it’s just bringing awareness to it – do you leave your tap running when you brush your teeth? Certainly in the senior grades, we’re looking more on a global scale. If you’re wasting water, how does this compare to some of the countries in Africa, where you had to walk for an hour to get your water, what would you be doing. So I think in the junior grades it’s more their individual actions, and in the senior grades, it’s more looking at a global scale (CA-Teach3, p. 1).

One aspect touched on in this excerpt is that of a shifting perspective over time, with this educator suggesting that there might be an age- or grade-appropriate scale regarding the problem-solution dyad. Here, she suggests that the junior and senior grades’ experience of the

dyad would differ along a continuum of space, with the junior students' focus on the proximal issues and the senior students focusing on the non-proximal. Others have suggested similar age-appropriate considerations be given to the exposure of students to the severity or extent of environmental problems, particularly if this happens in advance of developing a sense of connection with the environment. Regardless of the age of the student, there is an impetus for an individual to take action given the understanding of a utility for that action: that even small actions have a measurable effect on some scale, and that it is not too late to take action. These sentiments were shared by CA-Admin1 in her response to Q5: "And we try not to talk about it as *a fait accompli*, and so if I say to students, 'How can you make a difference', that suggests that there is room for change, because you wouldn't be able to make a difference if it was already too late" (CA-Admin1, p. 5). Both of these educators share the belief that individuals have the ability to act within their sphere of influence, and as CA-Teach3 suggested, the understanding of the extent of this sphere shifts over time. A counterintuitive point to note is that having understood the full extent of our influence, which may move far beyond proximal time and space as detailed in the long view, the fundamental reality is that any individual only has the ability to change *themselves* through a shift in their own choices. The key instrument of change, then, is the individual.

Both of the following new excerpts address four of the same subthemes, namely 'choices', 'thinking', 'action' and 'time'. In the following excerpt in response to Q1, CA-Teach6 also touches on the subtheme of 'responsibility' and in so doing, raises the key indicator subthemes for three of the views: wide, deep and dynamic.

Sustainability education has to do with getting away from the lifestyle decisions we've been making in the past, not knowing what it's going to cause, and to realize that for pupils, that they need to have a paradigm shift, and they need to help the rest of us have a paradigm shift so that we don't have this destruction and chaos at the end of the line – that there will be a future (CA-Teach6, p.1).

In the other instance where ‘responsibility’ appears in conjunction with ‘choices’, ‘thinking’ is also touched on, thereby providing an example of the overlap not just between the wide and deep views, but the dynamic view as well. This is found within the discussion relating to the dynamic view below, by the colleague of this educator, CA-Teach5. In both cases, these participants suggest that individuals have a responsibility to do certain things and that this responsibility is not only shared with others but the manner in which it is to be carried out would take repercussions into consideration. This excerpt clarifies the responsibility of the individual to both self and community and in some way might give an insight into the sustainability style at this school, CA-3, which independently of the EcoSchools program has embraced an ethos of sustainability.

In the new excerpt to follow relating to Q1, SV-Coord references ‘choices’, ‘thinking’, ‘time’ and ‘action’.

To give the pupils positive thoughts about the future and that they can make a difference by their own action and influence individually. To take action to change the world for the better. To make good choices for the future. To have a negative view of the future I think is very bad and that you could not do anything to change it. It’s all about “could” (SV-Coord, p. 10).

Woven throughout the sentences of this excerpt are a number of comments that emphasize possibilities available to individuals, such as “positive thoughts”, “can make a difference”, “for the better”, “all about could”. Although framed in these terms, SV-Coord’s comments touch on the same concept of hope that CA-Teach1 and CA-Coord stated explicitly, arising for both participants in the context of the connection strand discussion of their Chapter 7 portraits. In fact, the Canadian coordinator used some of the same phrases as the Swedish coordinator regarding efforts to “make a difference”. However, whereas SV-Coord’s comments centred around thinking that this was possible, CA-Coord focused on means to make this a reality. CA-Coord stated: “So if we can empower our kids to see a problem in the school – in our own local,

immediate place, and empower them, and give them a chance to make a difference – then we’re going to give them hope for the future” (CA-Coord, p. 32). Both of these national coordinators exude the belief that a difference can still be made, an attitude that is also shared by CA-Admin1 above. In some ways believing in the possibility of being able to make a difference, of still having time to make a difference, is the essential ingredient in the overlap between the wide and dynamic view’s subthemes of ‘choices’ and ‘thinking’. This attitude goes beyond optimism, towards an openness of mind buoyed by hope that enables individuals to practice solutions-based approaches even when faced with what may appear to be a limitless supply of complex environmental problems.

The Deep View: Focus on Responsibility, Motivation, Independence and One Person

The key indicator subthemes comprising the deep view of the engagement strand, in which self-awareness deepens in relation to environmental questions, are ‘responsibility’, ‘motivation’, ‘independence’ and ‘one person’. Whereas the first two of these subthemes emerge in participants’ excerpts from Stage 2 onwards, the second two emerge in excerpts from Stages 4 through 6. Among the 29 participants with one or more thick responses, there is no instance when all four of these subthemes appear together in a single excerpt.

Literature and the deep view

The following are instances where each of these four subthemes appear on their own in the literature. An example for ‘responsibility’ appears in writing by the British environmental educator, George C. Martin. He touched on a differentiated environmental education program from 1972 for primary and secondary schools, where for the primary school students, the environment would “give opportunities for making discoveries at first hand. This approach should lead in turn to the development of an awareness of personal environmental responsibilities” (Martin, 1975, p. 26). Abraham Maslow’s work, which began more than 60

years ago, on motivation with self-actualized individuals has been widely discussed within and beyond the academy and includes core concepts such as his hierarchy of needs, peak experiences, and metamotivation. Maslow parses metamotivation from a more general sense of motivation for those individuals who have had their basic needs met and are able to more fully realize their potential and contribute to society. He defines metamotivation as: “Self-actualizing individuals (more matured, more fully human), by definition, already suitably gratified in their basic needs, are now motivated in other higher ways, to be called ‘metamotivations’” (Maslow, 1971, p. 299). Maslow’s use of metamotivation is, in fact, used with a similar intention as the subtheme of ‘motivation’ in this study, since participants speak of being motivated to respond to an environmental issue, often going beyond the scope of meeting that individual’s basic daily needs.

Research in the field of environmentally responsible behaviours (ERB) touches on the subtheme ‘motivation’ in conjunction with ‘action’. For instance, Osbaldiston and Sheldon note that

The results of this study support our assumption that internalized (or self-determined) motivation can promote sustained environmental behavior change.... Participants who felt self-determined in their motivations seemed to enter an “upward spiral” of positive change, in that they were then more likely to perform well, which in turn tended to promote intentions to keep on behaving after the study’s conclusion. In contrast, those lacking in internalized motivation showed little movement towards more ERB (Osbaldiston & Sheldon, 2003, p. 354).

Rebekka Darner’s 2007 doctoral thesis made use of self-determination theory to explore environmental motivation. This was followed up with *Self-Determination Theory as a Guide to Fostering Environmental Motivation*, where she touches on ‘motivation’, ‘action’ and ‘time’:

if environmental educators want students to perform proenvironmental behaviors on a long-term basis, remaining unswayed by the various barriers against acting proenvironmentally, those educators should try to support students’ development of self-determined motivation toward proenvironmental behaviors.... Generally, self-determination is greater when people’s basic psychological needs [competence, autonomy, and relatedness] are supported (Darner, 2009, p. 45).

The subthemes of ‘responsibility’ and ‘motivation’ appear in the literature in combination. For instance, *Agenda 21* notes: “There is a need to increase public sensitivity to environment and development problems and involvement in their solutions and foster a sense of personal environmental responsibility and greater motivation and commitment towards sustainable development” (UNCED, 1992, Chapter 36, p. 4). The final report for the Tbilisi Conference also touches on ‘motivation’, ‘responsibility’ as well as ‘action’:

Appropriate action requires a solid base of sound information and technical skills. But action also depends upon motivation, which depends upon widespread understanding and that, in turn, depends upon education. What is required is continuing educative action so that all strata of society everywhere become aware of their responsibilities to do what they can to help (UNESCO, 1978, p. 61).

An example of the subtheme ‘independence’ can be seen, in its essence of autonomy, in a 1999 publication by Søren Breiting and Finn Mogensen which was quoted by Michael Bonnett. They describe a new generation of environmental education in which “engagement has to be local and communal and because there are so many unknowns, teachers/learners must have the autonomy to identify and decide issues in the light of local contingent circumstances” (Bonnett, 2000, p. 597). The subtheme of ‘one person’ appears in the Earth Charter’s *EC+10 Celebrations Report*: “It starts with one!” (Earth Charter International, 2011, p. 1). This is an echo of the short film, *The Power of One*, created by the Earth Communications Office, which combines both ‘one person’ and ‘action’ subthemes, as seen in the following transcript excerpt from the film:

The Power of One. Not so long ago, a little girl in Alabama wanted to go to the same school as everyone else. And a gentle man from India wanted to raise consciousness without raising his voice. In East Germany, a man wanted to break free. And a woman travelled the world, giving hope to those who had none. This is the Power of One. To protect your home in the Amazon. To prevent poaching of the African mountain gorilla. To rescue harp seals in Finland. Or to care for the environment in our own backyard. The Power of One is the power to do something. Anything. (<http://www.oneearth.org/>)

Both ‘independence’ and ‘one person’ are later-stage indicator subthemes, so that the autonomy identified by Breiting and Mogensen or the strong conviction that ‘one person’ makes a difference will be identified in those individuals in the latter stages, as seen in the following section.

Participants and the deep view

Similar to the long view, two subthemes of the deep view (‘responsibility’ and ‘motivation’) appear first in Stage 2, so that these views are shared by participants in all five stages with one or more thick responses. Among the six excerpts illustrating the deep view, only two touch on another view’s key indicator subtheme (‘thinking’ and ‘leadership’), suggesting that there is little overlap between the deep view and the other views, a point made in the wide view discussion above. Within the following excerpts, there are two instances where three key engagement strand subthemes are touched on together, with one further instance of three key engagement strand subthemes appearing in the context of the dynamic view excerpts. In all three of these instances, two subthemes appear together, that of ‘responsibility’ and of ‘one person’. As Appendix X shows, in addition to ‘action’, these two subthemes are the only ones to appear in relation to every engagement strand question. Out of the six excerpts to follow, ‘motivation’ appears in four of them, always in association with ‘responsibility’, but in one instance in association with ‘one person’ as well. ‘Independence’ is touched on in three of the six excerpts, twice in conjunction with ‘one person’. The appearance of these subthemes in these combinations provides insight into the deep view: ‘responsibility’ is shared among others, ‘one person’ is sufficient to make a difference, ‘motivation’ is required to act, and there exists an ability to respond with ‘independence’, beyond usual prescriptions.

The following excerpt, first appearing in relation to the Q9 discussion in Chapter 6, touches on the subthemes of ‘thinking’, ‘responsibility’, ‘independence’, ‘one person’ and ‘action’.

That every person in the school is thinking about sustainability, and is showing it through their action, and is able to articulate their understanding of it. But it's got to go beyond that ... it moves beyond, to the families, to the community (CA-Coord, p. 55).

The conjunction of the subthemes of 'thinking' and 'independence' in this excerpt suggests the former is a precursor to the latter. For an individual to express their own understanding of sustainability, they would unpack it and make it their own through the process of thinking. A characteristic of sustainability, and of a sustainability chef, is the individual's skillful interpretation of the concept given the particular conditions they face. The manner of putting sustainability into practice would be determined by the individual yet at the interface of the various communities of which they are a member, such as personal or professional spheres, including family members, students and colleagues. The self, then, is the hub and source of change, moving from the individual to others in the communities around them, a point relevant to both wide and deep views. CA-Coord touches on the importance of the families as a link in the chain, echoing comments by some of the Lithuanian teachers such as LT-Teach4 and LT-Teach6, as discussed above.

The following new excerpt by CA-Admin1 is composed of two parts, in response to Q6 and Q8. It touches on the subthemes of 'responsibility', 'one person', 'environmental literacy', 'time', 'motivation', 'multiple barriers/drivers' and 'action'.

I think the goals of the EcoSchool program are to increase environmental awareness in kids and teachers.... To help kids and teachers see that they too can make a difference, and what are the little individual things that you do to either off-set the use of paper or to minimize the footprint, if you will, of the school (CA-Admin1, p. 8). But the biggest barriers [are the] people who do not want to get involved or get on board, "I don't have time to do this" (CA-Admin1, p. 10).

Three of the key indicators for the deep view are touched on in this excerpt. They come together to underscore the importance of an individual working with others in their community to realize sustainability goals, regardless of their size. The precursor subtheme in this case would be ‘motivation’, before ‘one person’ might take ‘action’. How to foster motivation, or the impetus behind action, is an issue raised by other participants. For instance, in the context of the engagement strand component of her portrait in the previous chapter, CA-Teach4 shared that “If they don’t believe in it to begin with, it’s hard to convince them” (CA-Teach4, p. 2). Learning cannot be coerced, and neither can authentic action towards a sustainable future.

The following three excerpts continue to explore the conjunction of ‘responsibility’ and ‘motivation’; the most common combination of subthemes within the deep view and one that provides insight into its meaning. In the first excerpt, shared by CA-Teach7 in relation to Q7 and used within this participant’s Chapter 7 portrait, she touches on the subthemes of ‘action’, ‘motivation’ and ‘responsibility’.

And our seasonal clean-up ... we clean the school grounds. Twice a year – autumn and spring. Twice a year we do a “community clean-up” – we call it, because we don’t just go into the school, we go into the plaza across from the school. Challenges? Again, number one challenge is to keep the kids motivated – it is difficult when they feel they are the cleaners, the garbage-pickers, and not more than that. To keep them on board, to keep them excited, to keep them enthusiastic about what they are doing. That is the biggest challenge. Because they then have to get the other kids on board (CA-Teach7, p. 15).

Here CA-Teach7 clearly states that motivation is the primary problem and without a solution there would be no EcoSchools program in this school. Part of her role as the lead teacher at this school might be to find the ways and means to spark the necessary excitement and enthusiasm. In the context of her engagement strand portrait in Chapter 7, CA-Coord also touched on the problem of sustaining motivation, stating, “...what are the new and innovative challenges that

we can do to keep the incentive up” (CA-Coord, p. 50). Whether tackling an old problem in a new way, or approaching a fresh challenge, these participants suggest that the inner impetus of the individual drives sustainability action.

In the new excerpt below, LT-Admin1 shares his view that fostering motivation is but one of the barriers to a successful EcoSchools program. His response to Q8 touches on the subthemes of ‘motivation’, ‘responsibility’, ‘values’ and ‘multiple barriers/drivers’.

One of problems are teachers – they are not paid for this work. Hard to find volunteers (LT-Admin1, p. 21). Director is proud of such people, and he supports teachers in these projects as much as he can, because he understands that enthusiasm is not fake. If school is new, fresh school enthusiasm, fresh ideas may be easier. Older school and teachers harder to change (LT-Admin1, p. 22). Indifference a big problem as can’t only teach students at school. They are taught at home, on streets, by friends. A lot depends on parents’ attitude to ecology problems. Bad influence from Western countries – students accept very easily – drugs, litter (LT-Admin1, p. 23). It’s important that you know the students individually, so that you can find the way into their inside world (LT-Admin1, p. 24).

LT-Admin1 touches on the point of fostering authentic enthusiasm in the members of the school community through two different means. One arises within the school itself, where enthusiasm might emerge more easily given the circumstances of being part of a fresh venture such as a new school. The other arises through interpersonal connections, where educators have a responsibility to find the means to ignite enthusiasm in others, particularly in their students. Although not every teacher would have the means of finding a way into others’ inside worlds, LT-Admin1 gives voices to the value of creating a strong link between individuals. Even so, gaining sufficient motivation to initiate and sustain action is but the point of embarkation for addressing the challenges involved in creating a more liveable future. The responsibility of seeing the process through of shaping a liveable future is shared by individuals and entities less

directly connected to the school, including friends and family, as well as foreign cultural norms as portrayed in the media.

LT-Teach6 also touches on the subthemes of ‘motivation’ and ‘responsibility’ as well as ‘action’ in the following new excerpt shared in relation to Q9.

Goal is to get results that are seen. Will continue with the program as long as the whole school wants it (LT-Teach6, p. 5).

Although this statement was made by the lead teacher of the EcoSchools program in this school, she clearly states here the requirement of the collaborative nature of the program. While personally engaged in sustainability issues, the emphasis appears to be on the wishes of the whole school, considering others’ views in a democratic sense. Again the subtheme of ‘responsibility’ touches on both aspects of being responsible to carry something out, as well as sharing responsibility with others. Motivation makes an appearance as an entity that presently exists, yet might change at some point in the future, requiring a commensurate change in response from engaged individuals.

The following excerpt, used to illustrate Q8 in Chapter 6, touches on two subthemes of the deep view, ‘responsibility’ and ‘independence’, and one of the long view, ‘leadership’, as well as ‘multiple barriers/drivers’.

Often they have some problems with that [goal of 25% organic food in the canteen], because we haven’t so many local food supplies, because the students want something.... [And] it’s quite expensive, organic food, in Sweden. They have this as a goal, but one of the big things that is difficult to buy is milk for schools. Because students drink a lot of milk, so one of the most important things is to get organic milk. And we have organic milk, but not in these big containers.... It’s a very practical problem. But you have to have those big containers.... The problem is that the milk supplier [Arla] won’t.... It’s a larger [company] – national ... it’s international even. Now [our town] community has

talked about this, and if we go together with other schools, and demand this big milk container, we can do it (SV-Teach2, p. 2).

‘Responsibility’ as shared in this excerpt would start with the educator but very quickly becomes an authentic responsibility of the students, as well as branching out beyond their school into the larger community. SV-Teach2 shares how the students have set themselves a goal beyond anything required within the EcoSchools program. This is a quality of defining the program goals for themselves given the unique conditions they face and appears exclusively in the later-stage participants, associated with the subtheme of ‘independence’. These two subthemes of the deep view interact with the subtheme of ‘leadership’ associated with the long view to provide insight into both the why and how a sustainable future might be fostered.

The Dynamic View: Focus on Thinking

The key indicator subtheme for the dynamic view, encompassing a shift to process-oriented, whole-system perspectives, is ‘thinking’, which is an indicator of the latter stages as it starts to appear in the excerpts of participants at Stage 4 and onwards. This view is relevant to all three strands, as its key indicator subtheme appears in responses to seven out of the ten interview questions, as seen in Appendix X.

Literature and the dynamic view

Evidence of the importance of the role of thinking within the field of sustainability learning abounds. For instance, a key outcome of Bright and Tarrant’s 2002 study is “Our finding that EE increased students’ complexity of thinking” (Bright & Tarrant, 2002, p. 18). Derek Hodson touched on the subtheme ‘thinking’ when he said: “Environmental problems are not problems ‘out there’ in our surroundings, but problems ‘in here’ (in our heads), in the way we choose to make sense of the world” (Hodson, 2003, p. 661). Rebekka Darner described the different ways that thinking contributed to the solution of environmental problems: “Namely,

one's ability to conceptualize one's personal role in systems that contribute to environmental problems is paramount to feeling competent when solving environmental problems.

Additionally, one's ability to reason about changing environments contributes to one's feelings of competence" (Darner, 2007, pp. 226–227). An example of the subthemes 'thinking' and 'time' occurs in the following excerpt from John Foster, as he describes sustainable development to be "a process of improving the human condition which can be continued indefinitely, without undermining itself" which is done through "a livingly responsive, adaptively self-adjusting order of shared sense" (Foster, 2005, p. 125). Each of these authors have begun to touch on the larger issue of sustainability cognition, which certainly involves thinking.

The subtheme 'thinking' of the dynamic view can be seen to overlap with the subthemes of other views. For instance, the overlap of the wide and dynamic views can be detected through the arising of 'choices' and 'thinking' in the following excerpt by McKeown and Hopkins:

"Education for sustainable development, like EE, assists people to rethink their behaviors toward the environment so they may become better stewards of the environment if they so choose"

(McKeown & Hopkins, 2005, p. 222). The long and dynamic views can be seen in their overlap in the work of Michael Bonnett, touching on 'thinking' and 'topophilia' as he suggests:

our relationship with nature, whatever its kind, is an important aspect of our own identity – and thus of our self-knowledge. The way we regard and treat nature – the whole which sustains us and of which we are a part – says a lot about the sort of beings we are as well as the sort of beings we regard everything else to be (Bonnett, 2002a, p. 14).

In her 1959 article, Edith Cobb also touches on 'thinking' and 'topophilia' as she relates that an individual described

his discovery in early childhood of the sense of "Itness" as an integration with the ongoing process in nature. The position achieved by the child in this experience of "psychological equipoise" became a stabilizing influence, a life-long goal, and also the basis of a highly skillful method of observing and learning (Cobb, 1959, p. 546).

In an echo of Cobb more than half a century later, Richard Louv, in *The Nature Principle*, shares a similar bonding with a site in New Mexico:

Twenty-four years later, I often think about the cottonwood at the river's edge, and similar moments of inexplicable wonder, times when I received from nature just what I needed: an elusive *it* for which I have no name. We have thought about moving to New Mexico ever since. Or rural Vermont. But we are reminded daily that *it* also occurs where we already live – and even within the densest cities, where the urban wild still exists in the most unexpected places. It can be restored or even created where we live, work, and play (emphasis in the original; Louv, 2011, p. 2).

Louv makes the significant point that the quality of thinking and of connecting to the environment can happen in an urban setting, where he now lives, as well as in those pristine natural sites. In fact, *Itness* may be found at any place sentience is possible.

Cobb's interest in the childhood recollections of experienced nature by creative thinkers reveal that they have "a source which they describe as the experience of emerging not only into the light of consciousness but into a living sense of a dynamic relationship with the outer world ... a renewal of relationship with nature as process" (Cobb, 1959, p. 539). Juxtaposing Cobb's insight with the statement by Federico and her colleagues regarding the importance of "the ability to be a catalytic and participatory leader" (Federico et al., 2003, p. 10123), it is possible, and also relevant to the discussion, to gain greater understanding into two extraordinary musical talents. Anglo-American BBC correspondent Alistair Cooke related the compositional approach of Duke Ellington at a specially organized session, while Sir Ken Robinson described the work of Miles Davis in *The Element*, his investigation of human creativity. These excerpts reveal the dynamic view in action, where creativity comes to the forefront in the hands of a skilled leader thinking differently about the work at hand.

Cooke's description was written in tribute in *The Americans* on 31 May, 1974, the week of Duke Ellington's memorial service. At the very end of World War II, Cooke made an

appointment to see the Duke. He describes the reasons for his interest in how the music was embedded in the process of its creation:

I had come to suggest that he might like to record a long session with his band for the BBC ... [which might allow listeners] somehow to be, and feel, present at the act of creation when it was happening to the Duke standing in front of the band in rehearsal.... Alone among jazz composers, the Duke's raw material was the tune, scribbled bridge passages, a sketch in his head of the progression of solos and ensembles he wanted to hear, and an instinctive knowledge of the rich and original talents, and strengths and perversities, of his players.... Ellington had created a weird, compact, entirely personal sound with his band (Cooke, 1980, pp. 138–139).

Cooke captures the quality of working with the material at hand that the Duke found in these musicians, rather than working to a recipe.

He agreed [to the suggestion], and we had a long and unforgettable session, in a hired studio on Fifth Avenue, where we recorded the whole process of the number dictated, the roughest run-through, with many pauses, trying this fusion of instruments and that, stopping and starting and transferring the obligato from one man to another, the Duke talking and shouting, “Now, Tricky, four bars!” and “Barney, in there eight.” And in the last hour, what had been a taste in the Duke's head came out as a harmonious, rich meal (Cooke, 1980, p. 139).

The fluidity and spontaneity of the dynamic system is captured in Cooke's depiction of the scene.

In a similar manner, Sir Ken Robinson reveals the means by which Miles Davis created *Kind of Blue*, where the role of leadership in association with a creative conception of methodology allowed for the emergence of a landmark album. Robinson describes creative teams as “collections of people with similar interests who create something much greater than any of them could create individually – who become more than the sum of the parts” (Robinson, 2009, p. 123). The original liner notes to the album quote pianist Bill Evans sharing that

Miles conceived these settings only hours before the recording dates and arrived with sketches which indicated to the group what was to be played. Therefore, you will hear something close to pure spontaneity in these performances. The group had never played these pieces prior to the recordings and I think without exception the first complete performance of each was a “take” (Robinson, 2009, p. 124).

When the musicians gathered in the studio in 1959, Miles

laid out the scales – itself somewhat revolutionary, since jazz at the time was traditionally built around chord changes – and turned on the tape recorder.... The music they created in those next few hours – working with each other, playing off each other, synchronizing with each other, challenging each other – would last several lifetimes. *Kind of Blue* is the best-selling jazz album of all time and, nearly fifty years later, still sells thousands of copies every week (Robinson, 2009, p. 125).

The excerpts of the working sessions for both Duke Ellington and Miles Davis reveal an intentional self-liberation from standard approaches and are evidence of a chef-like desire to work off-recipe in a setting where the materials to hand become not only the themes and sketches but also the synergistic sum of the group's musical ideas and talents.

Robinson, who writes about and speaks frequently on the importance of the role of creativity in education (Robinson, 2009, 2011), suggests that “You can think of creativity as a conversation between what we’re trying to figure out and the media we are using” (Robinson, 2009, p. 75). These two accounts provided by Cooke and Robinson regarding musical talent in action obviously involve a very different medium than those used by most sustainability educators. However, essential characteristics are shared in the sense of working with what is to hand, responding to conditions, and of shaping something never seen before through leadership, synergy and a different style of thinking about the task. Each of these is a transferable quality and may be seen in the responses of participants in the following section. Significantly, qualities described in this section are often core aspects to being a more fully developed sustainability chef, an important aspect of which is sustainability cognition.

Participants and the dynamic view

Tables S1–S10 of Appendix S and Table T4 of Appendix T show that there are seven participants whose comments address the ‘thinking’ subtheme once in their word maps, two of whom touch on this subtheme twice, while none do so more than twice. As shown in Appendices S and X, there are three questions for which ‘thinking’ is not touched on by any

participants (Q3, Q6, Q8), three questions where only one participant cites ‘thinking’ (Q2, Q4, Q10), and four questions where between two and four participants touch on ‘thinking’ (Q1, Q5, Q7, Q9). Although ‘thinking’ arises in Q5 (connection strand) and Q7 (engagement strand) most frequently, this distribution shows broadly equal involvement in all three strands of questions, which is one reason that this subtheme is considered to indicate a background view, supporting all three other views.

There is strong overlap between this view and the other three views, as evidenced in the illustrating excerpts below. Among participants’ responses to the ten interview questions, there is no instance where the indicator subthemes for all four views are touched on within a particular excerpt. However, among the six excerpts presented below, four touch on the key indicator subthemes for three views within one excerpt. In this way, the long and wide views are each involved twice and the deep view is involved all six times. For the views (long and deep) with two or more indicator subthemes, only ‘leadership’ is involved in the long view in these excerpts and for the deep view, ‘independence’ appears four times, ‘responsibility’ three times and ‘one person’ once. Of the ten indicator subthemes illustrated in Figure 27, only ‘topophilia’ and ‘motivation’ do not appear in the following excerpts. In the excerpts for this section illustrating the dynamic view where ‘thinking’ is present, each time the indicator subtheme ‘choices’ for the wide view is present, so also is one specific indicator subtheme for the deep view, ‘independence’. All three of these subthemes are indicators of a later-stage participant. In fact, when considering all of the excerpts included in this chapter, there are 11 instances where ‘thinking’ arises, with ‘independence’ and ‘choices’ arising six times each. Other key indicator subthemes are touched on to a lesser degree: ‘responsibility’ five times, ‘leadership’ three times, and ‘one person’ twice. The juxtaposition of ‘thinking’, ‘choices’ and ‘independence’ provides an insight into the dynamic view: its qualities of discernment among options while tailoring the guidelines for sustainability to the particular conditions faced by the individual are very much

part of being a sustainability chef with a well-developed sustainability framework. A sense of individual sovereignty and the ability to foster sovereignty form a key aspect of both the dynamic view and the developing nature of a sustainability chef, where a shift in perspective begins with thinking and with the development of the skill of thinking for oneself when determining the choice among options.

In the following excerpt first used to illustrate CA-Coord's response to Q10 in Chapter 6, five subthemes are touched on of 'action', 'thinking', 'responsibility', 'interconnections' and 'integration'.

The systems thinking I told you about before – which really values the whole multi-ocular view of the multistakeholder perspective.... Jay Forrester talked about systems thinking as a way of thinking, and learning, and managing, and problem-solving.... It's not just viewing the world in a certain way, but that has to be manifested through how your organization works. The reason that you have good teaching practice, small group work ... why? Because it reflects the interconnectedness of things (CA-Coord, p. 57).

In many ways the final sentence of this excerpt from CA-Coord may be considered a Stage 6 marker, as it is an example of seeing and seeing the value of a unifying principle across multiple levels of reality. Another point to consider regarding this response is that Q10 had six thick responses, with five of those by participants in Stages 5 and 6 (see Table U1, Appendix U). These responses, then, provide a view of a well-developed perspective, rather than still-developing perspective, with Q10 appearing as something of a litmus. The subtheme of 'interconnections' infuses this excerpt and links the indicator subthemes of 'thinking' and 'responsibility'. CA-Coord shares her view that humans' communication and institutions are a reflection of nature's interconnected system, with a bidirectionality of support. A school with a strong sustainability program will have within its membership individuals who have recognized the importance of systems and the interconnection of things, endeavouring to bring some sense

of these into their working style. The precursor to making this happen may be a shift in thinking towards a systems view, accompanied by sharing the responsibility among others within a multistakeholder group. The Canadian coordinator expresses the value of a unifying principle not just to the EcoSchools program within a given school, but to the way that a group of individuals and an institution interested in sustainability may actually function. This response was shared in relation to Q10 of the engagement strand, a strand that has three questions (Q6, Q9, Q10) where almost all of the thick responses are found in excerpts of Stage 5 and 6 participants (see Table U1, Appendix U). This fact might suggest that out of interpreting, connecting or engaging with a sustainable future, the last one provides the greatest degree of challenge.

The following excerpt from CA-Teach5's response was used to illustrate Q2 in Chapter 6 and touches on nine subthemes (see Table T2, Appendix T), including indicator subthemes for the wide, deep and dynamic views. Both her colleague CA-Teach6's excerpt in a section above and SV-Coord's excerpt later in this section speak to all three of these views. However, CA-Teach5 uniquely addresses three of the deep view subthemes, whereas each of the other two only touch on one.

I guess in high school I never really thought about it a lot, other than my cultural background tends to make me frugal. My family comes from India, and they recycle, or sell, or re-use everything.... It becomes almost sacrilegious to throw something out ... which we do all the time, because that's the culture here.... But then in university, in teachers' college, I had [this particular] teacher, and I took the environmental course ... and I found that I agreed with a lot of the ways that he thought about things. And the idea that you can change society, even if you're just one person. I think as teachers we have a responsibility – and also a bigger effect than we know.... Because we have the kids, and we talk to them about things and they have a chance to kind of ruminate – and I think if you hit them long enough and hard enough, and they can see that it's valid – and show them

the differences between one lifestyle and another ... not make the choice for them, just show them the opportunity to make the choice... (CA-Teach5, p. 1).

The overlaps of subthemes arising in the excerpts by CA-Teach5, CA-Teach6 and SV-Coord may reveal some commonality of approach among these Stage 5 participants. As suggested earlier, the overlap of ‘thinking’, ‘choices’ and ‘responsibility’ apparent in CA-Teach5 and CA-Teach6’s excerpts provides insight into something of a school-wide approach based on collaboration between members of the community while thinking through the implications of different options. The overlap of ‘thinking’, ‘choices’ and ‘independence’ that CA-Teach5 shares with SV-Coord may reveal these two participants’ commonality of approach in supporting those around them to unpack sustainability for themselves, independently of others’ detailed specifications, so that it is relevant to the situation in which they find themselves. In both cases, a key building block for the orientation of these participants is that of ‘thinking’, with its concomitant openness to a shift in perspective towards an even greater alignment with sustainability, a significant factor within the dynamic view and an integral part of developing as a sustainability chef.

Although one other connection strand question (Q5) reveals responses that touch on the majority of the later-stage subthemes (see SV-Coord and LT-Teach2 in Table S5, Appendix S), this excerpt for CA-Teach5 for Q2 above is the only one of all the coded responses that includes all four of the later-stage indicator subthemes. As such, it shows the complete use of ‘thinking’, ‘choices’, ‘independence’, and ‘one person’ through the arc of a participant being influenced to shift her own thinking, in this case by a charismatic teacher, towards perceiving different choices, unpacking sustainability for herself, and knowing that one person makes a difference. She describes in this excerpt her own work with students and the way this process is repeated and reflected in the next generation. This is an example of response architecture revealing content meaning. Significant skills supporting this cycle are the willingness to provide the time

and space to students to develop their own sustainability style, offering an appropriate level of support that is neither overbearing nor parsimonious in its nature. Echoing CA-Teach5's comment of wanting to "not make the choice for them", SV-Teach2 states the difficulty of finding the balance of support when working with her students, regarding when to help and when to not help, as illustrated in the final excerpt of the section.

Both the excerpts below by LT-Coord and SV-Teach2 (see later in this section) provide insight into the interaction between the dynamic and both the deep and long views. The new excerpt below by LT-Coord touches on the subthemes of 'thinking', 'leadership', 'responsibility' and 'citizen'.

In the future, program should be going deeper. EcoSchools should educate for conscious citizens (LT-Coord, p. 43). In curriculum, and influence on community ... a real influence (LT-Coord, p. 44).

The way that these three views come together in this excerpt underscores LT-Coord's belief that authentic ESD might be accomplished through the EcoSchools program, and would be evidenced by those engaging in the program. The concept that the best indicator of authentic ESD is seen in the individuals who have experienced it has been shared by other participants, notably in the Chapter 7 portraits of SV-Teach2 and CA-Coord. Here, LT-Coord states the importance of widening the bounds of an ordinary school by showing leadership and working directly with its surrounding community. Again, the precursor to this is a shift in the thinking, where the program would help shape the consciousness of the engaged citizens.

The three views evidenced in the following new excerpt relating to Q5 by SV-Coord are the dynamic, wide and deep views, touching on the subthemes of 'thinking', 'choices', 'independence', 'concrete examples', 'action' and 'balance'.

Really important – show both sides in parallel. Give pupils many different perspectives about issues, and then to take action. To think "what do I want to do,

what do I think here” and then to show them how to take action, and then to take action (SV-Coord, p. 10).

This excerpt provides insight into SV-Coord’s thoughts regarding the importance of taking action to support a liveable future. Before action may be taken, however, she points out there are a number of requirements. Firstly, it is necessary to provide a sufficiently varied background to students so that they are in a position to see that a number of choice paths are available to them. In the other excerpt in this section touching on the same three views, CA-Teach5 also points out the importance of being able to “show them the differences between one lifestyle and another” (CA-Teach5, p. 1). Both educators are clear that fostering sovereignty of the individual is essential. In a school setting, for instance, it would be important to show, as SV-Coord points out, “both sides in parallel,” yet leave students the freedom to actually choose, having instilled in them the skills required to see a choice through. From a sense of sovereignty springs the ability to unpack the thinking process and make it one’s own, providing a sense of independence touched on by SV-Coord here. Appropriate action leading towards sustainability is then one of the natural products of this process. Table 16 in the next chapter captures the various elements of this arc of development as characteristics of a sustainability chef.

The following two excerpts are from colleagues in the same school, SV-2, and they have in common indicator subthemes that touch on the dynamic and wide views. Indicator subthemes from these same three views were touched on by LT-Coord earlier. In the first excerpt, which first appeared within the interpretation strand portrait in Chapter 7, SV-Admin2 touches on the subthemes of ‘thinking’, ‘independence’ and ‘real life’.

Our pupils shall have the opportunity to learn about the many things – that they can decide what is the best. It’s so difficult nowadays to make right decisions in society, to know lots of things – to mention anything – energy, or... (SV-Admin2, p. 1). Pupils should have experiences, concrete experiences... (SV-Admin2, p. 4).

Even though the excerpts from the two colleagues at SV-2 relate to different strands of questions (interpretation and engagement), they both touch on ‘independence’ and ‘thinking’ and so provide some insight into the sustainability style at this school. Both educators have as a focus the desire to work with students in a way that encourages them to make their own decisions. Similar to the comments from SV-Coord and other participants, SV-Admin2 points out the need for students to be exposed to a variety of approaches relating to sustainability. It is from that variety that they would then be able to choose for themselves what appears to be most appropriate for the circumstances they face.

The process of actually working with students is explored to a greater extent in the following excerpt by SV-Teach2. In this new excerpt relating to Q7, she touches on the subthemes of ‘thinking’, ‘independence’ and ‘leadership’.

The hard thing is to help students when they need help but not help them when.... It’s a very hard thing to do.... And it was really interesting, because the students wrote a pamphlet, what I should do and what I shouldn’t do.... They told me, and I still work with it, because otherwise I should be the one that says, “Oh, you should do this or that”, and they wanted to tell me what to do (SV-Teach2, p. 18).

Here, SV-Teach2 points out that one of the challenges in fostering greater sovereignty in students is working at the envelope of explicit support, an envelope which has unique characteristics for each student and changes over time and with their age group. This excerpt also evidences students effectively teaching their teacher, a point raised by other participants, where students are seen to teach other students, educators, or members of the community (see Chapter 7: CA-Admin1, Stage 5 portrait; CA-Coord, Stage 6 portrait). A characteristic of a strong sustainability program is not simply seen in the students, as discussed earlier, but it is revealed that there is a reciprocity of learning among students, teachers, and other community members. In fact, as captured in Table 15 of the next chapter, students may be seen as vectors of the learning, moving it from the realm of the classroom outwards.

Both SV-Admin2 and SV-Teach2 touch on ‘leadership’ and ‘thinking’, which may provide insight into aspects of their work with individuals, with its focus of bringing about a shift of perspective based on thinking that might be a spark to pass on to other individuals through their leadership skills. Given sufficient sovereignty, individuals who at points may have been playing the student role may shift towards the teacher role. In fact, if *all parties* are sufficiently enabled sovereign entities, teaching is an emergent quality, where the trained educator might be understood to more closely resemble a mediator, facilitator or co-collaborator: the lived example of the dynamic view. Mediation, in fact, is the third of three learning strategies identified by William Scott and Stephen Gough: “...the notion that learning accrues is widespread in that the teacher role is to mediate children’s experiences so that something can be learned” (Scott & Gough, 2003, p. 40).

How the Views Work Together

The following excerpts illustrate subthemes from three (long, deep, dynamic) views within one excerpt. In his preface to *Ecological Literacy* (Stone and Barlow, 2005), Fritjof Capra touches on the subthemes of ‘topophilia’, ‘responsibility’ and ‘thinking’. “Education for sustainable living fosters both an intellectual understanding of ecology and emotional bonds with nature that make it more likely that our children will grow into responsible citizens” (Capra, 2005a, p. xv). Another example of these three views appearing in one excerpt can be seen as Derek Hodson describes the final level of sophistication in his suggested issues-approach. In doing so, he touches on ‘action’, ‘topophilia’, ‘responsibility’, ‘motivation’, ‘one person’ and ‘thinking’:

The final (fourth) level of sophistication in this issues-based approach is helping students to prepare for and take responsible action. Socially and environmentally responsible behaviour will not necessarily follow from knowledge of key concepts and possession of the “right attitudes”.... Those who act are those who have a deep personal understanding of the issues (and their human and environmental implications) and feel a personal investment in addressing and

solving the problems. Those who act are those who feel personally empowered to effect change, who feel that they can make a difference, and know how to do so (Hodson, 2003, pp. 656–657).

These excerpts show the way that a connection to nature is combined with a quality of thinking and a sense of aspects of the deep view such as ‘responsibility’ to support an individual’s engagement in sustainability.

All four views appear within an excerpt from “Optimism and Hope in a Hotter Time”, as David Orr explicitly and implicitly touches on ‘action’, ‘leadership’, ‘choices’, ‘responsibility’, ‘one person’ and ‘thinking’:

People ... must be asked to be citizens again, to know more, think more, take responsibility, participate publicly.... They will have to see the connections between what they drive and the wars we fight, the stuff they buy and the crazy weather.... They must be taught to see connections between climate, environmental quality, security, energy use, equity, and prosperity. They must be asked to think and to see (Orr, 2007, p. 1394).

In this context, the value of being able to see relates to perceiving the opportunities provided through the choices available. Orr’s sustainability guidance may be challenging, but it would lead to actions taken and leadership shown in both private and public spheres which reconcile with each other. Paul Stern, in his article “Toward a coherent theory of environmentally significant behaviour” (2000), would suggest this reconciliation as a significant step towards a more integrated approach to sustainability.

The previous sections outlined the four views – long, wide, deep and dynamic – with illustrations of how subthemes contribute to each of them separately as well as in various combinations of views. In a larger sense, the views can be seen as working with each other, particularly when considering what is entailed by the fresh perspective described in the dynamic view and its associated subtheme of ‘thinking’, aspects of which could be termed sustainability cognition. The following figure illustrates a positive feedback effect based on an oscillation, rather than a direct cycle, showing how three of the views (long, wide, deep) can be taken as

seeds which contribute to the dynamic view; the dynamic view itself reciprocally shapes the other views. Although characterized as an oscillation, the portrayal is not that of a pendulum whose arc would dampen over time, but rather a feedback in which the energy from the views is self-perpetuating and would sustain or even increase over time.

Figure 28. Seeds of views oscillating with the dynamic view.

What the above figure illustrates is that the development of a truly dynamic view goes beyond fixed static entities and supports emergence, resilience and sustainability as they arise through the unique conditions faced. Flexibility of perception drives choices beyond the standard protocol or ‘how-to’ responses, empowering educators, and indeed students, to “make it their own,” with sovereignty blooming out of the seeds identified in the first three views. Equally seen in the reverse sense, the quality of thinking associated with the dynamic view leads to increasing the spirit of sovereignty in individuals, which puts them in a place where standard solutions or formulations of problems may no longer be accepted because of the reduced

ownership entailed. Moving beyond these, individuals develop the capacity to perceive the dynamic quality of situations they consider, appreciating how various factors which also include their own perceptions and cognition may shift as part of a dynamic system. These five elements emerge as a suite of related qualities through a positive feedback system as individuals develop as sustainability chefs. A final, key point to make is that as an individual grows in the practice of sustainability, the freedom of movement within the feedback system depicted in Figure 28 will naturally tend to increase, just as the individual experiences a growing liberation from fixed patterns of thinking.

Conclusion

In Chapter 5 a model of sustainability perspectives was proposed which had emerged empirically from the data. The vertical and horizontal analyses shown in Chapters 6 and 7 provided different ways of seeing the data when viewed through the lenses of interview question or stage of participant. Chapter 8 is not simply a third stance for understanding the data. If Chapter 6 could be considered the transverse plane in the dissection of the data and Chapter 7 the longitudinal plane, Chapter 8 goes beyond the simple requirements of the sagittal plane. As a form of meta-analysis, it allows for insight into the sustainability perspectives of participants. Perforce, this chapter relied on a detail of data that contributed to a pointillistic sense of four views. The long view and deep view both have two subthemes emerging from the outset of thick responses in Stage 2; the wide and dynamic views are both constituted of a single key indicator subtheme, both of which are indicators of the latter stages, appearing in Stages 4–6. If the long and deep views include both developing and developed perspectives, the wide and dynamic views tend to a greater extent to reveal more developed perspectives. The image provided from a little distance of the detailed data shows that the views contain seeds which contribute to the development of the dynamic view, yet work together in an oscillating form of positive feedback

that can be thought of as integral to an individual's sustainability framework. This conception of the dynamic system of views, together with the proposed model of sustainability perspectives, are the main outcomes of this thesis.

Chapter 9:

Conclusion

Introduction

This dissertation relates to an empirical model of sustainability perspectives emerging from EcoSchools-certified secondary schools in Canada, Lithuania and Sweden. Situated within the field of education for sustainable development, the primary data for the study were interviews completed (mostly on a single day) in the spring of 2006 with 30 individuals (national coordinators, caretakers, teachers, and administrators) at ten schools. In the course of the research the focus moved away from the program toward increasingly exploring the structure and content of responses, which would reveal participants' sustainability perspectives. This chapter summarizes the main outcomes and findings detailed in the previous four chapters. It also provides a critical evaluation of the study and suggests future directions in which work might be pursued, with points raised at relevant junctures throughout the chapter as well as in designated sections.

The context for the study, set out in Chapters 2 and 3, was taken to be the three component spheres of ESD: environment, economy, and society, with education being the appropriate dimension of the societal realm to focus on. The significance for the key outcomes and findings of establishing a broad context lies in large part in the necessary contextualizing of the key outcomes of the stages and views, in which awareness of issues such as consumerism, species loss, and the need for a deep shift in thinking (to name but three) are integral, as well as in many of the specifics of the key findings.

Summary of Outcomes, Findings, and Methodological Developments

The principal research question that this thesis has investigated is as follows: *What are the qualities of the sustainability perspectives of adults engaged in a whole-school sustainability*

program? One preliminary answer to this question is that an individual's sustainability perspective is their own interface with the environment, supporting engagement through their perception of, connection with and thinking about the environment, and their choices regarding action toward shaping a liveable future. At the embarkation point of this thesis, the nature of one particular whole-school sustainability program as it had been realized in various schools in three nations was at the study's core, but what was actually revealed was that the individuals who had initiated and continued the program were of greater import, with their individual sustainability perspectives being the most significant aspect of all.

An individual's sustainability perspective is both as unique as the DNA in their cells and, just like this complex biological molecule, constituted of universal building blocks, in this case representable by the views (long, wide, deep, dynamic). The data set for this thesis indicated six discrete stages, as outlined in the model of sustainability perspectives, but it did not capture the movement of an individual from one stage to another, which would have required different methodology, as discussed in a later section. Therefore, an aspect which was not captured in this data set but may reasonably be extrapolated from it is that an individual's sustainability perspective may change and develop over time: some aspects emerge early and continue their development; other aspects appear only at later stages. One important feature of Figure 27 (see Chapter 8) is that it indicates that aspects of the four views, in the form of different subthemes, appear at the earliest stages ('action', 'time', 'topophilia', 'leadership', 'responsibility', 'motivation'), whereas other subthemes only appear in higher stages ('choices', 'independence', 'one person', 'thinking'). A visual image to portray the different stages of sustainability perspectives might be that of a young fruit tree: over time its canopy develops and continues to become more complex, but fruit itself only appears in mature specimens. To take this analogy a little further, the methods used in this thesis allowed for snapshots of different young fruit trees to be taken with a still camera at various points; these were then ordered and the pattern relayed

through the model and views, rather than capturing this progression within one individual through the use of time-lapse photography. Visits to the schools in this study amounted to seeing them at one point in time, affording snapshots only, rather than the luxury of observations over an extended period as with a more longitudinal approach.

The model of sustainability perspectives was a means of detecting individuals' sustainability framework at a point in time as seen in six stages, whereas the four participants' views (long, wide, deep and dynamic) were a means of depicting sustainability perspectives as entities in themselves as well as within the proposed oscillating system of views that represents how they may function together, particularly over the course of time. The process of moving along the oscillating system of views, as a representation of the process through which an individual explores and elaborates their experience of the views over time, could usefully be identified with sustainability practice. Whereas every individual in this study has shown aspects of these views, they are most clearly seen and fully realized in the Stage 6 participants. A way of conceiving the system of views is that if each individual has experiences such as the oscillating system of views represents, perhaps the Stage 6 participants have had particularly effective sustainability practice. One of the implications of this research, to be discussed in a later section, is to find ways and means of supporting and creating opportunities for individuals of all ages to engage in such sustainability practice.

The following sections outline the substantive insights from this thesis: the outcomes regarding the model and the participants' views and the findings regarding sustainability program insights as well as the nature of a sustainability chef. Points regarding methodological developments are also included, as well as a summary section synthesizing the substantive insights. These insights lie within the scope appropriate to the qualitative field of study within which they are situated.

Key Outcome: Proposed Model of Sustainability Perspectives

The first chapter of results, Chapter 5, outlined how the initial phases of data analysis lead to the emergence of a model of sustainability perspectives, based on responses over three question strands and entailing six stages. The model was then used as a lens to unpack ten interview questions, in Chapter 6, and to gain insight into the portraits of the participants themselves, in Chapter 7. The three strands of connection, interpretation and engagement were ways of considering the ten questions that not only brought clarity to patterns emerging from the data, but also contributed to the creation of the model. As discussed in Chapter 3, other researchers have also presented models of learning that illustrate a similar progression and/or strand structure: Stephen Sterling, using terms such as seeing, knowing and doing, or praxis, eidos and ethos (Sterling, 2003, p. 431); Argyris and Schön's (1978) use of the terms single and double loop learning, with Sterling's extension of it towards triple loop learning; Gregory Bateson's (1972/2000) Learning I, II and III, which has influenced the other two models. The model presented in this thesis differs from others in that it is empirical, springing directly from data collected from active practitioners in the field, rather than emerging as a theoretical entity. It may be considered a structural model, describing the way in which the sustainability frameworks of the study participants are layered according to a connection-interpretation-engagement sequence, rather than a developmental one. It was also shown to support the possibility of a progression through the strands, where data suggest first a stronger connection, then stronger interpretation, which in turn would lead to stronger engagement with sustainability. To reveal such a progression within one individual would have required a longitudinal approach, which was not possible given the confines of doctoral research. That such a study would be of value is clear, given that educators must have developed their sustainability frameworks and perspectives over time in some fashion. Such development would almost inevitably leave its traces in the structure of the sustainability framework, and thus a structural perspective gives

insight into developmental questions, just as a sequence of still photographs of a galloping horse reveal something of how the animal's legs move as its running might be captured by a video camera. Thus, one may argue that the model of sustainability perspectives lends significant insight into the process of becoming a sustainability chef, as well as the processes embodied in being one.

This said, the implications from the suggested progression within the data also point to the fact that an interest in improving the state of the environment requires not only skills developed in the realm of interpretation or knowledge, but most significantly the motivation for knowledge and developing interpretation skills that arises from a primary sense of connection to the environment. If action has a precursor of interpretation which has a precursor of connection, then both future research and practice would be better informed with a greater exploration of these three strands, as outlined in a later section.

Besides the strands on which the model is based, its other main feature rests in its six stages, with each stage characterized by the type of responses participants made to questions within the three strands. The model proposed in this thesis has qualities both similar to and different from that outlined by Chris Gayford in his 2009 study. Gayford's three-year longitudinal study of 15 schools across England was from the pupils' perspective (primary students in Years 4, 5, 6; secondary students in Years 8, 9, 10) and proposed a four-stage model for what he termed knowledge and process abilities. While he states that knowledge and process abilities are "two parallel, but interconnected aspects" (Gayford, 2009, p. 19), he does consider them separately and provides evidence on the basis of a separatist view. The model proposed in this thesis suggests that there are three strands on which the stages are based which are inextricably connected and so cannot be authentically considered separately. If the model is given a developmental (as opposed to purely structural) interpretation, progression follows an order in that a shift in the quality of response in engagement appears only after a shift in

interpretation, which itself only appears after a shift in connection. Gayford's study involved a larger sample over a longer period of time: groups of 6–12 pupils for discussions at 15 schools over three years totaling over 70 visits (Gayford, 2009, p. 9); compared to 30 adult participants at ten schools with visits on one or two days in the present study. However, the fact that the results of Gayford's study are substantially reflected in those from the present study is of significant interest. The similarities perhaps suggest the model of sustainability perspectives could be used as a working hypothesis while exploring avenues of further research to be pursued through expanding the sample size, time frame, or even approach of the study, if it were to be shifted toward a manner of participatory action research (PAR) which might allow for following participants through an active process of sustainability framework development. As the primary data for both the present study and that done by Gayford were the interviews themselves, one significant point that neither study addresses in any substantive way is how participants' statements relate to evidence seen, a gap that might also be usefully addressed in the future.

Key Outcome: Proposed Portfolio of Views

The fourth results chapter outlined a style of meta-analysis resulting in a portfolio of four views (long, wide, deep, dynamic), with the focus being the ten most frequent subthemes arising in participants' responses, as seen in Chapter 8. The subthemes of 'action' and 'time' are associated with all four views, whereas 'topophilia' and 'leadership' are associated with the long view of the connection strand; 'choices' is associated with the wide view of the interpretation strand; 'responsibility', 'motivation', 'independence' and 'one person' are associated with the deep view of the engagement strand; 'thinking' is associated with the dynamic view. Some participants revealed clear insight into one or more of the views, while others portrayed more variable clarity in their responses. As was the case regarding the model of sustainability perspectives, the views expressed were not aligned with a particular school, nation or job (with

the possible exception of deeper topophilia for many of the Lithuanian participants), but rather were infused without marked influence from designations of gender, culture, age or employment. Although mainstream comparative analyses were less emphasized in this study than had been planned at the outset of its design, the extent to which national context relates to results such as these would be worthy of future research.

The significance of the views in some ways lies less in the relative contribution individual subthemes make to a given view and more in that the four views separately and together are sufficiently robust to reveal a way of being with respect to the environment, which is one of living responsiveness to what arises, rather than prescribed action. Such a way of being would have profound implications for an individual's sustainability perspective and would suggest that such a sustainability framework, together with the perspective it generates, constitutes a shift into a new sustainability paradigm. A primary characteristic of the views is that although they are applicable to any individual, they arise in individuals as a unique response to the conditions they face; they are in all senses of, by, and for the individual, and stand as a means of expressing that individual's ability to contribute to a common, liveable future.

Another aspect of the views is their embedding in an expanding awareness of the broader context for ESD, as developed in Chapters 2 and 3. The following quote illustrates a sustainability perspective with long, wide and deep aspects that reflects issues of ecological threat, corporatism and the barriers to ordinary citizens' making connections between their food purchasing and loss of biodiversity:

A Cherokee friend of mine, they're using an ancient strain of blue corn seed and I was given about ten individual kernels, so right now we're just trying to grow more, and then hopefully save that seed and distribute it to seed banks. But, in the face of terminator seeds and genetic modification.... And it's the small things that people may not understand what they can do or understand even what we're doing, that can make a difference. Saving a species of plant for food purposes for

our future generations is paramount right now. And as Vandana Shiva was saying in *The Corporation*, this is sustaining life... (CA-Teach1, p. 9).

The four views give the impression of an outer awareness, as seen through the subthemes associated with them such as the love of nature, choices made, or sense of responsibility. In their essence, however, they are “inner views”, and as such give glimpses into a person’s inner sustainability framework. This notion recalls a speech given by Matthew Brennan in Montreal almost 50 years ago. While emanating from the conservation movement, Brennan’s insight is relevant to the field of sustainability learning in the 21st century. He touches upon the importance of developing an individual’s inner environment:

We are really talking, then, about a new kind of education. I call it “education for the total environment”. Surely it involves understanding of the external environment. But if we are to accomplish ... [it] must involve the inner environment of the child as well. The reasons people conserve are internal, based on values which psychologists tell us are developed at a very early age (Brennan, 1964/1974, p. 17).

Brennan concludes his address in a self-effacing manner as he refers to himself and Paul F. Brandwein, his codirector of the Pinchot Institute at Grey Towers, Milford, Pennsylvania, by saying that “Dr. Brandwein is one of the leaders in educational thought and development. I have always been a wild dreamer” (Brennan, 1964/1974, p. 19). For educational leaders and dreamers alike, valuable future directions in research would relate to the nature and means by which individuals develop their personal sustainability paradigms as illuminated by their portfolio of views or perspectives.

Key Finding: Insights into Sustainability Learning Programs

While a specific focus of this study was the EcoSchools program, a number of valuable insights emerged into the implementation, challenges, and success factors associated with sustainability learning programs in general. In many cases, schools within the study had already been practising many, if not most, aspects of an EcoSchools program prior to its formal

adoptions, in some cases having formed “eco clubs” which became the basis for the EcoSchools “Ecoteam”, or EcoSchool committee, and perhaps for this reason interview questions regarding the EcoSchools program often attracted responses reflecting a broader perspective. The following table summarizes program insights arising in the participant quotes and analysis from Chapters 6 through 8. It is noticeable that significant areas of insight touch on aspects of citizenship and engagement within communities, which are relevant to the discussion in Chapter 2, and hope, motivation, cognition and systems thinking, contextualized in Chapter 3.

Table 15

Insights into Sustainability Learning Programs

Program Aspect	Insights
School culture	Caring leadership by authentic example Developing rapport with students Collaborative problem solving School’s willingness is key to program adoption
Whole-school involvement	Multiple players empowered Students give the lead to administration The need for shared responsibility is what drives synergy Shared responsibility going beyond program remit
Motivation, hope and empowerment	Need to overcome student doubts as barrier to behaviour change Hope as a hub for change and action Empowerment through making a real difference
Active engagement	Projects should be real Ground learning in real experience – vital for change to occur
Cognition	Need for underlying paradigm shift Work at level of systems and interconnections Shift to systems thinking as a unifying principle for program Reflect systems thinking in functioning of organization, teaching style
People as the product	Shift in thinking critical to fostering consciousness of future citizens Program needs to be deeper to produce full environmental consciousness Students as primary indicator of program’s success, school’s environmental impact
Process as the product	Differentiating sustainability practices from good general practices Shifting from goals emphasis to process emphasis

	Building critical and systems thinking skills is central to process
Change: the ripple effect	Self-set educator/school goals beyond program remit, based on educator's or school's own sustainability framework Students as outward vectors of learning into families and communities Individual is at the interface of multiple communities, thus the hub of change
Creating sustainable action	Inner impetus drives sustainable action Determine "winnable" priorities and projects Build program on foundation of successes (and celebrate them) Judge the best pace for personal and institutional learning, supporting motivation through an extended process
Program sustainability	Key to program sustainability is sustainability orientation of the various players, including students Key indicator of a sustainable project: it continues in succeeding hands
Building sovereignty	True freedom to choose as citizens is based on a full practical and cognitive skillset Focus on thinking fosters a metacognitive approach to ownership of choice and action

The insights collected here are very much in the nature of qualities or ingredients that a sustainability learning program might usefully possess, rather than blueprints for constructing such a program.

Key Finding: Characteristics of the Emerging Sustainability Chef

Perhaps the most striking finding of the study is the message emerging from the totality of responses that *individual educators*, whether in terms of their own inner compass or in synergistic collaboration, are the key to effective ESD. The table below organizes and summarizes characteristics for these sustainability chefs, as revealed in the participant quotes and analysis from Chapters 6 through 8. As with the program insights presented in Table 15, cognitive dimensions, such as a shift to an ecological paradigm and big-picture thinking, and socioeconomic aspects such as citizenship play a significant role. It is important to note that, while the fullest development of a personal sustainability framework is seen in later stages of the model of sustainability perspectives, many characteristics emerge at numerically earlier stages.

One additional point regarding the first framework dimension in the table, “Style of communication”, is that this particular set of characteristics details some striking commonalities among the perspectives of the participants, as revealed by the ‘architecture’ of their responses. Such architecture is also relevant in part to the second dimension, “Emergence through stages”, covering Stages 2 through 6 (these being the stages that have a predecessor stage from which they represent a transition).

Table 16
Characteristics of Sustainability Chefs

Sustainability Framework Dimension	Characteristics
<i>Structural dimensions</i>	
Style of communication	<p>Repeated patterns of shared subthemes suggest commonalities of concepts and vocabulary, particularly for Stage 6 participants</p> <p>Increasing frequency of thick responses correlates to increasing thickness of responses; implies that thinking becomes more connected</p> <p>Through the stages, a shift to a less linear paradigm of thinking, supporting choice</p> <p>Diversity of thinking increases with stage</p>
Emergence through stages	<p>Stage 2 participants: emerging awareness of environmental issues but without socioeconomic dimensions; focus on personal and/or within-school action</p> <p>Stage 3 participants: deeper connection and broader awareness of the environment emerges as driving force</p> <p>Stage 4 participants: understanding emerges of linkages through time, space and issue; awareness of complexity engenders doubt</p> <p>Stage 5 participants: strong sustainability-learning orientation; emerging clarity around motivation–action–result sequence; combined theme of action, responsibility and leadership emerges</p> <p>Stage 6 participants: fully developed articulation of sustainability perspective extending in space and time; placing transformative factors at centre of sustainability learning</p>
<i>Personal dimensions</i>	
Personal orientations	<p>Inner impetus drives sustainability action</p> <p>Even given big-picture view of extent of influence, can only really change self</p> <p>Outward flow of paradigm change from the individual</p> <p>Self then becomes hub of outward-flowing change</p> <p>Skillful interpretation of conceptual understanding given particular conditions</p>

Authenticity	<p>Living in alignment with ideas taught</p> <p>Grounding theory in own lived reality</p> <p>Influence students by demonstrating sustainability in own actions</p> <p>Openness to and appreciation of student involvement and particularly leadership</p>
Going beyond	<p>Sustainability education is not just about responsibility <i>for</i> implementing program, but responsibility <i>to</i> something larger</p> <p>Self-definition of sustainability learning goals beyond school and/or EcoSchools program, given unique conditions in the school and beyond</p> <p>Extending motivation–action–result sequence into advocacy</p> <p>Authentic engagement with sustainability learning both depends on and drives a shift in thinking</p>
<hr/> <i>Cognitive dimensions</i> <hr/>	
General cognition	<p>Behind-the-scenes and out-of-box thinking are key sustainability skills</p> <p>Cobb’s ‘Itness’ (1959, p. 546) represents a deep quality of environmental awareness, transferable even to urban settings (Carson, 1965, p. 49)</p> <p>Feedback cycle through the views (Figure 28) needs to be supported by cognitive shift toward dynamic, holistic, ecological paradigm</p> <p>Cognitive shift is key to shaping environmental consciousness of future citizens</p>
Systems thinking	<p>Systems thinking informs insight that in sustainability learning ‘how’ is more important than ‘what’</p> <p>Systems thinking acts as unifying principle for sustainability learning</p>
Reciprocities	<p>Modern living disguises interconnections and consequences; as for instance not seeing what becomes of our garbage</p> <p>Appreciating reciprocal connection between humans and nature overcomes modern disconnect</p> <p>Connection to nature leads to action, which then reinforces connection in a reciprocal relationship</p>
Compassion	<p>Compassion underlies a multistakeholder orientation, and is essential to human dimension of problem solving</p> <p>Compassion implies sustainability beginning with self in the here and now</p> <p>Encourage thoughtful choices with sensitivity to necessary time</p>
Personal transformation	<p>Cognitive shift leads to a sense of responsibility and to empowerment</p> <p>Personal arc through influences in background to a cognitive shift, to seeing different choices, to unpacking sustainability and ultimately to seeing that one person can make a difference</p> <p>Thinking skills support development of sovereignty</p>
The bigger picture	<p>Embedding school sustainability work in larger context of sustainability efforts</p> <p>Multistakeholder perspective leading to authentic sustainability framework in which the sustainability <i>process</i> is the outcome, extending beyond school in time and space</p>

	<p>Sustainability learning relates to life-skills education for future unknowns</p> <p>Value of skillset enabling positive change in the wider world</p> <p>Ripples of change are also generational</p> <p>Taking past, present and future dimensions of time into account</p>
Discernment	<p>Determining projects, priorities likely to bring success</p> <p>Discerning among options, tailoring sustainability to particular conditions</p> <p>Exposing students to a variety of approaches, enabling them to exercise and develop their own discernment</p>
Dynamic reality	<p>Adaptive thinking is stimulated by new situations</p> <p>Preparing for choices in an unknowable future: building adaptability</p> <p>Supporting others to unpack sustainability for themselves, thus making it adaptable</p> <p>Sum of the four views is a living responsiveness, not prescribed action</p>
<i>Engagement dimensions</i>	
Motivation and hope	<p>Sustainability learning depends on motivation: learning cannot be coerced</p> <p>Challenging states of mind such as loss, uncertainty need to be overcome</p> <p>Beyond rational optimism, hope fosters open-mindedness, solutions focus</p> <p>Need to balance problems with solutions: belief in possibility of making a difference is essential</p> <p>Actively maintain hope for students</p>
Empowerment	<p>Empower students to experience making a difference, making effective action a reality</p> <p>Engagement of students leads to a shift from passive to active learning</p> <p>Concrete experiences as way to empower students to make good decisions</p> <p>Appropriate support enabling students to develop their own sustainability style</p>
Choices and solutions	<p>Students communicating and developing solutions as well as learning about problems</p> <p>New choices, informed by seeing interconnections, help to break cycle of unsustainable cause and effect</p> <p>Appropriate action is grey-scale, not black/white</p> <p>Grounding through concrete experience is key to real choice</p>
Practices and educative style	<p>Differentiating sustainability practices from good general practices</p> <p>Operationalization of theory via thinking shapes sustainability priorities and time sensitivities</p> <p>Moving from knowing to initial action to continuing efforts</p> <p>Iterative or double-loop learning enables students to experience values shift</p> <p>Mediated learning models and supports shared responsibility and collaborative effort</p>
Collaboration and creativity	<p>Collaborative style of sustainability education, building buy-in by stimulating awareness</p> <p>Leaders moving from isolation toward coming together as a real success</p> <p>Dynamic nature of collaborative creativity</p>

Non-protocol approaches release group creativity
 Creativity as a conversation – suggests ‘communication’ and ‘mediation’
 modes of teaching and learning

<i>Summative dimensions</i>	
Citizenship	<p>Empowering students to reorientate their belief systems toward sustainability</p> <p>Students’ own developing sustainability frameworks as primary indicator of successful sustainability learning</p> <p>Deeper sustainability learning is needed to foster conscious citizenship</p>
Sovereignty	<p>When all parties have sufficient sovereignty, teaching is an emergent quality, mediation-style (lived example of dynamic view)</p> <p>Fostering sovereignty via cognitive development is key</p> <p>Sovereignty amounts to true freedom (i.e. ability) to make choices, see them through</p>
The inner chef	<p>Working with what is to hand, responding to conditions, shaping new solutions through leadership, synergy, and new thinking as transferable qualities, leading to sustainability cognition</p> <p>Seeing sustainability and sustainability learning as an ongoing practice</p> <p>Four <i>inner</i> views as glimpses into inner sustainability framework; Brennan (1964/1974, p. 17): “[it] must involve the inner environment\”</p> <p>Above all, the quality of retaining a beginner’s mind</p>

The characteristics presented above are neither exhaustive nor proscriptive; they represent simply an impression of possibilities for a personal sustainability framework, and their nature should make clear that individuals must discover such a framework within themselves.

Methodological Developments

While this study made use of a number of mainstream qualitative research techniques (for instance: semistructured interviews, triangulation, field notes, projection techniques, transcription, coding, memoing), methods particular to the study were developed, including the creation of précis documents, the designation of response style, word counts, two-way matrices and word maps. These methods used others’ work as a starting point and allowed the story implicit in the data to be revealed. As outlined in greater detail in Chapter 4, Miles and Huberman characterize the spirit in which others’ methods became a springboard, thus “adapting [the methods] of others or inventing new ones” (Miles & Huberman, 1994, p. 93); in particular,

the work of Ryle (1968/1971) and Geertz (1973/1975) regarding response style designation, of Bernard and Ryan (2010) regarding word count analysis and two-way respondent-by-word matrices, and diagrams proposed by Venn (1880) as the basis for the word maps. The focus of the present discussion is on the import of these methodological developments.

An early methodological development came about in Phase 2 of the data analysis with the creation of the *précis* documents illustrated in Figure 6. Miles and Huberman discuss the importance of implementing flexible methods, of “Trying out” different approaches in working with data in order to be able to “show reduced, focused, organized information” (Miles & Huberman, 1994, pp. 92–93). An early iteration of the *précis* documents involved writing the participants’ responses on sticky notes and placing them on the walls of my apartment, which had the benefit of great ease of moving a given response around for comparison with others’ responses. However, the size of the data set soon became a limitation. Also, I came to see that a major organizing factor was the individual participant rather than the interview question. Instead of manipulating a single piece of paper for a single question response, I converted to using ticker tape so that the single piece of paper would carry all responses for a participant. The final version of the *précis* documents therefore emerged from the concept of making use of ticker tape so that the participants’ words might be captured in one long stream for consideration in their dual nature, being composed of responses to a number of separate questions as well as revealing each participant’s response set as a complete entity. In a different context, the Canadian actor Christopher Plummer describes how one of his teachers, Michael Langham, made the same point regarding soliloquy delivery. Plummer shares that Langham would point out: ““They’re all one thought. All the great soliloquies are one thought. Drive through them smoothly and it’s perfectly clear. But if you try to make every line a gem, you’ll bore us to death”” (Ouzounian, 2012, p. 32). The invention of the *précis* documents not only condensed the data, but also allowed me physically to move the length of paper representing any given participant in order to

compare and contrast the content and style of response between participants on both scales, of the individual interview questions and of the participants' overall perspectives. This proved to be a watershed methodological development that opened the data up for further stages of analysis.

The later phases of analysis involved an increase in innovation regarding methodologies, with a turning point being the designation of response style. As Miles and Huberman state: "You begin with a text, trying out coding categories on it, then moving to identify themes and trends ... aiming first to delineate the 'deep structure'" (Miles & Huberman, 1994, p. 91). If the précis documents allowed the data to be seen at a glance, the deep structure held within the data came to be visible through the designation of response style. As intimated in the work of Ryle and Geertz, the determination of what constitutes a thin or thick response in any given situation is likely to be unique and determined by the perceiver, which in this case falls within the responsibilities of the role of the researcher. In qualitative research, it is the researcher who is the primary instrument of meaning making through processes of teasing out and weaving together information from the data. This process, however, is anything but arbitrary. In creating good qualitative research, flexibility and consistency come to the fore in the process that Robert Stake calls the "creating of meaning" (Stake, 1995, p. 136). Working with the transcripts and précis documents closely showed that what would constitute a thin or thick response, described by which subthemes arose, would need to be determined on a case-by-case basis, resulting in characteristics of response style being unique for each of the interview questions.

An illustration of the unique characteristics of response style is shown in Appendix R, where almost every question has a different number of common and particular subthemes designated to it for both thick and thin response styles. The one exception is that Q3 and Q4 appear to have the same profile of number and type (thick: 2–4; thin: 1) of subthemes for thick and thin responses. However, Appendix S indicates that while both questions make use of nine

different subthemes, only four of those ('action', 'time', 'consequences', 'leadership') are shared by both of the questions, with five other subthemes being different for the two questions (see Appendix S, Tables S3 and S4). Furthermore, of the four shared subthemes, the frequency of use for every one of those subthemes is different between Q3 and Q4. What constituted a thin or thick response regarding the subthemes involved, the number of each type (common or particular), the total number of subthemes, and their frequency of use therefore arose uniquely for each of the ten questions.

A great deal of time was taken in the process of designating the response style, with efforts made to balance between flexibility and consistency. At the outset, when all responses were read for coding for all participants, it was obvious that the majority of subthemes (18 of them) appeared in two or more questions; these were termed the common subthemes. It also became clear that there were 10 other subthemes that arose in the context of a single question response to an extent sufficient to warrant their inclusion; these were termed the particular subthemes. Thomas Schwandt warns against the "tendency to regard codes or categories as 'fixed' or unchanging" (Schwandt, 2001, p. 27). Maintaining consistency in a rigid manner would have meant the loss of significant meaning that the particular subthemes brought to the analysis, especially at the point of designation of response style. This point perhaps also serves to illustrate what Robert Yin refers to as the demanding skills required for this type of research (Yin, 1994, p. 55).

If the emerging prioritization of the participant over the interview question began with the précis documents of Phase 2 analysis, it continued with the word counts and two-way matrices used in Phase 4 analysis. This emphasis is in harmony with Bernard and Ryan's approach, in which "The units of analysis are respondents and the variables are the words they used in their texts" (Bernard & Ryan, 2010, p. 196). The appendices include two-way matrices in half a dozen groupings: five of participant-by-subtheme or -by-question type (Appendices S

through W) and one following subthemes across the ten interview questions (Appendix X). As described in Chapters 4 and 8, the methodology of word counts through tracking subthemes and the data display format of two-way matrices were the most fine-grained in this thesis. In the manner of dots of colour being the essential foundation for a pointillistic image, the word counts and matrices provide the detail necessary to determine the participants' portraits and the four views. This methodology was labour-intensive and necessitated the creation of a number of interconnected tables, where even small changes brought linked repercussions from one table to another. Even with great care taken, such changes may possibly have introduced errata.

Word counts and matrices may place an apparent emphasis on the structure of participants' responses over the content. However, the codes (subthemes) used arose from the words of the participants and thus were themselves a form of content. Putting it another way, the original responses are themselves interpretive (on the participants' part) and thus the subthemes merely represent a continuation of the interpretive process, as indeed Geertz points out: "what we call our data are really our own constructions of other people's constructions of what they ... are up to" (1973/1975, p. 9). Michael Patton describes the use of codes that are at some distance from actual content. He provides an excerpt from a "Codebook for Use by Multiple Coders" to give an insight into how multiple coders might work in a consistent way, understanding and applying the same codes in different circumstances. For instance, under the "characteristics of program evaluated", there were six different codes listed, including "0104: purpose of program; 0105: history of program; 0106: program effectiveness" (Patton, 2002, p. 516), which differed from other codes such as those relating to the purpose of the study "0701: description of purpose" (Patton, 2002, p. 516), or those factors and effects on utilization, such as "1307: point in life of program" (Patton, 2002, p. 517). A comprehensive list of codes such as this is contrasted to other types of coding, which Patton refers to as "first-cut coding examples: sample codes from the field note margins", which include codes such as "Phil" and "Prc", glossed as

“Phil (statements about program philosophy)” or “Prc (examples of program processes)” (Patton, 2002, p. 464). All of the codes Patton touches on, whether as first-cut coding or in tabulated form as a detailed handbook for multiple coders, are *descriptive of* the participants’ words, rather than the words themselves, and are therefore already at some distance from what the participants actually said.

In the word counts and matrices used in this thesis, the codes *were* the words of the participants, or were as close to those words as possible given the need for flexibility in the coding process. This was illustrated in many different circumstances through the results chapters, with three examples following, one from each of the national coordinators, through Chapters 6, 7, and 8. The use of ‘citizen’ as described in Chapter 6:

To educate citizens who will take care of environment, as much as possible (LT-Coord, p. 37).

The use of ‘responsibility’ as described in Chapter 7:

The people with the power to make those types of changes in a school – I think we have a responsibility to provide an opportunity for success for our students (CA-Coord, p. 32).

The use of ‘choices’ and ‘action’ as described in Chapter 8:

To take action to change the world for the better. To make good choices for the future (SV-Coord, p. 10).

The structure or architecture of response portrayed in fine detail in the six appendices of matrices (Appendices S through X) is therefore intimately connected to the content and thus illuminates the meaning shared by the participants. As shared at the outset of Chapter 6, it was American architect Louis Sullivan’s belief that structure reveals meaning as “form ever follows function” (Sullivan, 1896).

The interplay of response architecture and content acts as a central force in this thesis, with architecture being revealed not only by the word counts and matrices but also by the data display format of word maps that provided the visual characterization of a participant's responses in the portraits of Chapter 7. The visual complexity of the word maps not only provided a form of proxy indicator for the stage of the participant, they also shed light on the sustainability perspective of that participant, particularly those in the higher stages with more detailed word maps. Those subthemes made use of in two or more questions, as indicated in bold or capital letters in the overlapping regions of the ellipsoids, provide some degree of insight into those words of particular significance to the participant. For instance, in the Stage 4 portraits, Figure 13 indicates two subthemes repeated across multiple questions by CA-Teach4: 'time' and 'citizen'. Stage 5 portraits include the word map of CA-Admin1 in Figure 16, which indicates four repeated subthemes of 'action', 'time', 'motivation', and 'one person'. Another participant in the same stage, SV-Teach2, includes repetition of three different subthemes, as shown in Figure 20: 'independence', 'leadership', and 'responsibility'. Stage 6 portraits show complex word maps, as in the case of LT-Teach6 seen in Figure 23, with six repeated subthemes of 'action', 'independence', 'time', 'motivation', 'responsibility', 'leadership'. The word maps show at a glance the different subthemes touched on, any repetition of those subthemes, and any commonality of subthemes arising across strands (connection, interpretation, engagement) of question. Like the sustainability perspective of each individual so portrayed, the word map of each participant is unique. Used in conjunction with a discussion of response excerpts, this form of data display has power to reveal additional meaning in the responses shared by participants. As with the other methodological developments discussed in this section, word maps may be of use in the context of others' work to come.

Considering the Results

The sections above outline not only the outcomes of this research and methodological developments that I developed but also those findings shared by the participants themselves regarding both sustainability learning programs and shared characteristics of the people engaged with such programs, termed sustainability chefs. Future research could usefully explore the ‘what’ of these findings as well as the ‘how’ of the methodological developments. This section considers more generally the results of this study, particularly its outcomes. In contrast to the level of detail provided through the results chapters of this thesis, the intention of the approach here is to provide a glimpse at some distance from the minutiae of results.

Regarding the model of sustainability perspectives and the sequence of thick responses for this data set (see Table 5), two aspects of particular significance arise: that of precursors and that of integration. The results of this study provide a strong trend whereby thick responses in the engagement strand of questions are preceded by thick responses in the interpretation strand, which in turn are preceded by thick responses in the connection strand. The term precursor describes the fact, in the context of the data, of thick responses arising in the strands of question in this particular sequence. Future research would be required to determine to what extent this might be the case for individuals of various ages in formal educational settings (schools similar to and different from the ones included here), informal and non-formal educational settings, and even organizations not directly associated with the arena of education. However, the fact that a clear and consistent pattern manifests in the data for the 30 individuals involved in this study, almost all of whom have never been in contact with one another, but rather are bound by some interest in or association with whole-school sustainability programs, is such a strong point that it suggests there may be an underlying driver shaping such a pattern. Exploring such a driver would be of considerable interest. Perhaps a similar pattern to the one revealed here might hold true for others, in other contexts, as well. Certainly there are indications in key areas of the

literature that this might turn out to be the case. For instance, as discussed in Chapter 3, David Orr suggests “[taking] young people out of the classroom to encounter the mystery of the third thing. In that encounter they discover what Rachel Carson once called the ‘sense of wonder.’ And that is the start of a real education” (Orr, n.d.), while Robert Flood argues for “a mode of thinking that keeps people in touch with the wholeness of our existence” (Flood, 2001, p. 142). Finally, as Michael Bonnett puts it, “how we think of nature sets the tone for how we think of reality in general; there is a level at which our relationship with nature sustains us not just physically but cognitively, emotionally and spiritually” (Bonnett, 2000, p. 595).

Individuals interested in shaping a liveable future by definition have as their intention a positive outcome regarding environmental conditions. Given the abundance of information regarding choices that have an impact on the environment, for instance even for what might appear to be straightforward quotidian choices such as which of a selection of light bulbs to choose, a sizeable difficulty appears to be the variety of choice among the ends available. This, however, is not the most significant difficulty, given the even greater conundrum of the choice of means in approaching the various ends. It is all too easy to find oneself in the situation evoked by Dante seven centuries ago:

...I came to my senses within a darkened wood
Where the direct route had become uncertain (Dante Alighieri, c. 1308).

In the context of this research, one question would be: what is an effective way of ensuring action is taken to support a liveable future? A response may be framed given the pattern of precursors; it provides a suggested pathway through what might otherwise appear to be an impenetrably dark forest with no perceptible way forward. The pattern suggests that the way forward regarding a liveable future is not through telling others *what* to do, nor even in explaining *why* they would do what they do. The pattern suggests that the entity most upstream from engagement and interpretation is connection itself, in both senses of connection *to* (the

environment) and connection *with* (concepts). Aspects of this sense of connection are revealed in the long view of participants.

A second significant aspect of the model of sustainability perspectives is that of integration: the strands of connection, interpretation and engagement, and the four views associated with them, cannot be considered as entirely separate entities, given the way they relate to each other. Ensuring the ability to foster and practice the long view in conjunction with the wide, deep and dynamic views would therefore be a turning point in sustainability learning programs and other sustainability efforts. A key point to note regarding such programs is that they will likely be unique in the way that they address the conditions faced and the students engaged at any point in time, rather than relate to a protocol-based approach.

Regarding the oscillating system of views illustrated in Figure 28, points of significance arise concerning the practice of each of the views, their dynamic interactions, and the conditions that arise as a result of their practice. The oscillation of views is portrayed in a general manner in Figure 28; moving through its oscillations constitutes sustainability practice. On the scale of the individual, the views are the building blocks forming that individual's unique sustainability perspective, with sovereignty growing from the seeds of the views. The importance of sovereignty was raised at many points, particularly by the Stage 5 and 6 participants. Along the continuum from the more passive induction of education through the more active experience of learning, authentic sovereignty is fostered wherever the individual makes learning their own and is present whenever quality sustainability learning is taking place. Gaining clarity regarding each of the views and the system of views as a whole requires an individual to engage in sustainability practice, making use of different modalities over time. Although opportunities to practice can be designed to support the development of views in individuals, the work of gaining clarity and moving through the oscillating system of views is ultimately the domain of the individual. In this light, educators would then engage in what Scott and Gough (2003) term

mediation of children's experiences, perhaps evidencing what Thich Nhat Hanh describes: "The true teacher is someone who helps you discover the teacher in yourself" (Hanh, 2011, p. 350).

Of the four views, one around which many programs have been developed over the years that are closely associated with sustainability learning is the long view, with its aspects of topophilia and leadership. There is great value in strengthening and clarifying the views that constitute an individual's sustainability perspective, which may be accomplished through a variety of approaches. A great deal of research has explored the effectiveness of various styles of programs which take students into places of natural beauty for a period of time, or create opportunities of increased proximity to nature on the school site through school ground greening or the use of living systems (rooves or walls to purify water). However, each of these styles of approach may propagate the belief that nature is something to visit, whether on a special trip or on a more regular basis. With a shift in intention, the epiphany that these and other experiences such as mindfulness meditation may instigate is that we *are* nature, as is ultimately every entity we will ever encounter in our experiences on this planet. There is neither difference nor distance between 'us' and 'nature' since these entities, regarded particularly in Western dialectic as separate, are one and the same. This is perhaps the ultimate integration towards which the outcomes and findings of the present study point. This sort of realization shifts the demands on schools from taking students to visit nature at some distance from their usual home on special trips, towards making everyday efforts to connect with nature in the here and now at a range of distances from the individual. Equally significant insights arise given the opportunity to strengthen and clarify each of the other views.

The oscillating system of views is unique in that it illustrates for the first time both the components that make up the views, termed subthemes here, and crucially how the views interact together, in an empirically based finding arising from the subtheme analysis (as presented in Figure 27). The greater clarity afforded through Figure 28 and the discussion around the

oscillating system of views thus offers a possible blueprint for others in their approach to creating a liveable future. Arguably the greatest challenge as well as the greatest reward would be found in operationalizing the integrated nature of the views, where programs would focus on the balanced development of the four views as well as their integration. Many different modes of experiences could usefully be afforded to individuals of all ages, along with the time to reflect and discuss how these experiences help them with the very personal task of clarifying the views that constitute their sustainability perspective. It is for entities at scales from individuals to institutions and perhaps even governments to determine the extent to which they value the development of their sustainability perspectives in order to ensure sufficient time and resources are dedicated to sustainability practice.

An important aspect of an individual's sustainability perspective as the views construct it is that it continues to develop over time and is implemented in countless ways on a daily basis. Sustainability practice goes well beyond the remit and time frame of ordinary schooling. As mentioned in an earlier section of this chapter, the views are in fact inner views of that individual's sustainability framework, with the outer expression being the manner in which that individual lives their life. If an individual's sustainability perspective is unique to that individual and changes over time, particularly given appropriate sustainability practice, how could this be measured? Perhaps evidence might be collected for further insight regarding the realized pursuit of a liveable future, with accompanying indices.

However, a powerful means of measurement regarding an individual's sustainability perspective might be found within individuals themselves, in determining a physiological basis for sustainability cognition. Given that research teams such as those associated with Richard Davidson's work linking the effect of mindfulness meditation practice on brain structure and function have shown that the brain does change in measurable ways (Davidson et al., 2003), then the same may very well be true for sustainability cognition and practice. As thinking is

associated with both the dynamic view and sustainability cognition, exploration of dynamic changes taking place within individuals would provide insight into a strong driver of the oscillating system of views of substantive interest.

This section has considered the results presented in this thesis, in passing touching on some limitations and some implications for future research, policy and practice, to be explored to a greater extent in sections below. An outcome of the research that may prove useful is the characterization of individuals as sustainability chefs: individuals shaping a sustainable future through a living responsiveness to their conditions. Great sustainability learning programs would be well served through a reduced emphasis on perfecting protocol-based approaches and an increased emphasis on the development of the sustainability perspectives of the individuals that make up the program. This emphasis is not without its challenges, yet for those willing and prepared to pursue this path, guidance to be fearless is provided by two great teachers. Roshi Bernie Glassman indicates that the ingredients are always to hand, as would have been appreciated by the man who, had he “gone out fearlessly, he’d have discovered that the streets had everything he needed” (Glassman, 1998, p. 127). Similarly, Julia Child would encourage sustainability chefs to “try new recipes, learn from your mistakes, be fearless, and above all have fun!” (Child, 2006, p. 328).

Critical Evaluation of the Study

A number of features that limit the generalizability of the results from this study centre around a defining quality, which is its scale. In the future, studies might expand on the start made in this research by including a greater number of participants sourced from the larger number of presently certified EcoSchools, as well as conducting interviews at various points over at least one complete academic year, thereby moving forward what in many ways may feel like a snapshot of particular people at a point in time. The following discussion outlines how size

mattered to this study and acted as a limiting factor in both obvious and subtle ways. Some foreseen impacts of size were the limited number of nations that could be involved in the study, the fact that visits could take place only at one point in time rather than with greater longitudinal perspective, and the constraint that only adults were involved in the study as participants. Mark Rickinson has shown in his DPhil (1999) and research (2001) that students and teachers have differing perspectives when it comes to environmental issues. This was not explored in the present study due to ethical review limitations of only interviewing those aged 18 and over. A valuable direction for future research would therefore be to expand the age range of participants in order to engage pupils in ways similar to those discussed by Gayford in 2009.

Far-reaching, unforeseen, and somewhat more subtle effects of scale arose due to the limited number of available schools. At the time of the study's design, in the autumn of 2005, there were only five EcoSchools certified secondary schools in the public sector Toronto District School Board (TDSB) that could be involved in the research itself or in a pilot project designed to inform the research. Of these, one school was not able to participate in the study due to the tragic loss of one of its community members. With such a limited number of schools, the decision was made that the pilot school for the project be selected from outside of the TDSB EcoSchools, meaning that it would be a private sector school in Toronto that had developed its own sustainability learning program. Although this was the best decision that could have been made at the time, it brought with it unforeseen difficulties.

The public and private sector schools could be seen to operate two styles of sustainability programs, contrasting their functionality through bottom-up or top-down processes, respectively. The EcoSchools program found in the public sector schools was initiated by interested teachers within those schools who would engage students. In the private sector school, the principal had tried a bottom-up process through shifting teaching within given departments as well as through the hiring of new teaching staff in those departments. However, over a period of many years this

was perceived to be less than fully effective, which led to engagement in top-down processes of change. This principal had the power to influence the larger community, but more importantly, knew the levers of power within the school, which lay to a great extent with its Board of Governors. The school's board would make essential decisions regarding allocation of major funds to projects, including salaries for additional staff such as sustainability coordinators. It is not appropriate at this point to engage in debate of bottom-up versus top-down sustainability education processes. Rather, the point is to underscore that most of the adult participants in the private sector school used as a pilot for this study had been hired as specialists in sustainability, whereas the participants in the study itself could be seen more as generalists who had a particular interest in ESD, motivating them to engage in the EcoSchools program.

An issue arose at the outset of the research trip which was almost certainly linked to the choice of pilot school. During the interview of the first participant at the first school in Lithuania, it became apparent that the language of the interview questions was problematic to such an extent that the questions would need to be modified before proceeding. The questions had been trialed at the pilot school, approved by the various administrative levels at the university, translated into Lithuanian, reviewed by the national coordinators, and shared with all participants in advance. At no point in this process had problems been detected. As discussed at previous points in this thesis, the issue of language and meaning arose and the decision was made, in consultation with my supervisor, to remove terms from the interview schedule such as “sustainability” and “education for sustainable development”, introducing “liveable future” instead. All participants, Lithuanian and otherwise, were then interviewed with the alternate interview schedule and their responses to these questions provided the primary data for this thesis. The issue of scale, then, can be seen to exert substantial influence on this study.

Finally, the tightest constraint regarding the study was the limited amount of time available to spend with the participants. Two days in each Lithuanian school and one day at each

Swedish school was the norm, while for Canadian schools only a half day was available. This resulted in pair or group interviews where individual interviews would have been preferable, while there was almost no time to make any observations of teaching in action or the tangible results of EcoSchools programs. It was this overarching fact as much as anything that led me to mine the data I was able to gather as deeply as possible, but as with other issues relating to questions of scale, the study was significantly influenced by this constraint.

Future Directions

Research in the future might follow on both from the main outcomes and findings of the present study and from its limitations. Areas of research emerging from its main outcomes and findings would include the fact that the primary data for the present study are statements from interviews, with little link between these statements and what is actually seen to be the case in the participant's school. The possibility of exploring disparities between what participants say and what they do or are able to accomplish practically was beyond the scope of the present study, and so remains a fruitful area for further research. Discovering the extent of harmony between statements and action would be of great interest, as would be the exploration of any gaps between theory and its operationalization, a possible area of significant learning. The intention would be to explore the degree of alignment among what is understood, expressed and acted on. The type of data collected in the future could include evidence of sustainability education at the learning site, providing further background and insight to the participants' statements.

Many of the participants' statements in the present study regarding sustainability efforts in their school portrayed fairly straightforward efforts regarding waste recycling and energy consumption. It would be of interest to find out what sustainability efforts could lie beyond this style of reduction of ecological footprint in schools. In their discussion linking policy and practice of environmental education in England, Gayford and Dillon suggest points that are

relevant here, in that their teacher respondents felt “that the opportunities for less formal involvement with pupils in environmental initiatives were important. The implication is that schools need to consider the whole of their provision in environmental education and to plan accordingly” (Gayford & Dillon, 1995, p. 179).

Useful efforts could also be made by following on from the identification of the connection strand as a precursor for both the interpretation and engagement strands in the model of sustainability perspectives. If connection is a precursor, an exploration as to the means by which this could be fostered in individuals would be important. Further clarity around the links among connection, interpretation and engagement would also be of use. Interest in exploration around the connection strand is not limited to the realm of educators, however. If connection to the environment inevitably leads to a shaping of our thinking about the environment, as shown in the oscillations from the long view through to the dynamic view described in Chapter 8, then further research into the connection strand would lead towards research into sustainability cognition. For an ambitious interdisciplinary study between educators and neuroscientists, pursuing the quantifiable changes and impacts in the human brain regarding sustainability cognition would be important. In a similar vein to the 8-week mindfulness courses designed by Jon Kabat-Zinn, with effects monitored by Richard Davidson and his colleagues, future research questions arise regarding the means by which experienced sustainability learning might illicit observable changes in brain structure and function, as well as how these relate to individuals’ ability to shape a liveable future.

Implications for Future Research

Regarding future research that would follow on from the limitations of the present study, significant features would be to expand the numbers and the age range of participants and to gain a greater longitudinal sense through interviews over a longer period of time. As mentioned in

the section on interviews of the methodology chapter, during the planning phases of this study in the autumn of 2005, there were five certified secondary EcoSchools in the TDSB; by August 2012, the EcoSchools website stated that of all the TDSB schools, 401 were certified to some standard (TDSB, n.d.). This level of expansion is dramatic, making comments by Peter Posch on the ecologization of schools relevant.

In asking the question, “What is innovative in the ecologisation of schools project?”, Posch states three major long-term educational policy developments:

At the level of the individual schools, it is *the step from temporary individual initiatives to ecologically sustainable structures and to a combination of pedagogical, social and technical/economic initiatives....* At the level of the educational system, it is *the step from pilot schools to an inherent feature of the system of education....* At the level of competences, it is *the step from the competences of a minority of teachers and headteachers to an intrinsic professional feature of the teaching profession and of school management* (emphasis in the original; Posch, 1999, pp. 343–344).

Due to the increase in numbers of participating schools, investigation of the role and significance of an ecologisation of schools as found in programs such as that of EcoSchools would now be possible at each of these organizational levels: the school, the system, and the individual, with a starting point for future research being the main outcomes and findings from this study. In focusing on Posch’s final point, just one aspect of this would be to explore means of bringing these concepts into teacher training programs, a subject explored by many researchers (Inman & Champain, 1996; Kyberz-Graber & Robottom, 1999; Summers, Childs & Corney, 2005).

An increase in the longitudinal nature of a comparable study, particularly if it were to include the perspectives of both adults and students, might provide insight into how (and whether) individuals shift from one stage of the model of sustainability perspectives to another. The model as it is presented was developed on the basis of static data, or from snapshots of individuals at one point in time, and data that gave greater insight into the fluid nature of the model would be valuable. In this case, progression between stages might be indicated for

individuals, with the possibility of clarifying both hindrances and catalysts to shifts between stages of the model. The six-stage model of sustainability perspectives portrayed in the present study was developed through interviews with experienced sustainability educators, as all individuals were employed in certified EcoSchools. Interesting results might arise if future work were to pursue similar research in more randomly selected schools in these or in other nations for points of comparison, perhaps even exploring the possibilities of detailing linkages between the macro- and micro-scales of economics and environmental impact, as was an original intention in this study.

Implications for Policy

Since the focus of the key outcomes and findings of this thesis was to a large extent on the individual practitioner, direct implications for policy on sustainability learning are likely to be of a general character. One suggestion, following logically both from the experiences of the ten schools participating in the study and from the evidence regarding successfully ‘green’ schools in the United States and the United Kingdom presented in Chapter 3, is that the most helpful role that government- or board-level policy can play is to enable and support schools in realizing their best sustainability selves, whether through providing guiding frameworks within which schools are encouraged to find their own innovative solutions, or by lowering institutional barriers such as rigid curriculum constraint, administrative silos or top-down program implementation in order to support creative leadership at the school level.

Essential Questions

Whether termed environmental education, ESD, or sustainability learning, work in this field has many different avenues for future explorations. The emphasis should not necessarily be on outlining the breadth of a future research agenda, but rather on the imperative of choosing carefully those few questions about which time will allow an exploration. William Scott gave a

keynote address at the Fourth World Environmental Education Congress in Durban, July 2007, in which he considered the three decades since the ground-breaking Tbilisi Conference. He concluded with an important question:

given all the difficulties the world now faces in relation to development and the environment – and the importance of education in addressing such challenges – what insights does environmental education research provide that will help us? And it is a question that is disturbingly difficult to respond to in a satisfactory fashion, which is why I am presenting it here, rather than answering it myself with any degree of confidence. I do wonder how you would respond.... What *would* we say if our President or Prime Minister gave us three minutes to address this question, and make our points? What would *you* say? (emphasis in the original; Scott, 2009, p. 163).

Perhaps a way of considering the research presented in this dissertation, as well as research that has yet to be developed, is through bearing in mind the finite nature of both our planet and the span of our individual lives as we shape a liveable future. As Matthew Brennan pointed out more than 50 years ago, “If [this] is a way of life, it must be lived throughout the days an individual spends on earth” (Brennan, 1957, p. 243). So often our days pass as if they were but brief moments, making necessary deliberate consideration of the choices available to us in the time we are a part of this environment. Welsh poet Dylan Thomas, in “Fern Hill”, expressed the poignancy associated with the brevity afforded us:

...time allows
In all his tuneful turning so few and such morning songs (Thomas, 1946, p. 66).

Conclusion With Hope

Distinguishing between what might be termed good educational practice and sustainability education considers “broad sustainability education” versus what might be termed “strong sustainability education”. Broad practices would relate to those valid, effective educational practices known to support individuals’ learning and could be found both within and beyond the perspectives of either EE or ESD as identified in Figure 2 of Chapter 3. Strong

sustainability education practices go beyond these broad practices and would include, but not be limited, to fostering:

- holistic perspectives or being able to see the whole board;
- creativity and sustainability cognition;
- active engagement;
- facilitation of collaboration and community-building;
- organic and adaptive responses;
- drawing on and fostering a sense of connection;
- discovery for students and educators to create opportunities for fresh things to happen;
- sovereignty in citizenship;
- appropriate leadership and communication;
- transformative education which seeks paradigm-shifting relationships within the constructs of society, economy and concomitant impact on the environment.

This is not meant to be an exhaustive list, detailing protocols for strong sustainability education, but rather characterizations of what tends to arise when sustainability chefs are at work. Strong sustainability practices would fit within the perspectives circumscribed in Figure 2.

Other qualities often present in sustainability chefs may not be touched on as frequently: love, doubt, and hope. First and foremost in sustainability is a sense of care, which was noted explicitly in the *Sustainable Schools* document by the United Kingdom's Department for Education and Skills (DfES). "So what is a sustainable school? We believe it is one that is guided by the principle of care: care for oneself; care for each other (across cultures, distances and time); care for the environment (far and near)" (DfES, 2006b, p. 4). Although the DfES uses

the word care, others might use love or compassion. At the outset of *The 30-Year Update*, Donella Meadows and her colleagues explicitly touch on this quality of love:

The message [of *The 30-Year Update*] is that if we persist in our pedagogic effort, the world's people will increasingly choose the right way ahead, out of love and respect for their planetary companions, current and future, human and nonhuman. We fervently hope they will do so in time (Meadows et al., 2004, p. xvii).

John Elder, who collaborated with David Sobel on the Nature Literacy Series through the Orion Society, wrote: “Love is where attentiveness to nature starts, and responsibility toward one’s home landscape is where it leads” (Elder, 1998, p. 11). As detailed in Chapter 3, the IUCN has launched a campaign, “Love. Not Loss” (IUCN, n.d. b), that strongly resonates with this sensibility. Action with respect to the environment springs naturally from this sense of care or love and is an awake, living responsiveness to what arises. Ultimately, sustainability is about love. Sustainable choices reflect a love of our great planetary home and ourselves, as expressed through action and informed by the quality of our connection to this Earth and to each other, as well as the style of our thinking. The relationship between individuals and the environment is not only reciprocal; it has a feature of positive feedback as our beings depend upon and are cared for by our environment, accentuated as we return this care.

Of the various factors that may shape the future through engaging with sustainability, doubt may be given the least consideration. In great measure, this may be due to the fact that the presence of doubt is difficult to detect, or when detected, its force or utility may be ignored. We need doubt. In many circumstances doubt serves as a hindrance, undermining thought and action. However, the upside of doubt is that it may allow individuals to remain open to others’ perspective; to listen with discernment for those ways in which their own view may need to shift; to be awake to the possibilities of life lived in intellectual curiosity. More than half a century ago Max Nicholson, along with others such as Sir Julian Huxley, founded a number of organizations that relate to the field of ESD such as the World Wildlife Fund (WWF) and the

IUCN (WWF, n.d. f). Leading up to 1970, a series of significant and relevant conferences took place in the United Kingdom under the rubric of *The Countryside in 1970* (see associated documents: Countryside in 1970, 1964, 1965a, 1965b, 1966, 1970a, 1970b). Nicholson purposefully closed the second day of the Third Conference of *The Countryside in 1970* with a provocative statement weaving together the realms of education, environment and economy:

What makes our movement so exciting and unique ... is that we have recaptured this sense of exploration and of learning together.... No single thing would do more to set right all these troubles ... than if the economists were to go back to school and learn ecology (*The Countryside in 1970*, 1970a, pp. 153–154).

This is a close though presumably unconscious paraphrase of T.S. Eliot's lines from *Burnt Norton*:

...human kind
Cannot bear very much reality (Eliot, 1944, p. 14).

Although Nicholson uses terms such as “economists” and “ecology”, what is infused in his words is the beneficial idea of bringing a sense of uncertainty or simply an open mind to the table when approaching sustainability issues. Doubt or uncertainty are fundamental to the process behind creative endeavours; bringing creativity to the fore would greatly benefit sustainability efforts. Aspects of these points were made in a different context at the outset of this thesis, as Shunryū Suzuki pointed out, “In the beginner's mind there are many possibilities; in the expert's mind there are few” (Suzuki, 1970/2010, p. 2). Every individual engaging in sustainability learning would benefit from remaining a beginner, in this sense.

How is the transition from doubt to hope to be navigated? Denial does not seem a promising way forward. Orr does not smooth over environmental problems, but describes them starkly: “it is too late to avoid trauma but probably not too late to avoid global catastrophe, which includes the possibility of runaway climate change; there are no easy answers or magical solutions; it is truly a global emergency” (Orr, 2007, p. 1392). This is the most relevant type of

situation in which to foster hope, which is different from sheer optimism. Orr contrasts optimism and hope, where:

Optimism is the recognition that the odds are in your favor; *hope* is the faith that things will work out whatever the odds. *Hope* is a verb with its sleeves rolled up.... Authentic hope, in other words, is made of sterner stuff than optimism (emphasis in the original; Orr, 2007, pp. 1392–1393).

It is a lack of this type of faith that things will work out that leads so many individuals to a mind state of utter despair and inaction, rather than finding means of fostering authentic hope. Orr shares,

Hope ... requires us to check our optimism at the door and enter the future without illusions. It requires a level of honesty, self-awareness, and sobriety that is difficult to summon and sustain. I know a great many smart people and many very good people, but I know far fewer people who can handle hard truth gracefully without despairing (Orr, 2007, p. 1393).

In refusing to soften the message of the difficulties regarding the environment, Orr does not make hope less relevant, but in fact aligns hope with the conditions faced. In doing so he understands that it is useful to awaken hope, particularly in the most challenging times. Educators are uniquely positioned to aid in this shift.

The nature and role of hope in guiding efforts in sustainability learning has been touched on throughout this thesis. At this point, different but equally useful perspectives regarding hope are presented which may guide future directions. E.F. Schumacher gave a short speech at the Third Conference of *The Countryside in 1970*. He responded to some admonishment that the tone of the meeting needed to move from the negative to the positive. With that, he said:

What is the positive message that should come from a conference like this? Surely, it cannot be that economic growth is primary and the environment secondary. Here I am speaking as a professional economist: I do not think these two things need to be in conflict; I think the positive message that has to be given is that science and technology must re-orientate themselves in a new direction with a new responsibility (*The Countryside in 1970*, 1970a, p. 140).

This is a message of hope, since implicit in Schumacher's statement is that this reorientation, if difficult, is possible. From a different but not incompatible tradition, the Zen master and writer Thich Nhat Hanh warns about an over-reliance on hope:

Hope is important, because it can make the present moment less difficult to bear. If we believe that tomorrow will be better, we can bear a hardship today. But that is the most that hope can do for us – to make some hardship lighter. When I think deeply about the nature of hope, I see something tragic. Since we cling to our hope in the future, we do not focus our energies and capabilities on the present moment. We use hope to believe something better will happen in the future.... Hope becomes a kind of obstacle. If you can refrain from hoping, you can bring yourself entirely into the present moment and discover [what] is already here.... I do not mean that you should not have hope, but that hope is not enough. Hope can create an obstacle for you, and if you dwell in the energy of hope, you will not bring yourself back entirely into the present moment (Hanh, 1992, pp. 41–42).

Hanh's words suggest that clear-sighted understanding of hope can be used to motivate into engagement with the reality of circumstances faced, rather than relying on hope as a crutch or panacea. The Canadian writer and radio broadcaster Stuart McLean spoke about the nature of hope in a world of realism:

It's not said enough, and I'll say it again: The world is a good place, full of good people. And when we act out of that, when we act out of hope and optimism and faith in our fellow man, we act out of our best selves, and we are capable of doing great things – of contributing to the greater good. Hope and optimism are not synonymous with naïvety. We should be looking into the future with flinty and steely eyes, for sure. But they should be wide open with hope, not squinting in fear (McLean, 25 September, 2008, starting from minute 4.37).

McLean's message is relevant to those working in a field that relates to the environment as so often individuals' thinking and action are strongly influenced by their fears. His guidance points to the available choice of operating in a framework of grounded hope. As American educator William Bigelow points out, "The irony is simply this: Horror and disgust at injustice can turn to hope when individuals of conscience find one another and begin to act on their common commitments" (Bigelow, 2002, pp. 333–334). Bigelow's words are a reminder to take action and to remember the value of action in community.

Although children have been absent in an explicit sense from this thesis, they are most certainly at the core of the intentions behind this study. It seems appropriate that the final words be those of a child. A different way of framing the importance of hope comes from the fresh perspective of a girl in Grade 5:

Hope is a big pink ice cream cone
That sometimes melts
Taking its chances, always (Schwarzwald, 1996, p. 28).

References

- Adey, P., & Shayer, M. (1990). Accelerating the development of formal thinking in middle and high school pupils. *Journal of Research in Science Teaching*, 27(3), 267–285.
- Adey, P., Csapó, B., Demetriou, A., Hautamäki, J., & Shayer, M. (2007). Can we be intelligent about intelligence? Why education needs the concept of plastic general ability. *Educational Research Review*, 2, 75–97.
- Ajzen, I., & Fishbein, M. (1970). The prediction of behavior from attitudinal and normative variables. *Journal of Experimental Social Psychology*, 6, 466–487.
- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84(5), 888–918.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Almers, E. (2013). Pathways to action competence for sustainability—six themes. *The Journal of Environmental Education*, 44(2), 116–127.
- Alsop, S., & Bencze, J. L. (2010). Introduction to the special issue on activism: SMT education in the claws of the Hegemon. *Canadian Journal of Science, Mathematics and Technology Education*, 10(3), 177–196.
- Alsop, S., & Bencze, J. L. (2012). In search of activist pedagogies in SMTE. *Canadian Journal of Science, Mathematics and Technology Education*, 12(4), 394–408.
- Alsop, S., & Pedretti, E. (2001). Science technology society. In S. Alsop & K. Hicks, *Teaching science: A handbook for primary and secondary school teachers* (pp. 193–205). London: Kogan Page Limited.
- Argyris, C., & Schön, D. (1978). *Organisational learning: A theory of action perspective*. Reading, MA: Addison-Wesley.

- Arrow, K., Bolin, B., Costanza, R., Dasgupta, P., Folke, C., Holling, C. S., et al. (1995). Economic growth, carrying capacity, and the environment. *Science*, 268(5210), 520–521.
- Bai, H. (2001). Beyond the educated mind: Towards a pedagogy of mindfulness. In B. Hocking & J. Haskell, W. Linds (Eds.). *Unfolding bodymind: Exploring possibility through education* (pp. 86–99). Brandon, VT: Foundation for Educational Renewal.
- Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, 27, 14–25.
- Bánáthy, B. (1997). A taste of systemics. Retrieved on 18 December 2012 from http://www.newciv.org/ISSS_Primer/ase04bb.html
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychological Review*, 84(2), 191–215.
- Barber, J. (2011). *CSD-19 hits a wall: No final decision*. WSSD-education caucus, listserv posting, 17 May 2011.
- Barlow, Z. (2009). Preface. In M. K. Stone & Center for Ecoliteracy, *Smart by nature: Schooling for sustainability* (p. viii). Healdsburg, CA: Watershed Media.
- Barratt Hacking, E., Scott, W. A. H., & Barratt, R. (2007). Engaging children: Research issues around participation and environmental learning. *Environmental Education Research*, 13(4), 529–544.
- Bateson, G. (1979). *Mind and nature: A necessary unity*. New York: Dutton.
- Bateson, G. (1972/2000). *Steps to an ecology of mind*. Chicago: The University of Chicago Press.
- Bateson, M. C. (2000). Foreword. In G. Bateson, *Steps to an ecology of mind* (pp. vii–xv). Chicago: The University of Chicago Press.

Bennett, L. (2009). Where teaching and learning come alive. In M. K. Stone & Center for Ecoliteracy, *Smart by nature: Schooling for sustainability* (pp. 151–187). Healdsburg, CA: Watershed Media.

Bernard, H. R., & Ryan, G. W. (2010). *Analyzing qualitative data: Systematic approaches*. Los Angeles, CA: Sage Publications, Inc.

Berry, T. (2000). *The great work: Our way into the future*. New York: Broadway Books.

Bigelow, W. (1996). How my schooling taught me contempt for the earth. *Rethinking Schools*, 11(1) (Fall 1996), 14–17.

Bigelow, W. (2002). Defeating despair. In W. Bigelow & B. Peterson (Eds.). *Rethinking globalization: Teaching for justice in an unjust world*. Milwaukee, WI: Rethinking Schools.

Björneloo, I., & Nyberg, E. (Eds.) (2007). *Drivers and barriers for implementing learning for sustainable development in pre-school through upper secondary and teacher education*. Paris: UNESCO.

Blake, W. (1808/1958). *William Blake: Poems and letters selected by Jacob Bronowski*. Harmondsworth, UK: Penguin Books Limited.

Bonnett, M. (1983). Education in a destitute time (A Heideggarian approach to the problem of education in the age of modern technology). *Journal of Philosophy of Education*, 17(1), 21–33.

Bonnett, M. (1994). *Children's thinking: Promoting understanding in the primary school*. London: Cassell.

Bonnett, M. (2000). Environmental concern and the metaphysics of education. *Journal of Philosophy of Education*, 34(4), 591–602.

Bonnett, M. (2001). Martin Heidegger, 1889–1976. In J. Palmer (Ed.), *Fifty modern thinkers on education: From Piaget to the present* (pp. 23–28). Abingdon, UK: Routledge.

Bonnett, M. (2002a). Education for sustainability as a frame of mind. *Environmental Education Research*, 8(1), 9–20.

Bonnett, M. (2002b). Sustainability as a frame of mind – and how to develop it. *The Trumpeter*, 18(1), 1–9.

Boulding, K. E. (1966). The economics of the coming Spaceship Earth. In H. Jarrett (Ed.), *Environmental quality in a growing economy: Essays from the 6th RFF*. Baltimore, MD: Resources for the Future/The Johns Hopkins University Press.

Bradbury, H. (2001). *Learning with the natural step: Action research to promote conversations for sustainable development*. London: Sage Publications.

Bradbury, H., & Reason, P. (2001). Conclusion. In P. Reason & H. Bradbury (Eds.), *Handbook of action research: Participative inquiry and practice* (pp. 447–455). London: Sage Publications.

Breiting, S. (2008). Mental ownership and participation for innovation in environmental education and education for sustainable development. In A. Reid, B. B. Jensen, J. Nikel, & V. Simovska (Eds.), *Participation and learning: Perspectives on education and the environment, health and sustainability* (pp. 159–180). New York: Springer.

Breiting, S., & Janniche, P. M. (1995). *MUVIN-DK: Background information for schools in Denmark participating in “Nordic environmental education” in 1994/96*. Copenhagen: Royal Danish School of Educational Studies.

Breiting, S., Mayer, M., & Mogensen, F. (2005). *Quality criteria for ESD-schools: Guidelines to enhance the quality of education for sustainable development*. Vienna: Austrian Federal Ministry of Education, Science and Culture.

Breiting, S., & Mogensen, F. (1999). Action competence and environmental education. *Cambridge Journal of Education*, 29(3), 349–353.

Brennan, M. J. (1957). Conservation for youth. *Bulletin of the Massachusetts Audubon Society*, 41(5) (May 1957), 243–250.

Brennan, M. J. (1964/1974). Total education for the total environment. Speech given at the annual meeting of the American Nature Study Society (AAAS) on the historic program of the Pinchot Institute for Studies in Conservation, Montreal, Canada, 29 December, 1964. Reprinted in *The Journal of Environmental Education*, 6(1), 16–19.

Bright, A. D., & Tarrant, M. A. (2002). Effect of environment-based coursework on the nature of attitudes toward the endangered species act. *The Journal of Environmental Education*, 33(4), 10–19.

Brown, L. R. (2002). Water deficits growing in many countries: Water shortages may cause food shortages. In *Eco-Economy Update* (pp. 2–3). Washington, DC: Earth Policy Institute.

Brown, L. R., Gardner, G., & Halweil, B. (1998). *Beyond Malthus: Sixteen dimensions of the population problem* (Worldwatch Paper 143). Washington, DC: Worldwatch Institute.

Burns, D. P., & Norris, S. P. (2012). Activist environmental education and moral philosophy. *Canadian Journal of Science, Mathematics and Technology Education*, 12(4), 380–393.

Capra, F. (1982). *The turning point: Science, society, and the rising culture*. New York: Simon and Schuster.

Capra, F. (1997). *The web of life: A new scientific understanding of living systems*. New York: Anchor Books.

Capra, F. (2004). *The hidden connections: A science of sustainable living*. New York: Anchor Books.

Capra, F. (2005a). Preface: How nature sustains the web of life. In M. K. Stone & Z. Barlow (Eds.), *Ecological literacy: Educating our children for a sustainable world* (pp. xiii–xv). San Francisco: Sierra Club Books.

Capra, F. (2005b). Speaking nature's language: Principles for sustainability. In M. K. Stone & Z. Barlow (Eds.), *Ecological literacy: Educating our children for a sustainable world* (pp. 18–29). San Francisco: Sierra Club Books.

Carmi, N. (2012). Caring about tomorrow: Future orientation, environmental attitudes and behaviors. *Environmental Education Research*, DOI: 10.1080/13504622.2012.700697

Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, knowledge and action research*. London: The Falmer Press.

Carson, R. (1962/2002). *Silent spring* (Anniversary ed.). Boston: Houghton Mifflin.

Carson, R. (1965). *The sense of wonder*. New York: Harper and Row, Publishers, Inc.

Champain, P. (1996). Why bother with environmental education? In S. Inman & P. Champain (Eds.), *Thinking futures: Environmental education in initial teacher training, a handbook for educators* (pp. 13–29). Godalming, UK: World Wildlife Fund (WWF).

Chan, K. K. W. (1996). Environmental attitudes and behaviour of secondary school students in Hong Kong. *The Environmentalist*, 16, 297–306.

Chan, K. K. W. (1999). Mass media and environmental knowledge of secondary school students in Hong Kong. *The Environmentalist*, 19(2), 85–97.

Chapman, D. J. (1999). So you want to teach for the environment.... *Environmental Education Research*, 5(3), 267–272.

Chawla, L. (1999). Life paths into effective environmental action. *The Journal of Environmental Education*, 31(1), 15–26.

Cheng, J., & Monroe, M. (2012). Connection to nature: Children's affective attitude toward nature. *Environment and Behavior*, 44(1), 31–49.

- Child, J., with Prud'homme, A. (2006). *My life in France*. New York: Anchor Books.
- Child, J., Bertholle, L., & Beck, S. (1961/2001). *Mastering the art of French cooking* (40th Anniversary ed., Vol. 1). New York: Alfred A. Knopf.
- Clark, W.B. (1969). "The environmental education banner." Address to the Governor's Environmental Education Conference, Boise, Idaho, March 1969. Reprinted in *Environmental Education*, 1(1), 7–10.
- Cobb, C., Halstead, T., & Rowe, J. (1995). If the GDP is up, why is America down? *The Atlantic Monthly*, October 1995, 276(4), 59–78.
- Cobb, E. (1959). The ecology of imagination in childhood. *Daedalus*, 88(3), 537–548.
- Cobb, E. (1977). *The ecology of imagination in childhood*. New York: Columbia University Press.
- Comnes, L. (2005). Revolution step-by-step: On building a climate for change. In M. K. Stone & Z. Barlow (Eds.), *Ecological literacy: Educating our children for a sustainable world* (pp. 135–148). San Francisco: Sierra Club Books.
- Cooke, A. (1980). *The Americans: Letters from America on our life and times, 1969–1979*. Harmondsworth, UK: Penguin Books.
- Costanza, R. (Ed.) (1991). *Ecological economics: The science and management of sustainability*. New York: Columbia University Press.
- Costanza, R. (2003). The early history of *Ecological Economics* and the International Society for Ecological Economics (ISEE). Published by the International Society for Ecological Economics, *Internet Encyclopedia of Ecological Economics*.
- Costanza, R., & Daly, H. E. (1987). Toward an ecological economics. *Ecological Modelling*, 38(1–2), 1–7.
- Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., et al. (1997). The value of the world's ecosystem services and natural capital. *Nature*, 387, 253–260.

Costanza, R., Hart, M., Posner, S., & Talberth, J. (2009). Beyond GDP: The need for new measures of progress. *The Pardee Papers*, 4, 46.

Costanza, R., Stern, D. I., Fisher, B. P., He, L., & Ma, C. (2004). Influential publications in ecological economics: A citation analysis. *Ecological Economics*, 50 (2004), 261–292.

Countryside in 1970 (1964). *The Countryside in 1970, Proceedings of the Study Conference held at Fishmongers' Hall, London, EC4, 4–5 November, 1963*. London: Her Majesty's Stationery Office.

Countryside in 1970 (1965a). *Proceedings of the Conference on Education, University of Keele, Staffordshire, 26–28 March, 1965*. London: Nature Conservancy.

Countryside in 1970 (1965b). *The Countryside in 1970, Second Conference, Report of the preparatory study for Study Group No. 2*. London: Royal Society of Arts.

Countryside in 1970 (1966). *The Countryside in 1970, Second Conference Proceedings, London, 10–12 November, 1965*. London: Royal Society of Arts, Nature Conservancy, Council for Nature.

Countryside in 1970 (1970a). *The Countryside in 1970. Third Conference Proceedings, London, 26–28 October, 1970*. London: Royal Society of Arts.

Countryside in 1970 (1970b). *The Countryside in 1970, Third Conference: Reports of advisory committees and groups, London, 26–28 October, 1970*. London: Royal Society of Arts.

Dalai Lama Center (2006). [Dialogue on happiness]. Retrieved on 17 December 2012 from <http://dalailamacenter.org/events/past?page=4>

Daly, H. E. (1973). *Toward a steady-state economy*. San Francisco: W. H. Freeman.

Daly, H. E. (1990). Toward some operational principles of sustainable development. *Ecological Economics*, 2(1), 1–6.

Daly, H. E. (2008). *A steady-state economy*. Presentation to the Sustainable Development Commission [UK], 24 April 2008. Retrieved on 14 December 2012 from http://steadystaterevolution.org/files/pdf/Daly_UK_Paper.pdf

Daly, H. E., & Farley, J. (2004). *Ecological economics: Principles and applications*. Washington, DC: Island Press.

Dante Alighieri (circa 1308). Inferno, Canto I. In *La Divina Commedia*. Florence, Italy: Author.

Darner, R. L. (2007). *The use of self-determination theory to foster environmental motivation in an environmental biology course*. Unpublished doctoral dissertation for joint doctoral program in Mathematics and Science Education at the University of California, San Diego and San Diego State University, San Diego, CA.

Darner, R. L. (2009). Self-determination theory as a guide to fostering environmental motivation. *The Journal of Environmental Education*, 40(2), 39–49.

Davidson, R. J. (2003). Affective neuroscience and psychophysiology: Toward a synthesis. *Psychophysiology*, 40 (2003), 655–665.

Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, 65(4), 564–570.

Davis, J. L., Green, J. D., & Reed, A. (2009). Interdependence with the environment: Commitment, interconnectedness, and environmental behavior. *Journal of Environmental Psychology*, 29, 173–180.

Davis, J. L., Le, B., & Coy, A. E. (2011). Building a model of commitment to the natural environment to predict ecological behavior and willingness to sacrifice. *Journal of Environmental Psychology*, 31, 257–265.

DCSF (Department for Children, Schools and Families, UK) (2009). *s3: Sustainable school self-evaluation: Driving school improvement through sustainable development*.

Annesley, UK: Author.

Denzin, N. K., & Lincoln, Y. S. (Eds.) (1994). *Handbook of qualitative research*. London: Sage Publications.

Denzin, N. K., & Lincoln, Y. S. (Eds.) (2008). *Strategies of qualitative inquiry* (3rd ed.). London: Sage Publications.

DfES (Department for Education and Skills, UK) (2003). *Every child matters: Green paper*. London: The Stationery Office.

DfES (2006a). *s3: Sustainable school self-evaluation, for primary, middle and secondary schools*. Annesley, UK: Author.

DfES (2006b). *Sustainable schools for pupils, communities and the environment: Consultation Paper*. Annesley, UK: Author.

DfES (2006c). *Sustainable schools for pupils, communities and the environment: Government response to the consultation on the Sustainable Schools strategy*. Annesley, UK: Author.

Dietz, S., & Stern, N. (2008). Why economic analysis supports strong action on climate change: A response to the *Stern Review*'s critics. *Review of Environmental Economics and Policy*, 2(1), 94–113.

Dillon, J. (2003). On learners and learning in environmental education: Missing theories and ignored communities. *Environmental Education Research*, 9(2), 215–226.

Dinda, S. (2004). Environmental Kuznets curve hypothesis: A survey. *Ecological Economics*, 49(4), 431–455.

Disinger, J. F. (1983/1997). Environmental education's definitional problem. Published with epilogue 1997, in *ERIC/SMEAC Information Bulletin*.

Earth Charter Initiative (2000). *The Earth Charter: Values and principles for a sustainable future*. Retrieved on 14 December 2012 from http://www.earthcharterinaction.org/invent/images/uploads/echarter_english.pdf

Earth Charter Initiative (2011). *EC+10 Report*. Retrieved on 14 December 2012 from <http://www.earthcharterinaction.org/content/articles/647/1/EC10-Report/Page1.html>

Economist (n.d.). Many “mays” but few “musts”. *The Economist* (Print edition: 23 June 2012; retrieved on 29 January 2012 from <http://www.economist.com/node/21557314>)

Eco-Schools [England] (n.d.). [School search]. Retrieved on 17 December 2012 from <http://www.keepbritaintidy.org/ecoschools/schoolsearch>

Edmondson, Y. H. (1971). Some components of the Hutchinson legend. *Limnology and Oceanography*, 16(2), 157–163.

Ehrlich, P. (1968/1971). *The population bomb*. New York: Buccaneer Books, 1971.

Ehrlich, P. R., & Holdren, J. P. (1971). Impact of population growth. *Science*, 171(3977), 1212–1217.

Ekins, P. (1997). The Kuznets curve for the environment and economic growth: Examining the evidence. *Environment and Planning A*, 29(5), 805–830.

Elder, J. (1998). Introduction. In The Orion Society, *Stories in the land: A place-based environmental education anthology* (pp. 1–15). Great Barrington, MA: The Orion Society. Retrieved on 19 December 2012 from <http://www.orionmagazine.org/i/documents/SIL-complete.pdf>

Eliot, T. S. (1944). Burnt Norton. In *Four Quartets* (pp. 13–18). London: Faber and Faber.

Elliott, J. (1999). Sustainable society and environmental education: Future perspectives and demands for the educational system. *Cambridge Journal of Education*, 29(3), 325–340.

Emerson, J., Esty, D. C., Levy, M. A., Kim, C. H., Mara, V., de Sherbinin, A., & Srebotnjak, T. (2010). *2010 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law and Policy.

Ernst, J., & Monroe, M. (2004). The effects of environment-based education on students' critical thinking skills and disposition toward critical thinking. *Environmental Education Research, 10*(4), 507–522.

Ernst, J., & Theimer, S. (2011). Evaluating the effects of environmental education programming on connectedness to nature. *Environmental Education Research, 17*(5), 577–598.

Esty, D. C., Levy, M., Srebotnjak, T., & de Sherbinin, A. (2005). *2005 Environmental Sustainability Index: Benchmarking national environmental stewardship*. New Haven, CT: Yale Center for Environmental Law and Policy.

Ettinger, B. (Producer), & Huseby, S. (Co-producer, presenter) (2009). *A sea change*. Oley, PA: Bullfrog Films.

Federico, C., Cloud, J., Byrne, J., & Wheeler, K. (2003). Kindergarten through twelfth-grade education for sustainability. *Environmental Law Reporter News and Analysis, 33*(2), 10117–10131.

FEE (Foundation for Environmental Education) (n.d.) Our history. Retrieved on 25 October 2012 from <http://www.fee-international.org/en/Menu/Our+history>

Fielding, K. S., & Head, B. W. (2012). Determinants of young Australians' environmental actions: The role of responsibility attributions, locus of control, knowledge and attitudes. *Environmental Education Research, 18*(2), 171–186.

Fien, J. (2003). Learning to care: Education and compassion. *The Australian Journal of Environmental Education, 19*, 1–14.

Filho, W. L. (1996). An overview of current trends in european environmental education. *The Journal of Environmental Education, 28*(1), 5–10.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Flood, R. L. (1999). *Rethinking the fifth discipline – Learning within the unknowable*. London: Routledge.

Flood, R. L. (2001). The relationship of ‘systems thinking’ to action research. In P. Reason & H. Bradbury, *Handbook of action research: Participative inquiry and practice* (pp. 133–144). London: Sage Publications.

Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C.S., Walker, B., et al. (2002). *Resilience and sustainable development: Building adaptive capacity in a world of transformations*. Stockholm, Sweden: Ministry of the Environment.

Forrester, J. W. (1971). *World dynamics*. Cambridge, MA: Wright-Allen Press.

Forrester, J. W. (1992). *System dynamics and learner-centered-learning in kindergarten through 12th grade education*. Retrieved on 13 December 2012 from <http://clexchange.org/ftp/documents/Roadmaps/RM1/D-4337.pdf>

Forster, E. M. (1910/1989). *Howards End*. London: Penguin Group.

Foster, J. (2005). Options, sustainability policy and the spontaneous order. *Environmental Education Research*, 11(1), 115–135.

Fuller, B., & Snyder, J. (1969). *Operating manual for Spaceship Earth: A bold blueprint for survival that diagnoses the causes of the environmental crisis*. Carbondale, IL: Southern Illinois University Press.

Galbraith, J. K. (1958/1998). *The affluent society* (40th Anniversary ed.). New York: Houghton Mifflin Company.

Gayford, C. G. (2009). *Learning for sustainability: From the pupils’ perspective: A report of a three-year longitudinal study of 15 schools from June 2005 to June 2008*. Godalming, UK: World Wildlife Fund (WWF).

Gayford, C. G., & Dillon, P. J. (1995). Policy and the practice of environmental education in England: A dilemma for teachers. *Environmental Education Research*, 1(2), 173–183.

Geertz, C. (1973/1975). *The interpretation of cultures: Selected essays*. London: Hutchinson.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. London: Weidenfeld and Nicolson.

Glassman, B. (1998). *Bearing witness: A Zen master's lessons in making peace*. New York: Bell Tower.

Glassman, B., & Fields, R. (1996). *Instructions to the cook: A Zen master's lessons in living a life that matters*. New York: Bell Tower.

Glesne, C., & Peshkin, A. (1992). *Becoming qualitative researchers*. White Plains, NY: Longman.

Goldstein, J. (2002). *One dharma: The emerging Western Buddhism*. New York: HarperCollins Publishers, Inc.

Gore, A. (2006). *An inconvenient truth: The planetary emergency of global warming and what we can do about it*. Emmaus, PA: Rodale.

Gottlieb, R. S. (Ed.) (2004). *This sacred Earth: Religion, nature, environment* (2nd ed.). New York: Routledge.

Gough, S. (2002). Whose Gap? Whose Mind? Plural rationalities and disappearing academics. *Environmental Education Research*, 8(3), 273–282.

Greig, S., Pike, G., & Selby, D. (1989). *Greenprints for changing schools*. London: Co-published by the World Wide Fund for Nature and Kogan Page.

Gruenewald, D. A., & Smith, G. A. (2008). *Place-based education in the global age: Local diversity*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Gunderson, L. H., & Holling, C. S. (2002). *Panarchy: Understanding transformations in human and natural systems*. Washington, DC: Island Press.

Hanh, T. N. (1992). *Peace is every step: The path of mindfulness in everyday life*. New York: Bantam Books.

Hanh, T. N. (1993). *Interbeing: Fourteen guidelines for engaged Buddhism* (Rev. ed., F. Eppsteiner, Ed.). Berkeley, CA: Parallax Press.

Hanh, T. N. (2011). *Your true home: The everyday wisdom of Thich Nhat Hanh* (M. McLeod, Ed.). Boston: Shambhala Publications Inc.

Hardin, G. (1968). The tragedy of the commons. *Science*, 162(3859), 1243–1248.

Hart, P., & Nolan, K. (1999). A critical analysis of research in environmental education. *Studies in Science Education*, 34, 1–69.

Hazlitt, W. (1814/1889). *William Hazlitt, essayist and critic: Selections from his writings, with a memoir, biographical and critical*. A. Ireland (Ed.). London: Frederick Warne and Co.

HDR (Human Development Reports) (n.d.). *International human development indicators*. Retrieved on 18 December 2012 from <http://hdrstats.undp.org/en/indicators/default.html>

Head-Royce School (n.d). [About HRS]; [Principles of good practice]; [Mission and programs]. Retrieved on 17 December 2012 from <http://www.headroyce.org/page.cfm?p=2264>, <http://www.headroyce.org/page.cfm?p=51> and <http://www.headroyce.org/page.cfm?p=3256>

Head-Royce School & Center for Ecoliteracy (2009). *Using partnerships to cultivate Eco-schools*. Conference presentation at the National Association of Independent Schools (NAIS), February 2009. Retrieved on 18 December 2012 from <http://www.headroyce.org/uploaded/eLines/HeadRoyce-Ecoliteracy-09AC-Website.pdf>

- Heidegger, M. (1927/1962). *Being and time* (J. Macquarrie & E. Robinson, Trans.). London: SCM Press.
- Heidegger, M. (1939/1998). On the essence and concept of 'nature' in Aristotle's *Physics*, Book I. In W. McNeill (Trans., Ed.), *Pathmarks* (pp. 183–230). Cambridge: Cambridge University Press.
- Heidegger, M. (1954/1968). *What is called thinking* (J. G. Gray, Trans.). London: Harper and Row.
- Heimlich, J. E., & Ardoin, N. M. (2008). Understanding behavior to understand behavior change: A literature review. *Environmental Education Research*, 14(3), 215–237.
- Helliwell, J. F. (2003). How's life? Combining individual and national variables to explain subjective well-being. *Economic Modelling*, 20 (2003), 331–360.
- Henderson, K., & Tilbury, D. (2004). *Whole-school approaches to sustainability: An international review of sustainable school programs*. Report Prepared by the Australian Research Institute in Education for Sustainability (ARIES) for the Department of the Environment and Heritage, Australian Government.
- Herzog, W. (Director, executive producer, writer) (2011). *Cave of forgotten dreams: Mankind's lost masterpiece... in 3D*. New York: Sundance Selects.
- Hines, J. M., Hungerford, H. R., & Tomera, A. N. (1986). Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. *The Journal of Environmental Education*, 18(2), 1–8.
- Hodson, D. (2003). Time for action: Science education for an alternative future. *International Journal of Science Education*, 25(6), 645–670.
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4, 1–23.

Holling, C. S., & Walker, B. (2003). *Resilience defined*. Published by the International Society for Ecological Economics, *Internet Encyclopedia of Ecological Economics*.

Holstein, J. A., & Gubrium, J.F. (2001). Active interviewing. In D. Weinberg, *Qualitative research methods* (pp. 112–126). Malden, MA: Blackwell Publishing Ltd.

Homer-Dixon, T. F. (1999). *Environment, scarcity, and violence*. Princeton, NJ: Princeton University Press.

Homer-Dixon, T. F. (2000). *The ingenuity gap: How can we solve the problems of the future?* New York: Alfred A. Knopf, Inc.

Hsu, S.-J. (2004). The effects of an environmental education program on responsible environmental behavior and associated environmental literacy variables in Taiwanese college students. *The Journal of Environmental Education*, 35(2), 37–48.

Hsu, S.-J., & Roth, R. E. (1999). Predicting Taiwanese secondary school teachers' responsible environmental behavior through environmental literacy variables. *The Journal of Environmental Education*, 30(4), 11–18.

Huberman, A. M., & Miles, M. B. (1994). Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research*, Chapter 27. London: Sage Publications.

Huckle, J. (2006). *A UK indicator of the impact of formal learning on knowledge and awareness of sustainable development*. UK: Sustainable Development Commission.

Huckle, J., & Sterling, S. (1996). *Education for sustainability*. London: Earthscan Publications Limited.

Hume, D. (1751/2004). *An enquiry concerning the principles of morals*. Amherst, NY: Prometheus Books.

Hungerford, H. R., & Tomera, A. N. (1985). *Science methods for the elementary school*. Champaign, IL.: Stipes Publishing Co.

Inman, S., & Champain, P. (1996). *Thinking futures: Environmental education in initial teacher training: A handbook for educators*. Godalming, UK: World Wildlife Fund (WWF).

IPCC (Intergovernmental Panel on Climate Change) (2007). *Fourth assessment report: Climate change 2007 (AR4): Synthesis report*. Geneva: Author.

IPCC (n.d.). [The IPCC]. Retrieved on 19 December 2012 from <http://www.ipcc.ch/organization/organization.shtml>

IUCN (International Union for Conservation of Nature) (1970). *Tenth General Assembly, Vigyan Bhavan, New Delhi, 24 November–1 December 1969. Volume II: Proceedings and summary of business*. Morges, Switzerland: Author.

IUCN (n.d. a). *About IUCN*. Retrieved on 17 December 2012 from <http://www.iucn.org/about/>

IUCN (n.d. b.). *Love. Not Loss*. Retrieved on 24 January 2014 from http://www.iucn.org/about/union/commissions/cec/cec_how_we_work/love__not_loss_/

Jensen, B. B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental Education Research*, 8(3), 325–334.

Jensen, B. B. (2005). *Building capacity and empowerment through ESD*. Conference report on Education for Sustainable Development, May 2005 in Esbjerg, Denmark. Vienna: Austrian Federal Ministry of Education, Science and Culture.

Kabat-Zinn, J. (2005). *Coming to our senses: Healing ourselves and the world through mindfulness*. New York: Hyperion.

Kahneman, D., Krueger, A.B., Schkade, D., Schwarz, N., & Stone, A. A. (2006). Would you be happier if you were richer? A focusing illusion. *Science*, 312(5782), 1908–1910.

Kaiser, F. G., Oerke, B., & Bogner, F. X. (2007). Behavior-based environmental attitude: Development of an instrument for adolescents. *Journal of Environmental Psychology*, 27, 242–251.

Kaiser, F. G., Wölfling, S., & Fuhrer, U. (1999). Environmental attitude and ecological behavior. *Journal of Environmental Psychology, 19*, 1–19.

Kaplan, R. (1984). Impact of urban nature: A theoretical analysis. *Urban Ecology, 8* (1984), 189–197.

Kaplan, R., & Kaplan, S. (2011). Anthropogenic/anthropogenerous: Creative environments that help people create better environments. *Landscape and Urban Planning, 100*, 350–352.

Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology, 15*, 169–182.

Keeling, C. D., Bacastow, R. B., Bainbridge, A. E., Ekdahl, C. A., Jr., Guenther, P. R., & Waterman, L. S. (1976). Atmospheric carbon dioxide variations at Mauna Loa Observatory, Hawaii. *Tellus, 28*(6), 538–551.

Keep Sweden Tidy (n.d.). *Sustainable development in schools and preschools*. Retrieved on 17 December 2012 from <http://www.keeptidysweden.org/sa/node.asp?node=2737>

Kekik, L. (2012). The lottery of life. *The Economist, The World in 2013*, 91.

Kellert, S. R. (2005). Nature and childhood development. In S. R. Kellert, *Building for Life* (pp. 63–89). Washington, DC: Island Press.

Kellert, S. R., & Wilson, E.O. (Eds.) (1993). *The biophilia hypothesis*. Washington, DC: Island Press.

Kemmis, S., & Wilkinson, M. (1998). Participatory action research and the study of practice. In B. Atweh, S. Kemmis, & P. Weeks, *Action research in practice: Partnerships for social justice in education* (pp. 21–36). London: Routledge.

Kennedy, R. F. (1968). *Remarks of Robert F. Kennedy at the University of Kansas, March 18, 1968*. Boston: John F. Kennedy Presidential Library and Museum; Retrieved on 17

December 2012 from <http://www.jfklibrary.org/Research/Ready-Reference/RFK-Speeches/Remarks-of-Robert-F-Kennedy-at-the-University-of-Kansas-March-18-1968.aspx>

Kindon, S. L., Pain, R., & Kesby, M. (2007). *Participatory action research approaches and methods: Connecting people, participation and place*. London: Routledge.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behaviour? *Environmental Education Research*, 8(3), 239–260.

Kornfield, J. (2001). *After the ecstasy, the laundry: How the heart grows wise on the spiritual path*. New York: Bantam Books.

Krasny, M. E., & Tidball, K. G. (2009). Applying a resilience systems framework to urban environmental education. *Environmental Education Research*, 15(4), 465–482.

Kretz, L. (2012). Climate change: Bridging the theory-action gap. *Ethics and the Environment*, 17(2), 9–27.

Kübler-Ross, E. (1969/2003). *On death and dying: What the dying have to teach doctors, nurses, clergy, and their own families*. New York: Scribner.

Kuznets, S. (1934). National income, 1929–1932. *Senate document no. 124*, 73d Congress, 2d session.

Kyburz-Graber, R., & Robottom, I. (1999). The OECD-ENSI project and its relevance for teacher training concepts in environmental education. *Environmental Education Research*, 5(3), 273–291.

Lao-tzu (circa 6th century BCE/2006). *Tao te ching* (S. Mitchell, Trans.). New York: HarperCollins Publishers, Inc.

Larkin, P. (1974). Going, Going. In *High Windows* (pp. 21–22). London: Faber and Faber.

- Layard, R. (2006). Happiness and public policy: A challenge to the profession. *Economic Journal*, 116(510), C24–C33.
- Leopold, A. (1949/1969). *A Sand County almanac: And sketches here and there*. New York: Oxford University Press.
- Lincoln, Y. S., & Guba, E. G. (2001). Ethics: The failure of positivist science. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (3rd ed.; pp. 92–107). Thousand Oaks, CA: Sage Publications, Inc.
- Linley, D. (2000). *Design and detail in the home*. New York: Harry N. Abrams, Inc.
- Lofthouse, R. (2012). What is mindfulness? *Oxford Today*, 24(3), 30–34.
- Lotz-Sisitka, H. (2002). Weaving cloths: Research design in contexts of transformation. *Canadian Journal of Environmental Education*, 7(2), 101–124.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Louv, R. (2011). *The nature principle: Human restoration and the end of nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Lovelock, J. (1979). *Gaia: A new look at life on Earth*. Oxford, UK: Oxford University Press.
- Lutz, A., Greischar, L. L., Rawlings, N. B., Ricard, M., & Davidson, R. J. (2004). Long-term meditators self-induce high-amplitude gamma synchrony during mental practice. *Proceedings of the National Academy of Sciences of the United States of America*, 101(46) (2004), 16369–16373.
- Lyle, J. T. (1994). *Regenerative design for sustainable development*. New York: John Wiley & Sons, Inc.
- Malone, K., & Tranter, P. (2003). School grounds as sites for learning: Making the most of environmental opportunities. *Environmental Education Research*, 9(3), 283–303.

Malthus, T. R. (1798/2008). *An essay on the principle of population, or, a view of its past and present effects on human happiness: With an inquiry into our prospects respecting*. Oxford, UK: Oxford University Press.

Marcinkowski, T. J. (1988). *An analysis of correlates and predictors of responsible environmental behavior*. Unpublished doctoral dissertation, Southern Illinois University at Carbondale, IL.

Martin, G. C. (1975). A review of objectives for environmental education. In G. C. Martin & K. S. Wheeler (Eds.), *Insights into Environmental Education* (pp. 20–32). Edinburgh: Oliver & Boyd.

Maslow, A. H. (1971). *The farther reaches of human nature*. New York: The Viking Press.

Max-Neef, M. (1995). Economic growth and quality of life: A threshold hypothesis. *Ecological Economics*, 15, 115–118.

Mayer, M. (2004). What can we do in schools for ESD? Reflections and proposals from the ENSI International Network. In *Quality Environmental Education in Schools for a Sustainable Society: Proceeding of an International Seminar and Workshop on Environmental Education* (pp. 135–151). Cheongju, China: Cheongju National University of Education.

McAndrew, C. (1992). The OECD Environment and School Initiatives (ENSI) project in Scotland. *Annual Review of Environmental Education*, 5, 28–29.

McKeown, R., & Hopkins, C. (2005). EE and ESD: Two paradigms, one crucial goal. *Applied Environmental Education and Communication*, 4(3), 221–224.

McLean, S. (Writer, presenter) (2008). Dangerous world (Broadcast 20 September 2008). In J. Milton (Producer), *The Vinyl Café*. Toronto: CBC Radio [Audio podcast].

Mead, M. (1977). Introduction. In E. Cobb, *The Ecology of Imagination in Childhood*. New York: Columbia University Press.

- Meadows, D. H. (2001). *The global citizen*. Washington, DC: Island Press.
- Meadows, D. H. (2001). Just so much and no more.... *Yes! A journal of positive futures* (Summer 2001), 45.
- Meadows, D. H., Meadows, D. L., & Randers, J. (1992). *Beyond the limits: Confronting global collapse, envisioning a sustainable future*. Post Mills, VT: Chelsea Green Publishing Company.
- Meadows, D. H., Randers, J., & Meadows, D. L. (2004). *Limits to growth: The 30-year update*. White River Junction, VT: Chelsea Green Publishing Company.
- Meadows, D. H., Randers, J., Meadows, D. L., & Behrens, W. W. (1972). *The limits to growth: A report for the Club of Rome's project on the predicament of mankind*. London: Earth Island Limited.
- Merriam, S. B. (Ed.) (2002). *Qualitative research in practice: Examples for discussion and analysis*. San Francisco, CA: Jossey-Bass.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage Publications.
- Ministère de la Culture et de la Communication (n.d.). [Chauvet-Pont-d'Arc]. Retrieved on 17 December 2012 from <http://www.culture.gouv.fr/rhone-alpes/chauvet/francais/lettre3/grotte.htm>
- Mogensen, F., & Mayer, M. (Eds.) (2005). *ECO-schools: Trends and divergences: A comparative study on ECO-school development processes in 13 countries*. Vienna: Austrian Federal Ministry of Education, Science and Culture.
- Monroe, M. C. (2003). Two avenues for encouraging conservation behaviors. *Human Ecology Review*, 10 (2), 113–125.

Nazir, J., Pedretti, E., Wallace, J., Montemurro, D., & Inwood, H. (2011). Reflections on the Canadian experience with education for climate change and sustainable development.

Canadian Journal of Science, Mathematics and Technology Education, 11(4), 365–380.

NCSL (National College for School Leadership) (n.d.). *Leading Sustainable Schools: Getting started - Doorway booklet*. Nottingham: NCSL.

Neumayer, E. (2003). *Weak versus Strong Sustainability: Exploring the limits of two opposing paradigms* (2nd ed.). Cheltenham, UK: Edward Elgar Publishing Limited.

Neumayer, E. (2007). A missed opportunity: The Stern review on climate change fails to tackle the issue of non-substitutable loss of natural capital. *Global Environmental Change*, 17(3/4), 297–301.

NOAA (National Oceanic and Atmospheric Administration) (n.d.). [CO₂ data]. Retrieved on 17 December 2012 from <http://www.esrl.noaa.gov/gmd/ccgg/trends>

Oberlin College and Conservatory (n.d.). [Environmental studies]. Retrieved on 17 December 2012 from <http://new.oberlin.edu/arts-and-sciences/departments/environment/index.dot>

O'Brien, G. (Ed.) (2012). *Bartlett's Familiar Quotations* (18th Ed.). New York: Little, Brown and Company.

Odum, H. T. (1971). *Environment, power and society*. New York: Wiley-Interscience.

OECD (Organisation for Economic Co-Operation and Development) (2011). *OECD economic survey of Sweden 2011*. Paris: Author.

OECD-ENSI (Environment and School Initiatives) (1999). *From the pilot... to the mainstream: Generalisation of good practice in international environmental education: An OECD-ENSI strategy workshop, December 9–12, 1999*. Hadeland, Norway: Workshop Report.

- Ofsted (Office for Standards in Education, children's Services and Skills, UK) (2003). *Taking the first step forward... towards an education for sustainable development: Good practice in primary and secondary schools*. London: Author.
- Ofsted (2007a). *Alphington ESD report, 19 September 2007*. London: Author.
- Ofsted (2007b). *Staunton-on-Wye Primary School ESD report, 15 June 2007*. London: Author.
- Ofsted (2008a). *Alphington ESD report, 4 November 2008*. London: Author.
- Ofsted (2008b). *Glebe School ESD report, 14 May 2008*. London: Author.
- Ofsted (2008c). *Meare Village Primary School ESD report, 1 June 2008*. London: Author.
- Ofsted (2008d). *Schools and sustainability: A climate for change?* London: Author.
- Ofsted (2008e). *Staunton-on-Wye Primary School ESD report, 23 October 2008*. London: Author.
- Ofsted (2009a). *Education for sustainable development: Improving schools – Improving lives*. London: Author.
- Ofsted (2009b). *Staunton-on-Wye Primary School inspection report, 12 May 2009*. London: Author.
- Ontario EcoSchools (2012a). *Ontario EcoSchools: Connections to climate change through rich performance tasks in grade 10 science (applied & academic)* (Rev. ed.). Toronto: York University.
- Ontario EcoSchools (2012b). *Ontario EcoSchools: Mapping climate change impacts and actions in grade 9 geography (applied & academic)* (Rev. ed.). Toronto: York University.
- Ontario Ministry of Education (2008). *The Ontario curriculum: Grades 11 and 12, science*. Toronto: Ontario Ministry of Education.

Oppenheim, A. N. (1992). *Questionnaire design, interviewing and attitude measurement* (New ed.). London: Pinter Publications.

Orr, D. W. (1992). *Ecological literacy: Education and the transition to a postmodern world*. Albany, NY: State University of New York Press.

Orr, D. W. (2001). Foreword. In S. Sterling, *Sustainable education: Re-visioning learning and change* (pp. 7–9). Totnes, UK: Green Books for the Schumacher Society.

Orr, D. W. (2005). Foreword. In M. K. Stone & Z. Barlow (Eds.), *Ecological literacy: Educating our children for a sustainable world* (pp. ix–xi). San Francisco: Sierra Club Books.

Orr, D. W. (2007). Optimism and hope in a hotter time. *Conservation Biology*, 21(6), 1392–1395.

Orr, D. W. (2009). *Down to the wire: Confronting climate collapse*. Oxford: Oxford University Press.

Orr, D. W. (2011). *Hope is an imperative: The essential David Orr*. Washington, DC: Island Press.

Orr, D. W. (n.d.). *A sense of wonder*. Retrieved on 18 December 2012 from <http://www.ecoliteracy.org/essays/sense-wonder>

Osbaldiston, R., & Sheldon, K. M. (2003). Promoting internalized motivation for environmentally responsible behavior: A prospective study of environmental goals. *Journal of Educational Psychology*, 23 (2003), 348–356.

Oulton, C. R., & Scott, W. A. H. (1995). The ‘environmentally educated teacher’: An exploration of the implications of UNESCO-UNEP’s ideas for pre-service teacher education programmes. *Environmental Education Research*, 1(2), 213–231.

Ouzounian, R. 2012. Upstaging the Drama. *Professionally Speaking: The Magazine of the Ontario College of Teachers*, December 2012, 30–32.

Owen, W. (1918/1994). *The war poems of Wilfred Owen* (J. Stallworthy, Ed.). London: Chatto & Windus, Ltd.

Patton, M. Q. (1987). *How to use qualitative methods in evaluation* (2nd ed.). Newbury Park, CA: Sage Publications.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Payne, P., & Wattachow, B. (2009). Phenomenological deconstruction, slow pedagogy, and the corporeal turn in wild environmental/outdoor education. *Canadian Journal of Environmental Education*, 14, 16–32.

Peabody Museum of Natural History, Yale University (n.d.). *G. Evelyn Hutchinson: The “Father” of American Ecology*. Retrieved on 21 December 2012 from <http://peabody.yale.edu/exhibits/curators-choice/g-evelyn-hutchinson-father-american-ecology>

Piaget, J. (1972). *The principles of genetic epistemology* (W. Mays, Trans.). London: Routledge & Kegan Paul Ltd.

Pigou, A. C. (1952/2002). *The economics of welfare* (4th ed. 1952, with a new introduction by N. Aslanbeigui, 2002). London: Transaction Publishers.

Plato (circa 380 BCE /1956). *Great dialogues of Plato* (W. H. D. Rouse, Trans.). New York: New American Library.

Porritt, J., & Winner, D. (1988). *The coming of the greens*. London: Fontana/Collins.

Posch, P. (1991). Environment and school initiatives: Background and basic premises of the project. In OECD, *Environment, schools and active learning, Part 1*. Paris: OECD.

Posch, P. (1993). Research issues in environmental education. *Studies in Science Education*, 21, 21–48.

Posch, P. (1999). The ecologisation of schools and its implications for educational policy. *Cambridge Journal of Education*, 29(3), 341–348.

Postel, S. L., Daily, G. C., & Ehrlich, P. R. (1996). Human appropriation of renewable fresh water. *Science* 271(5250) (February 9 1996), 785–788.

Pyle, R. M. (1993). *The thunder tree: Lessons from an urban wildland*. Guilford, CT: The Lyons Press.

Pylyshyn, Z.W. (2002). Mental imagery: In search of a theory. *Behavioral and Brain Sciences*, 25(2), 157–182.

Reason, P., & Bradbury, H. (Eds.) (2001). *Handbook of action research: Participative inquiry and practice*. London: Sage Publications.

Reid, A. (1996). Exploring values in sustainable development. *Teaching Geography*, 21(4), 168–172.

Rickinson, M. (1999). *The teaching and learning of environmental issues: A classroom-based investigation*. Unpublished doctoral thesis, University of Oxford, UK.

Rickinson, M. (2001). Learners and learning in environmental education: A critical review of the evidence. *Environmental Education Research*, 7(3), 207–320.

Rickinson, M., & Sanders, D. (2005). Secondary school students' participation in school grounds improvement: Emerging findings from a study in England. *Canadian Journal of Environmental Education*, 10(1), 256–272.

Riley, G. A. (1971). Introduction. *Limnology and Oceanography*, 16(2), 177–179.

Robinson, K. (2011). *Out of our minds: Learning to be creative* (2nd ed.). Chichester, UK: Capstone Publishing Ltd.

Robinson, K., with Aronica, L. (2009). *The element: How finding your passion changes everything*. New York: Penguin Group.

Rotter, J. B. (1954). *Social learning and clinical psychology*. Englewood Cliffs, NJ: Prentice-Hall.

- Rousseau, J.-J. (1762/1979). *Émile, ou de l'éducation* (A. Bloom, Trans.). New York: Basic Books.
- Ryle, G. (1968/1971). The thinking of thoughts: What is 'Le Penseur' doing? Reprinted from University of Saskatchewan 'University Lectures', No. 18, 1968. In G. Ryle, *Collected Papers: Volume II, Collected Essays, 1929–1968* (pp. 480–496). London: Hutchinson.
- Sachs, W. (1991). Environment and development: The story of a dangerous liaison. *The Ecologist*, 21(6), 253–257.
- Salzberg, S. (2004). *Lovingkindness: The revolutionary art of happiness*. Boston: Shambhala Publications, Inc.
- Sauvé, L. (2005). Currents in environmental education: Mapping a complex and evolving pedagogical field. *Canadian Journal of Environmental Education*, 10(1), 11–37.
- Sauvé, L., Berryman, T., & Brunelle, R. (2007). Three decades of international guidelines for environment-related education: A critical hermeneutic of the United Nations discourse. *Canadian Journal of Environmental Education*, 12(1), 33–54.
- Scheer, H. (2007). *Energy Autonomy: The economic, social and technological case for renewable energy*. London: Routledge.
- Scheffer, M., Carpenter, S., Foley, J. A., Folke, C., & Walker, B. (2001). Catastrophic shifts in ecosystems. *Nature*, 413(6856), 591–596.
- Schumacher, E.F. (1973/1999). *Small is beautiful: Economics as if people mattered: 25 years later ... with commentaries*. Point Roberts, WA: Hartley & Marks Publishers, Inc.
- Schwandt, T. A. (2001). *Dictionary of qualitative inquiry* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Schwarzwald, A. (1996). Hope. *Rethinking Schools*, 11(1) (Fall 1996), 28.
- Scott, W. A. H. (2001). Editorial. *Environmental Education Research*, 7(3), 205.

Scott, W. A. H. (2002). Editorial: Minds, gaps, models, and behaviours. *Environmental Education Research*, 8(3), 237–238.

Scott, W. A. H. (2009). Environmental education research: 30 years on from Tbilisi. *Environmental Education Research*, 15(2), 155–164.

Scott, W. A. H. (2011). Sustainable schools and the exercising of responsible citizenship – A review essay. *Environmental Education Research*, 17(3), 409–423.

Scott, W. A. H., & Gough, S. (2003). *Sustainable development and learning: Framing the issues*. London: RoutledgeFalmer.

Scott, W. A. H., & Gough, S. (Eds.) (2004). *Key issues in sustainable development and learning: A critical review*. London: RoutledgeFalmer.

SEEd (Sustainability and Environmental Education) [UK] (n.d.). [Sustainable schools]. Retrieved on 17 December 2012 from <http://www.se-ed.co.uk/sustainable-schools>

Selden, T. M., & Song, D. Q. (1994). Environmental quality and development: Is there a Kuznets curve for air-pollution emissions? *Journal of Environmental Economics and Management*, 27, 147–162.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday.

Senge, P., Kleiner, A., Roberts, C., Ross, R. B., & Smith, B. J. (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organization*. London: Nicholas Brealey.

Shayer, M. (1987). Neo-Piagetian theories and educational practice. *International Journal of Psychology*, 22(5–6), 751–772.

Shayer, M., & Ginsburg, D. (2009). Thirty years on – A large anti-Flynn effect? (II): 13–14-year-olds. Piagetian tests of formal operations norms 1976–2006/7. *British Journal of Educational Psychology*, 79, 409–418.

Sia, A. P. (1984). *An investigation of selected predictors of overt responsible environmental behavior (EE Goals)*. Unpublished doctoral dissertation, Southern Illinois University at Carbondale, IL.

Sia, A. P., Hungerford, H. R., & Tomera, A. N. (1986). Selected predictors of responsible environmental behavior: An analysis. *The Journal of Environmental Education*, 17(2), 31–40.

Simonetti, S. J. (2007). *Children's environmental values: Comparison of a Toronto District School Board Ecoschool and non-Ecoschool*. Unpublished master's thesis, Royal Roads University, Victoria, British Columbia, Canada.

Smith, A. (1776/1930). *An inquiry into the nature and causes of the wealth of nations* (5th ed.; Vol. 2). London: Methuen.

Smith, L. (2001). Jean Piaget, 1896–1980. In J. Palmer (Ed.), *Fifty modern thinkers on education: From Piaget to the present* (pp. 37–44). Abingdon, UK: Routledge.

Smith, S. (2004). *The role of Environment and School Initiatives (ENSI) in a global environment: A summary of its operations, effectiveness, relevance and performance since its inception in 1986*. International: Environment and School Initiatives (ENSI).

Smith-Sebasto, N. J., & D'Costa, A. (1995). Designing a Likert-type scale to predict environmentally responsible behavior in undergraduate students: A multistep process. *The Journal of Environmental Education*, 27(1), 14–20.

Smith-Sebasto, N. J., & Fortner, R. W. (1994). The environmental action internal control index. *The Journal of Environmental Education*, 25(4), 23–29.

Smith-Sebasto, N. J., & Walker, L. M. (2005). Toward a grounded theory for residential environmental education: A case study of the New Jersey School of Conservation. *The Journal of Environmental Education*, 37(1), 27–42.

Sobel, D. (1993). *Children's special places: Exploring the role of forts, dens, and bush houses in middle childhood*. Tucson, AZ: Zephyr Press.

Sobel, D. (2004). *Place-based education: Connecting classrooms and communities*. Great Barrington, MA: The Orion Society.

Soetaert, R., & Mottart, A. (2004). The contact zone. Whose nature? Whose sustainability? In W. Scott & S. Gough (Eds.), *Key Issues in Sustainable Development and Learning: A Critical Review* (pp. 52–56). London: RoutledgeFalmer.

Speth, J. G. (2012). American passage: Towards a new economy and a new politics. *Ecological Economics*, 84, 181–186.

Srugoninis, L. (Trans., Ed.) (2002). *The Earth remains: An anthology of contemporary Lithuanian prose*. Vilnius: Tyto Alba.

Stables, A.W.G. (1996). Paradox in compound educational slogans: Evaluating equal opportunities in subject choice. *British Journal of Educational Studies*, 44(2), 159–167.

Stables, A.W.G. (2001a). Who drew the sky? Conflicting assumptions in environmental education. *Educational Philosophy and Theory*, 33(2), 250–254.

Stables, A.W.G. (2001b). Language and meaning in environmental education: An overview. *Environmental Education Research*, 7(2), 121–128.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage Publications.

Stake, R. E. (2008). Qualitative case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry* (3rd ed.; pp. 119–149). Thousand Oaks, CA: Sage Publications, Inc.

Stanford Encyclopedia of Philosophy (n.d.). *Plato on knowledge in the Theaetetus*. Retrieved on 17 December 2012 from <http://plato.stanford.edu/entries/plato-theaetetus/>

Stapp, W. B. (1970). A strategy for curriculum development and implementation in environmental education at the elementary and secondary levels. In J. Evans & S. Boyden (Eds.), *Education and the Environmental Crisis* (pp. 23–37). Canberra: Australian Academy of Science.

Stapp, W. B., Bennett, D., Bryan, W. Jr., Fulton, J., MacGregor, J., Nowak, P., et al. (1997). *The concept of environmental education and epilogue*. Retrieved on 13 December 2012 from http://www.hiddencorner.us/html/PDFs/The_Concept_of_EE.pdf

Stapp, W. B., Havlick, S., Bennett, D., Bryan, W., Jr., Fulton, J., MacGregor, J., et al. (1969). The concept of environmental education. *The Journal of Environmental Education*, 1(1), 30–31. Republished in 1997 with an epilogue in *ERIC/SMEAC Information Bulletin*.

Stapp, W. B., Wals, A. E. J., & Stankorb, S. (1996). *Environmental education for empowerment: Action research and community problem solving*. Dubuque, IW: Kendall Hunt Publishing Company.

Statistics Canada (n.d.). [Population of City of Toronto]. Retrieved on 24 January 2013 from <http://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-csd-eng.cfm?Lang=Eng&TAB=1&GK=PR&GC=3520005>

Staunton Primary School (n.d.). [Eco-School and Forest School projects]. Retrieved on 17 December 2012 from http://www.stauntonprimaryschool.ik.org/p_Eco-schools.ikml

Sterling, S. (2001). *Sustainable education: Re-visioning learning and change*. Totnes, UK: Green Books for the Schumacher Society.

Sterling, S. (2002). Linking thinking, education and learning: An introduction. In S. Sterling, P. Maiteny, D. Irving, & J. Salter, *Introduction: Linking thinking: New perspectives on thinking and learning for sustainability* (Unit 1). Aberfeldy, Scotland: WWF Scotland.

Sterling, S. (2003). *Whole systems thinking as a basis for paradigm change in education: Explorations in the context of sustainability*. Unpublished doctoral thesis, University of Bath, UK.

Sterling, S. (2010). Learning for resilience, or the resilient learner? Towards a necessary reconciliation in a paradigm of sustainable education. *Environmental Education Research*, 16(5–6), 511–528.

Stern, D. I. (2003). *The environmental Kuznets curve*. Published by the International Society for Ecological Economics, *Internet Encyclopedia of Ecological Economics*.

Stern, D. I., Common, M. S., & Barbier, E. B. (1996). Economic growth and environmental degradation: The environmental Kuznets curve and sustainable development. *World Development*, 24(7), 1151–1160.

Stern, N. (2006). *The economics of climate change: The Stern review*. Retrieved on 14 December 2012 from http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/sternreview_index.htm

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407–424.

Stevenson, R. B. (1987/2007). Schooling and environmental education: Contradictions in purpose and practice. Reprinted in *Environmental Education Research*, 13(2), 139–153.

Stevenson, R. B. (1993). Viewpoint. Becoming compatible: Curriculum and environmental thought. *The Journal of Environmental Education*, 24(2), 4–9.

Stevenson, R. B. (1997). Developing habits of environmental thoughtfulness through the in-depth study of select environmental issues. *Canadian Journal of Environmental Education*, 2(1), 183–201.

Stiglitz, J., Sen, A., & Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Paris: Commission on the Measurement of Economic Performance and Social Progress.

Stone, M. K., & Barlow, Z. (Eds.) (2005). *Ecological literacy: Educating our children for a sustainable world*. San Francisco: Sierra Club Books.

Stone, M. K., & Center for Ecoliteracy (2009). *Smart by nature: Schooling for sustainability*. Healdsburg, CA: Watershed Media.

Strange, T., & Bayley, A. (2008). *OECD insights: Sustainable development: Linking economy, society, environment*. Paris: OECD.

Sullivan, L. H. (1896). The tall office building artistically considered. *Lippincott's Monthly Magazine*, 57 (March 1896), 403–309.

Summers, M., Childs, A., & Corney, G. (2005). Education for sustainable development in initial teacher training: Issues for interdisciplinary collaboration. *Environmental Education Research*, 11(5), 623–647.

Sustainable Development Commission [UK] (2007/2010). *Every child's future matters* (Rev. 3rd ed.). Retrieved on 14 December 2012 from <http://www.sd-commission.org.uk/publications.php?id=578>

Sustainable Development Education Panel [UK] (1998). *Learning for sustainability in the schools sector*. London: Department for the Environment, Transport and the Regions (DETR).

Sustainable Development Education Panel [UK] (2001). *Education for sustainable development – More relevant than ever: The third annual report*. London: Department of the Environment, Transport and the Regions (DETR).

Suzuki, D. (Ed.) (2002). *When the wild comes leaping up: Personal encounters with nature*. Vancouver: Greystone Books.

Suzuki, D. (2010). *The legacy: An elder's vision for our sustainable future*. Vancouver: Greystone Books.

Suzuki, S. (1970/2010). *Zen mind, beginner's mind: 40th anniversary edition with a new afterword*. Boston: Shambhala Publications, Inc.

Swan, J. A., & Stapp, W. B. (Eds.) (1974). *Environmental education: Strategies toward a more livable future*. New York: Sage Publications.

Talberth, J. (2008). A new bottom line for progress. In The Worldwatch Institute, *State of the world 2008: Innovations for a sustainable economy* (pp. 18–31). London: W.W. Norton Limited.

Tan, M., & Pedretti, E. (2010). Negotiating the complexities of environmental education: A study of Ontario teachers. *Canadian Journal of Science, Mathematics and Technology Education*, 10(1), 61–78.

TDSB (Toronto District School Board) (2004). *TDSB EcoSchools ecoliteracy guide: Climate change in grade 10 science (applied)*. Toronto: York University.

TDSB (2005). *TDSB EcoSchools ecoliteracy guide: Climate change in grade 9 geography (academic)* (Rev. ed.). Toronto: York University.

TDSB (2007). *GRASP: A tool for developing ecological literacy through rich performance tasks*. Toronto: Author.

TDSB (2012). *Certification toolkit 2012/13: EcoSchools.ca*. Toronto: Author.

TDSB (n.d. a). *Best practices: EcoSchools.ca*. Retrieved on 5 February 2013 from http://www.tdsb.on.ca/_site/ViewItem.asp?siteid=207&menuid=40664&pageid=34049

TDSB (n.d. b). [TDSB certified EcoSchools]. Retrieved on 5 February 2013 from http://www.tdsb.on.ca/_site/ViewItem.asp?siteid=207&menuid=23878&pageid=20686

TDSB (n.d. c). [TDSB secondary schools]. Retrieved on 5 February 2013 from http://www.tdsb.on.ca/schools/tdsb_school_search/SearchBySchool.asp?show=AllSecondary

The Oberlin Project (n.d.). [David W. Orr]. Retrieved on 17 December 2012 from <http://www.oberlinproject.org/about/executive-director/david-w-orr>

The Willow School (n.d. a). [FAQ]. Retrieved on 17 December 2012 from <http://www.willowschool.org/about-us/faq>

The Willow School (n.d. b). [Mission]. Retrieved on 17 December 2012 from <http://www.willowschool.org/about-us/mission-philosophy>

The Willow School (n.d. c). [Virtues]. Retrieved on 17 December 2012 from <http://www.willowschool.org/about-us/virtues>

Thomas, D. (1946). Fern Hill. In *Deaths and Entrances* (pp. 65–66). London: Dent.

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 for the Environment and Heritage and Australian Research Institute in Education for Sustainability (ARIES).

Tilbury, D., Coleman, V., Jones, A. , & MacMaster, K. (2005). *A national review of environmental education and its contribution to sustainability in Australia: Community education*. Canberra: Australian Government Department for the Environment and Heritage and Australian Research Institute in Education for Sustainability (ARIES).

Tilbury, D., & Cooke, K. (2005). *A national review of environmental education and its contribution to sustainability in Australia: Frameworks for sustainability – Key findings*. Canberra: Australian Government Department for the Environment and Heritage and Australian Research Institute in Education for Sustainability (ARIES).

Tuan, Y.-F. (1974). *Topophilia: A study of environmental perception, attitudes, and values*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

U.S. House of Representatives (2008). *H.R. 3036 (110th): No Child Left Inside Act of 2008*. Retrieved on 17 December 2012 from <http://www.govtrack.us/congress/bills/110/hr3036>

Uitto, A., Juuti, K., Lavonen, J., Byman, R., & Meisalo, V. (2011). Secondary school students' interests, attitudes and values concerning school science related to environmental issues in Finland. *Environmental Education Research*, 17(2), 167–186.

UN (n.d.) *World Urbanization Prospects: The 2007 Revision: Executive Summary*. Retrieved on 26 January 2013 from http://www.un.org/esa/population/publications/wup2007/2007WUP_ExecSum_web.pdf

UN General Assembly (1972). *Resolution 2994 (A/RES/2994(XXVII))* [Designating World Environment Day]. 15 December 1972, p. 42. Retrieved on 14 December 2012 from http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/2994%28XXVII%29&Lang=E&Area=RESOLUTION

UN General Assembly (1992). *Annex I to the report of the United Nations Conference on Environment and Development (A/CONF.151/26 (Vol. I)). Rio de Janeiro, 3–14 June 1992*. Retrieved on 14 December 2012 from <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>

UNCED (United Nations Conference on Environment and Development) (1992). *Agenda 21: Programme of action for sustainable development; Rio Declaration on environment and development; Statement of forest principles*. New York: United Nations Department of Public Information.

UNCSD (United Nations Conference on Sustainable Development) (2012). [SD-learning]. Retrieved on 15 December 2012 from http://www.uncsd2012.org/rio20/meetings_sdlearning.html

UNDP (United Nations Development Programme) (2010). *Human development report 2010, 20th anniversary edition: The real wealth of nations: Pathways to human development*. New York: Palgrave Macmillan.

UNDP (n.d.). [About human development]. Retrieved on 17 December 2012 from <http://hdr.undp.org/en/humandev>

UNEP (United Nations Environment Programme) (n.d.). [World Environment Day]. Retrieved on 18 December 2012 from <http://www.unep.org/wed>

UNESCO (United Nations Educational, Scientific and Cultural Organization) (1946). *Constitution of UNESCO*. Retrieved on 18 December 2012 from <http://www.unesco.org/new/en/unesco/about-us/who-we-are/history/constitution/>

UNESCO (1997). *Educating for a sustainable future: A transdisciplinary vision for concerted action*. Paris: Author.

UNESCO (1994). *Agenda 21: Rescue Mission: Planet Earth*. Paris: Author.

UNESCO (n.d.). *Prehistoric sites and decorated caves of the Vézère valley*. Retrieved on 17 December 2012 from <http://whc.unesco.org/en/list/85>

UNESCO/UNEP (1975). *The Belgrade Charter: A global framework for environmental education*. Paris: UNESCO/Nairobi: UNEP.

UNESCO/UNEP (1978). *Final report: Intergovernmental conference on environmental education, Tbilisi (USSR), 14–26 October 1977*. Paris: UNESCO/Nairobi: UNEP.

UNESCO/UNEP (2007). *The Ahmedabad Declaration 2007: A call to action – Education for life: Life through education*. Paris: UNESCO/Nairobi: UNEP.

UNFCCC (United Nations Framework Convention on Climate Change) (1992). *United Nations Framework Convention on Climate Change*. Bonn, Germany: Author.

UNFCCC (1998). *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. Bonn, Germany: Author.

UNFCCC (n.d. a). [Kyoto Protocol]. Retrieved on 17 December 2012 from http://unfccc.int/kyoto_protocol/items/2830.php

UNFCCC (n.d. b). *Status of ratification of the Convention*. Retrieved on 17 December 2012 from

http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php

Vare, P., & Scott, W. A. H. (2007). Learning for a change: Exploring the relationship between education and sustainable development. *Journal of Education for Sustainable Development*, 1(2), 191–198.

Vare, P., & Scott, W. A. H. (2008). *Education for sustainable development: Two sides and an edge*. Discussion Paper. London: Development for Education Association (DEA).

Venn, J. (1880). On the diagrammatic and mechanical representation of propositions and reasonings. *Philosophical Magazine and Journal of Science, Series 5*, 10(59), 1–18.

Victor, P. A. (2005). [Book review: Eric Neumayer, *Weak versus strong sustainability* (2003; 2nd ed.)]. *Ecological Economics*, 52, 127–128.

Victor, P. A. (2008). *Managing without growth: Slower by design, not disaster*. Cheltenham, UK: Edward Elgar Publishing Limited.

Victor, P. A., & Rosenbluth, G. (2007). Managing without growth. *Ecological Economics*, 61(2–3), 492–504.

Wackernagel, M., Schulz, N. B., Deumling, D., Callejas Linares, A., Jenkins, M., Kapos, V., et al. (2002). Tracking the ecological overshoot of the human economy. *Proceedings of the National Academy of Sciences*, July 9, 2002, 99(14), 9266–9271.

Wall Street Journal (2004). *Scans of monk's brains show meditation alters structure, functioning*. Retrieved on 17 December 2012 from

http://psyphz.psych.wisc.edu/web/News/Meditation_Alters_Brain_WSJ_11-04.htm

WCED (World Commission on Environment and Development) (1987). *Our common future* [the Brundtland report]. Oxford: Oxford University Press.

Webster, K., & Johnson, C. (2010). *Sense and sustainability: Educating for a low carbon world* (Rev. 2nd ed.). UK: Terra Preta in association with the Ellen MacArthur Foundation and InterfaceFLOR.

Whitehead, A. N. (1929/1967). *The aims of education and other essays*. New York: The Free Press.

Whitehead, A. N. (1929/1979). *Process and reality* (2nd ed.). New York: Simon & Schuster.

Wilson, E. O. (1984). *Biophilia*. Cambridge, MA: Harvard University Press.

Wordsworth, W. (1807). Composed Upon Westminster Bridge, September 3, 1802. In *Poems, in two volumes* (Vol. 1, p. 118). London: Longman, Hurst, Rees, and Orme, publisher.

WorldAtlas.com (n.d.). [Mercator world outline map]. Retrieved on 18 December 2012 from <http://www.worldatlas.com/aatlas/wrldnanb.htm>

WWF (World Wildlife Fund) (n.d. a). *Building the jigsaw: Staunton-on-Wye Endowed Primary School, Hereford*. Godalming, UK: Author.

WWF (n.d. b). *Everyone listened to, heard and respected: Meare Village Primary School, Somerset*. Godalming, UK: Author.

WWF (n.d. c). *Pupils take control of their learning: Glebe School, Kent*. Godalming, UK: Author.

WWF (n.d. d). *School stories*. Retrieved on 17 December 2012 from http://www.wwf.org.uk/what_we_do/working_with_schools/resources/school_stories

WWF (n.d. e). *Taking the yellow brick road together: Alphington Primary School, Exeter*. Godalming, UK: Author.

WWF (n.d. f). *WWF founder Max Nicholson dies*. Retrieved on 17 December 2012 from http://www.wwf.org.uk/wwf_articles.cfm?unewsid=1533

Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Zelezny, L. C. (1999). Educational interventions that improve environmental behaviors: A meta-analysis. *The Journal of Environmental Education*, 31(1), 5–14.

Appendices

Appendix A: Schedule of Interviews

Organization or school	People		Interview date (2006)	Format
Canada				
TDSB; former EcoSchools coordinator	CA-Coord		Sat. 29 April	individual
CA-1	CA-Admin1 CA-Teach1	CA-Teach2	Fri. 28 April (interview recorded); Thurs. 8 June (visit not recorded)	group
CA-2	CA-Teach3	CA-Teach4	Thurs. 18 May (interview recorded); Fri. 9 June (visit not recorded)	group
CA-3	CA-Teach5	CA-Teach6	Wed. 24 May (interview recorded); Thurs. 8 June (visit not recorded)	group
CA-4	CA-Teach7	CA-Admin2	Thurs. 31 May (interview recorded); Wed. 7 June (visit not recorded)	mixed format
Lithuania ^a				
Lithuanian Green Movement	LT-Coord		Thurs. 2 March; Thurs. 9 March	individual
LT-1	LT-Admin1 LT-Teach1	LT-Teach2 LT-Care	Fri. 3 March; Mon. 6 March	mixed format
LT-2	LT-Admin2 LT-Teach3	LT-Teach4	Wed. 8 March; Thurs. 9 March	mixed format
LT-3	LT-Admin3 LT-Admin4	LT-Teach5	Tues. 14 March	mixed format
LT-4	LT-Admin5 LT-Teach6	LT-Teach7	Wed. 15 March; Thurs. 16 March	individual
Sweden ^a				
Keep Sweden Tidy	SV-Coord		Mon. 20 March	individual
SV-1	SV-Admin1 SV-Teach1	SV-Care	Tues. 21 March	group
SV-2	SV-Admin2	SV-Teach2	Thurs. 23 March	group

Note. Coord = the national coordinator; Admin = an administrator at the school (CA: principal; LT: director; SV: rektor); Teach = a teacher; Care = a caretaker

^a All visits in Lithuania and Sweden included recorded interviews.

Appendix B: Information Letter for Administrators

Dear School Administrator,

I would like to invite you to participate in a research study that is part of my doctoral program in education and environmental studies at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT). The study explores adult leaders' means of sustaining a commitment to sustainability in EcoSchools-certified secondary schools in Canada, Lithuania and Sweden. For this project, I would like to interview members of your EcoSchools Committee such as yourself, your head caretaker, a lead teacher, or other staff you might consider relevant.

What issues does this study address?

The goal of this study is to explore the methods and motivations of adult leaders in EcoSchools in attaining and going beyond certification.

What do I expect from the participants?

Participants will be asked to complete a background questionnaire (about 20 minutes) about their own education and involvement in education for sustainability. I will conduct interviews (about one hour at a time convenient for you, with questions shared ahead) with each participant which will be recorded and transcribed and highlights shared for feedback. In addition, I would like to make a visit to your school that would take place over two or three days in order to observe your sustainability practices and gain access to relevant EcoSchools documents.

All information that is gathered in this study will be kept confidential. Collected data will be stored in a secure area in my home to which only my graduate supervisor and I will have access. The data will be stored for three years past the completion of the study and then all materials will be destroyed. To the best of my ability, anonymity will be assured through the use of pseudonyms for the participant names and schools in any publications or public presentations about the research. However, due to the small sample size and the profile of unique roles such as your own, some identities may not remain anonymous to those with an insider's understanding of the program. Participation in the study is voluntary and you may choose not to answer particular questions or withdraw from the study at any time. You are asked to sign the consent form on the next page prior to participating in the study.

Thank you for considering this request. The study would benefit from your participation. If you have any questions, please contact either myself or my supervisor; we will be happy to further discuss the details of the project. I look forward to hearing from you.

Best regards,

Kate Moss

PhD Candidate

Collaborative program in education and environmental studies

Researcher: Kate Moss
(416) [redacted]
[redacted] @ [redacted]

Supervisor: Dr. Dennis Thiessen
(416) [redacted] ext. [redacted]
[redacted] @ [redacted]

Appendix C: Information Letter for Colleagues

Dear Colleague,

I would like to invite you to participate in a research study that is part of my doctoral program in education and environmental studies at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT). The study explores adult leaders' means of sustaining a commitment to sustainability in EcoSchools certified secondary schools in Canada, Lithuania and Sweden. For this project, I would like to interview you as staff associated with the EcoSchools Program.

What issues does this study address?

The goal of this study is to explore the methods and motivations of adult leaders in EcoSchools in attaining and going beyond certification.

What do I expect from the participants?

Your involvement would include completing a background questionnaire (about 20 minutes) about your own education and involvement in education for sustainability and an interview (about one hour) which will be recorded, transcribed and highlights shared with you for feedback. To guide the interviews, I will provide you with questions to think about prior to our meeting, which will be done in person and scheduled at a time that is convenient for you.

Your participation in my study is voluntary. You may choose not to answer particular questions and you may withdraw from the study at any time. All information that is gathered in this study will be kept confidential. Collected data will be stored in a secure area in my home to which only my graduate supervisor and I will have access. The data will be stored for three years past the completion of the study and then all materials will be destroyed. To the best of my ability, anonymity will be assured through the use of pseudonyms for the participant names and schools in any publications or public presentations about the research. However, due to the small sample size and the profile of unique roles such as your own, some identities may not remain anonymous to those with an insider's understanding of the program. You are asked to sign the consent form on the next page prior to participating in the study.

Thank you for considering this request. The study would benefit from your participation. If you have any questions, please contact either myself or my supervisor; we will be happy to further discuss the details of the project. I look forward to hearing from you.

Best regards,

Kate Moss

PhD Candidate

Collaborative program in education and environmental studies

Researcher: Kate Moss
(416) [redacted]
[redacted] @ [redacted]

Supervisor: Dr. Dennis Thiessen
(416) [redacted] ext. [redacted]
[redacted] @ [redacted]

Appendix D: Consent Form for Participants

As a **participant**, I agree to voluntarily participate in this research under the following conditions:

- I have read and I understand the content of the information letter regarding the study by Kate Moss.
- I will engage in a maximum of two one-hour interviews about my role in the EcoSchools program as well as completing a background questionnaire.
- I will allow the interview to be recorded and transcribed.
- I may participate in a school site tour, providing background on observed facilities
- I understand that every effort will be made to ensure the information will remain confidential and anonymous.
- I understand that I may withdraw from the study at any time.

Participant's Signature

Name of School

Date

As a **researcher**, I agree to conduct the study ethically and as follows:

- I will provide you with a copy of major questions prior to the interview.
- I will schedule the interview at a time convenient to you.
- I will provide you with highlights from the interview transcript and a final summary of our work for your comments and feedback.

Signature of Researcher

Date

Please retain a copy of this letter and consent form for your records.

Appendix E: Background Questionnaire for Participants

COMPARATIVE INTERNATIONAL EDUCATION FOR SUSTAINABILITY: CANADA, LITHUANIA AND SWEDEN

Your time in filling out this questionnaire is very much appreciated. The information you provide is voluntary and will be kept confidential, to be used only in the context of this research. When you are finished, please email your responses to me at the address shown below.

With many thanks, Kate Moss.

Email:

██████████ @ ██████████

1. Indicate your country: Canada Lithuania Sweden
2. School name:
3. Indicate your age group: 20s 30s 40s 50s 60s
4. Indicate your gender: male female
5. Please state your own educational background and major subject areas:
6. If you are an **Administrator** or **EcoSchools Coordinator**, state the number of years in this role (what type of school; what role):
7. If you are a **Head Caretaker**, state the number of years and in what type of school you have had this role:
8. If you are or have been a **Teacher**, state the number of years, subjects and ages of students you have taught:
9. Please list any school sustainability projects you have been involved in:
10. Please list any professional development that you have organized regarding sustainability issues:
11. Please list any professional development that you have received regarding sustainability issues:
12. Please list any future education or professional development that you are planning on regarding sustainability issues:

Appendix F: Original English Interview Schedule

COMPARATIVE INTERNATIONAL EDUCATION FOR SUSTAINABILITY: CANADA, LITHUANIA AND SWEDEN

Thank you for agreeing to take part in this research by reading the information letter and signing the consent form. The interview will not exceed one hour and will be recorded. All information will be kept confidential, accessed only by myself or my supervisor during the study. The following questions will be used to guide the interview.

Interview Questions:

1. What does 'education for sustainability' mean to you?
2. What was it that first brought you to issues of sustainability?
3. If the line below represents your career from its start to the present time, what are a few of the significant experiences related to sustainability that you have had along the way and approximately where on the line would they be represented?

Career start

Present time

4. Who plays key roles in a green school and for what reasons?
5. How is your role unique in supporting education for sustainability in your school and your home?
6. How do you maintain your motivation in sustainability curriculum and projects?
7. How do you initiate and maintain staff and student engagement in sustainability curriculum and projects?
8. What are the most important aspects of sustainable development that you emphasize in your EcoSchools program?
9. In what ways is sustainable development infused through the formal education documents, curriculum delivery, assessment and the school as a system embedded in the community?
10. If you were to give advice to another teacher or school considering the EcoSchools program, what would you say the top five key success factors are?
11. What are the three biggest challenges related to being an EcoSchool?
12. Is there anything else you would like to tell me?

Appendix G: Original Lithuanian Interview Schedule

POKALBIO SU DALYVIAIS PLANAS ŠVIETIMO DARNIAM VYSTYMUISI Palyginimas tarptautiniu mastu: KANADA, LIETUVA IR ŠVEDIJA

Dėkoju, kad perskaitėte informacinį laišką ir pasirašėte sutikimo dalyvauti šiame projekte formą. Pokalbis užtruks ne ilgiau kaip vieną valandą ir bus įrašinėjamas. Gauta informacija bus panaudota mano tiriamajame darbe ir prieinama tik man ir mano moksliniam vadovui. Pokalbio metu bus užduodami šie klausimai:

Pokalbio klausimai:

1. Kaip Jūs suprantate sąvoką “švietimas darniam vystymuisi”?
2. Kokiomis aplinkybėmis Jūs pirmą kartą susidūrėte su šia sąvoka?
3. Žemiau pateiktoje profesinės karjeros skalėje atitinkamoje vietoje laiko atžvilgiu pažymėkite keletą reikšmingų Jūsų profesinės veiklos įvykių, susijusių su švietimu darniam vystymuisi.

Karjeros pradžia

Dabartinė
situacija

4. Kas ir dėl kokių priežasčių vaidina pagrindinį vaidmenį įgyvendinant “žalios mokyklos” idėją?
5. Kaip Jūs palaikote švietimo darniam vystymuisi idėją savo mokykloje ir gyvenamojoje vietoje?
6. Kas palaiko Jūsų motyvaciją įgyvendinant švietimo darniam vystymuisi programas ir projektus?
7. Kaip Jūs įtraukiate kitus personalo narius ir mokinius bei palaikote jų dalyvavimą švietimo darniam vystymuisi programose ir projektuose?
8. Kokius pagrindinius švietimo darniam vystymuisi aspektus Jūs akcentuojate savo EKO mokyklos programoje?
9. Kaip švietimo darniam vystymuisi idėjos atsispindi formaliuose švietimo dokumentuose, ugdymo programų įgyvendinime, vertinimo procese ir mokyklos, kaip bendruomenės dalies, sistemoje?
10. Kokius penkis svarbiausius sėkmės kriterijus Jūs išskirtumėte, jeigu reikėtų patarti kolegai ar mokyklos, ketinančios įgyvendinti EKO mokyklos programą, bendruomenei?
11. Kokie yra trys pagrindiniai iššūkiai (problemos), su kuriais susiduria EKO mokykla?
12. Kiti Jūsų komentarai.

Appendix H: Alternate Interview Schedule for Canada and Sweden

Original Questions:

- 1 What does ‘education for sustainability’ mean to you? (Q1)
2. What was it that first brought you to issues of sustainability? (Q2)

Alternate Questions:

Read excerpt from ‘After All is Said and Done, the Earth Remains’, the editorial essay of *The Earth Remains*, translated and edited by Laima Srugonis (2002), and ask for comments:

... how is it that ... we have not created utopia? Perhaps because utopia is a transitory dream – an attractive idea. What remains when the dream of utopia fades is the earth; that fact is constituted by almost every writer represented in this anthology. Traditionally ... [people] have historically felt rooted to the earth. Despite [external] ... influence(s), the writers in this anthology ... express a bond with the earth. Their characters may on occasion lie flat on the earth, beat the earth with their fists, shudder from the cold of a dirt floor, dig in it, kick it, but ultimately, are all a part of it. (Q3)

AQ1. How would you describe your connection with nature?

AQ 2a) What is your vision of the future ‘progress’ of society as a whole?

AQ 2b) By what means might society progress in the 21st century, while ensuring generations to come inherit a living Earth? (Q4)

AQ 2c) In what particular ways can education contribute to a liveable future?

AQ 2d) How would you characterize the role of motivation (understanding the seriousness of a problem) versus hopefulness (feeling able to do something about it) in developing a liveable future? (Q5)

AQ 3i) What questions do you think I should be asking to understand the EcoSchools project here?

AQ 3a) How would you characterize the goals of the EcoSchools program? (Q6)

AQ 3b) What efforts did it require on your behalf for your school to be awarded the EcoSchools Green Flag?

AQ 3c) Part A) Describe some of your biggest successes. (Q7)

AQ 3c) Part B) Describe some of your biggest challenges, and how you surmounted them. (Q8)

AQ 3d) Describe the various essential people and the mechanisms by which they have contributed to the EcoSchools program.

AQ 4a) What are your own (and the school’s) goals for your school in going beyond certification? (Q9)

AQ 4b) How far do you think you have come?

AQ 4c) Which of the goals that you have met/plan to meet do you think would be part of your school program even without the EcoSchools program? (Q10, adapted)

AQ 4d) Which of your goals has arisen because of the EcoSchools program? (Q10, adapted)

AQ 5. Is there anything else you would like to tell me?

Note. Numbering in **green** represents questions (e.g. Q9) in final “top” ten numbering.

Appendix I: Alternate Interview Schedule for Lithuania

Original Questions:

1. What does 'education for sustainability' mean to you? (Q1)
2. What was it that first brought you to issues of sustainability? (Q2)

Alternate Questions:

Read excerpt from 'After All is Said and Done, the Earth Remains', the editorial essay of *The Earth Remains: An Anthology of Contemporary Lithuanian Prose*, translated and edited by Laima Sruoginis (2002), and ask for comments:

...how is it that now that the Soviet Army has gone we have not created utopia? Perhaps because utopia is a transitory dream – an attractive idea. What remains when the dream of utopia fades is the earth; that fact is constituted by almost every writer represented in this anthology. Traditionally an agricultural nation with deep rituals associated with the cycle of the passing seasons, Lithuanians have historically felt rooted to the earth. Despite the influence of Western literary trends, foreign words and concepts, despite the psychological scars left behind by a dehumanizing totalitarian regime, the writers in this anthology, whether living abroad or in Lithuania, express a bond with the earth. Their characters may on occasion lie flat on the earth, beat the earth with their fists, shudder from the cold of a dirt floor, dig in it, kick it, but ultimately, are all a part of it. (Q3)

AQ 1. How would you describe your connection with nature?

AQ 2a) What is your vision of the future 'progress' of society as a whole?

AQ 2b) By what means might society progress in the 21st century, while ensuring generations to come inherit a living Earth? (Q4)

AQ 2c) In what particular ways can education contribute to a liveable future?

AQ 2d) How would you characterize the role of motivation (understanding the seriousness of a problem) versus hopefulness (feeling able to do something about it) in developing a liveable future? (Q5)

AQ 3i) What questions do you think I should be asking to understand the EcoSchools project here?

AQ 3a) How would you characterize the goals of the EcoSchools program? (Q6)

AQ 3b) What efforts did it require on your behalf for your school to be awarded the EcoSchools Green Flag?

AQ 3c) Part A) Describe some of your biggest successes. (Q7)

AQ 3c) Part B) Describe some of your biggest challenges, and how you surmounted them. (Q8)

AQ 3d) Describe the various essential people and the mechanisms by which they have contributed to the EcoSchools program.

AQ 4a) What are your own (and the school's) goals for your school in going beyond certification? (Q9)

AQ 4b) How far do you think you have come?

AQ 4c) Which of the goals that you have met/plan to meet do you think would be part of your school program even without the EcoSchools program? (Q10, adapted)

AQ 4d) Which of your goals has arisen because of the EcoSchools program? (Q10, adapted)

AQ 5. Is there anything else you would like to tell me?

Note. Numbering in **green** represents questions (e.g. Q9) in final "top" ten numbering.

Appendix J: Copy of Note of Gratitude for Lithuanian Participants

8 August, 2006

[Name of participant]
[School]
[Date(s) of participation 2006]

This certificate is to acknowledge your kind participation in research with one of my doctoral students, Kate Moss. She travelled to Lithuania during March 2006 as part of her dissertation project in order to interview adults involved in certified secondary school EcoSchools. The topic of her thesis is “Comparative International Education for Sustainability: Canada, Lithuania, and Sweden.” Your contributions were invaluable to the strength of her work, and very much appreciated.

Yours sincerely,

Dr. Dennis Thiessen
Supervisor
OISE/UT
252 Bloor Street W
Toronto, Ontario
M5S 1V6

Kate Moss
PhD Candidate
OISE/UT
252 Bloor Street W
Toronto, Ontario
M5S 1V6

Appendix K: Interview Questions Covered on Site in Each Nation

Table K1 *Interview Questions Covered in Canada*

Question	CA-Coord	CA-1	CA-2	CA-3	CA-4
1/ Q1	•	•	•	•	•
2/ Q2	•	•	•	•	•
Book/ Q3	•	•	•	•	•
AQ1	•	not	not	not	not
AQ2a	not	not	not	not	not
AQ2b/ Q4	•	•	•	•	•
AQ2c	•	not	•	not	not
AQ2d/ Q5	•	•	not	•	•
AQ3i	•	not	•	•	not
AQ3a/ Q6	•	•	✓	•	•
AQ3b	•	not	not	not	•
AQ3c Part A/ Q7	•	•	•	•	•
AQ3c Part B/ Q8	•	•	•	•	•
AQ3d	•	✓	✓	not	✓
AQ4a/ Q9	•	•	•	•	not
AQ4b	•	•	not	not	•
AQ4c/ Q10	•	•	•	•	•
AQ4d/ Q10	•	•	•	•	•
AQ5	•	•	•	•	•

Note. Numbering in **green** represents questions (e.g. **Q9**) in final “top” ten numbering;
 Symbol • = the question was covered explicitly in the interview;
 Symbol ✓ = the question covered from responses and noted on précis;
 ‘not’ = the question was not covered.

Canadian interviews were done in 1 sitting.

Table K2 *Interview Questions Covered in Lithuania*

Question	LT-Coord	LT-1; LT-Admin1, LT-Teach1	LT-1; LT-Teach1, LT-Teach 2, LT-Care	LT-2; LT-Admin2, LT-Teach3, LT-Teach4	LT-3; LT-Admin3, LT-Admin4	LT-3; LT-Teach5	LT-4; LT-Admin5	LT-4; LT-Teach6	LT-4; LT-Teach6
1/ Q1	•	•	•	•	•	•	•	•	•
2/ Q2	•	•	•	•	•	•	•	•	•
Book/ Q3	•	not	not	•	•	•	•	•	•
AQ1	•	not	•	•	•	•	•	•	•
AQ2a	•	not	•	•	not	•	•	•	not
AQ2b/ Q4	•	not	•	•	•	•	•	•	not
AQ2c	•	not	not	•	not	•	•	not	not
AQ2d/ Q5	•	not	•	•	not	•	•	•	•
AQ3i	•	not	not	•	✓	✓	not	not	not
AQ3a/ Q6	•	not	•	•	•	•	•	•	•
OQ5 /AQ3b	•	•	•	•	•	•	•	•	•
OQ10 /AQ3c Part A/ Q7	•	•	•	•	•	•	•	•	•
OQ11 /AQ3c Part B/ Q8	•	•	not	✓	not	•	✓	•	•
OQ4 /AQ3d	•	•	•	•	not	not	not	not	not
AQ4a/ Q9	•	not	•	•	•	•	•	•	•
AQ4b	•	not	•	•	•	•	•	•	•
AQ4c/ Q10	•	not	•	•	•	•	•	•	•
AQ4d/ Q10	•	not	•	•	•	•	•	•	•
12 /AQ5	•	•	•	•	•	•	•	•	•
OQ3	•	•							
OQ4	•	•							
OQ7	•	•							
OQ8	•	•							
OQ9	•	•							

Note. Original interview questions (e.g. **OQ3**) shown in blue; alternate questions (e.g. AQ4b) in black; Numbering in green represents questions (e.g. **Q9**) in final “top” ten numbering; Symbol • = the question was covered explicitly in the interview; Symbol ✓ = the question covered from responses and noted on précis; ‘not’ = the question was not covered.

Lithuanian interviews were done in 1–3 sitting(s).

Table K3 *Interview Questions Covered in Sweden*

Question	SV-Coord	SV-1	SV-2
1/ Q1	•	•	•
2/ Q2	•	•	•
Book/ Q3	•	•	•
AQ1	•	not	•
AQ2a	not	not	not
AQ2b/ Q4	•	•	•
AQ2c	•	•	not
AQ2d/ Q5	•	not	•
AQ3i	not	not	•
AQ3a/ Q6	•	•	•
AQ3b	•	✓	•
AQ3c Part A/ Q7	•	•	•
AQ3c Part B/ Q8	✓	•	✓
AQ3d	•	not	not
AQ4a/ Q9	•	•	•
AQ4b	•	•	•
AQ4c/ Q10	not	•	•
AQ4d/ Q10	not	•	•
AQ5	•	•	•

Note. Numbering in **green** represents questions (e.g. **Q9**) in final “top” ten numbering;
 Symbol • = the question was covered explicitly in the interview;
 Symbol ✓ = the question covered from responses and noted on précis;
 ‘not’ = the question was not covered.

Swedish interviews were done in 1 sitting.

Appendix L: Top Ten Interview Questions

Number	Question
Interpretation	
Q1/Q1	What does ‘education for sustainability’ mean to you?
Connection	
Q2/Q2	What was it that first brought you to issues of sustainability?
Q3/Book Excerpt	How is it that... we have not created utopia? ... but ultimately, are all a part of it.
Q4/AQ2b	By what means might society progress in the 21 st century, while ensuring generations to come inherit a living Earth?
Q5/AQ2d	How would you characterize the role of motivation (understanding the seriousness of a problem) versus hopefulness (feeling able to do something about it) in developing a liveable future?
Engagement	
Q6/AQ3a	How would you characterize the goals of the EcoSchools program?
Q7/OQ10/ AQ3c Part A	If you were to give advice to another teacher or school considering the EcoSchools program, what would you say the top five key success factors are? Describe some of your biggest successes.
Q8/OQ11/ AQ3c Part A	What are the three biggest challenges related to being an EcoSchool? Describe some of your biggest challenges, and how you surmounted them.
Q9/AQ4a	What are your own (and the school’s) goals for your school in going beyond certification?
Q10/AQ4c/d	AQ 4c) Which of the goals that you have met do you think would be part of your school program even without the EcoSchools program? [and] AQ 4d) Which of your goals has arisen because of the EcoSchools program?

Note. Numbering in **green** represents questions (e.g. **Q9**) in final “top” ten numbering; Questions from original interview schedule are in **blue** (e.g. **OQ10**); Questions from the alternate interview schedule are in black (e.g. AQ2b).

Appendix M: Summary of Thin and Thick Responses to Questions 1–10

Strand/Question	Thin Responses...	Thick Responses...
Interpretation/1 What does 'education for sustainability' mean to you?	<p>...focus on one or two driving forces such as the importance of taking action.</p> <p>Frequently made points: ESD involves carrying environmental message to and perhaps via students, mostly within school</p>	<p>...integrate a sense of discernment among choices of action, where critical thinking skills are emphasized; the wide and (to some extent) deep views are apparent.</p> <p>General note: In most disciplines, defining the key term would bring a narrow, focused response pattern, so the broad pattern seen here (including the most subthemes of all 10 questions) corroborates the observation that, within the academy, views on ESD or other variants have been diverging over time.</p> <p>Frequently made points: citizens are key outcome (and thus education is also key, with an authenticity of engagement inside and beyond the school – especially for Lithuanian participants), and need to be enabled to make choices (both thinking skills and practical experiences being important); key need is to increase global sustainability in future generations, expanding spheres of influence, and involving families and communities; ESD involves fostering optimism, accomplishing attitude and/or paradigm shift, balancing the three spheres holistically; ESD should be at the core of the school and the curriculum (Lithuania, Sweden); for some, ESD involves common ownership and a responsibility to solve problems; especially for the Lithuanians, a connection to nature is an explicit component of ESD</p> <p>Characteristic Stage 6 aspects: balancing the spheres of ESD; citizens as key outcome; longer time frames; paradigm shift</p>
Connection	<p>...tend to focus on what action might be taken in the present time and place.</p>	<p>...reveal a broader sense of connection to and leadership regarding the environment in nonproximal time and space; connecting caring about nature to action as educators emerges as a sign of topophilia combined with leadership.</p> <p>Key points from responses to Questions 2–5: early/ongoing connection to nature, seen as part of national identity; present possible solutions along with problems; importance of ecoliteracy in understanding, meeting challenges;</p>

2

What was it that first brought you to issues of sustainability?

...tend to reveal one particular draw to the field rather than a portfolio of impetus. This is one of just two questions in which thin responses focus on subthemes other than 'action'.

Frequently made points:

cultural, family, previous work and/or educational background; seeing environmental destruction; reducing energy costs; combining children with sustainability

need for a values-based behavioural/life shift toward sustainability – intellectual understanding easier to achieve than shift in behaviour;
need for deep shift in thinking, with a goal of environmentally aware citizenship;
understanding that change takes time, may well be generational;
pace of modern life, societal factors oppose change, difficult to sustain connection to nature;
lead by example and through care for students;
maintain hope by valuing students' ideas, overcoming negative information – environmental problems can motivate

Characteristic Stage 6 aspects:

strong emotional/spiritual connection to nature;
awareness of multiple perspectives and interconnections, seeing a bigger, societal picture, capturing multiple perspectives, interconnections and a wider range of anthropogenic problems;
seeking and developing solutions holistically;
shifting behaviours, values, and thinking, in society as well as schools;
empowerment of students with guidance (as opposed to direction)

...tend to reveal a personal draw to the field via a variety of impetus and an understanding of the need for action, with individuals revealing a clear influence and awareness (across roles) of the full dimension of time (mentioned in all thick responses), for the self and others.

Frequently made points:

family (including own children) and/or friends;
early/ongoing contact with nature, topophilia;
cultural and/or educational background;
Earth Day and/or Rio: Agenda 21;
longterm involvement with EE/ESD;
seeing loss of species;
concern for future generations, uncertainty;
seeing the value of concrete environmental action;
the desire to shift behaviours;
responsibility as an educator to lead;
teamwork, colleagues;
the value of environmental issues as a teaching hook, the cognitive aspect, artistic cross-over;
targeted by the EcoSchools program;
for Lithuanians, the post-Soviet discovery of environmental and land-ownership issues;
in Lithuania, seminars and conferences, administrator advice, some ministry mandating and curriculum shifts

3

[Book Excerpt] How is it that... we have not created utopia?

...tend to focus on pragmatic action. *Thin responses to this question are rare.*

Frequently made points:
not relevant because of big businesses, needs (Canadians); need thinking change

Characteristic Stage 6 aspects:

the desire to enable change in behaviours, values, and thinking, in society as well as schools;
a strong emotional connection to nature

...indicate their perspective of the self nested in a web of life and/or share insight into required action. Only the long view (core to the connection strand) is apparent, with responses tending to address the subthemes of topophilia, time, and connection.

Frequently made points:

spirituality, mindfulness, part of Earth, humility – environment controls us;
self-interest or altruism equally;
cultural background of students a factor;
national identity implies connection to nature (especially Lithuanians, also Canadians);
seeing that people care about environment;
numbing effect of modern, high-paced life;
historical factors;
if people forget, they'll be reminded;
scientific view shows connection;
need to return to nature, keep traditions alive (Lithuania) – fighting to retain connections, generational shift away; difficulty of doing what needs to be done;
ethical questions;
hard to change behaviours without supporting knowledge;
action as important as intellect

Characteristic Stage (5 or) 6 aspects:

awareness of multiple perspectives, interconnections, also impediments to connection as well as promoters

4

By what means might society progress in the 21st century, while ensuring generations to come inherit a living Earth?

...focus on actions considered or taken, some of which reflect emerging environmental leadership

Frequently made points:
correcting past mistakes;
generate activism in students;
infuse environmental content through the curriculum, in all grades;
renewable energy, conservation, lower emissions

...express essential qualities of taking responsibility to act, and reveal environmental leadership as reflected in making choices.

Frequently made points:

many human-made problems, possible solutions;
almost criminal not to act, need ecoliterate politicians, ecological economics, but cynicism about politics a problem;
balance based on consequences;
need economic incentives societally;
sustainability as part of identity and habits, need to change mindsets more than technological innovation, with value-based life shift;
environmentally aware citizenship as part of solution, so education is key;
good nature-smart practices (trips);
protect nature;

5

How would you characterize the role of motivation (understanding the seriousness of a problem) versus hopefulness (feeling able to do something about it) in developing a liveable future?

...focus on action to be taken to improve the environment, but with little or no perception that students can discover their own motivation. *Thin responses to this question are rare, with no thin responses by Swedish participants.*

Frequently made points:
the environment presents a serious problem, need solutions to survive;
keep simple, real, motivation is teacher's job or students may see for themselves; optimism

social structures and law must be reliable (Lithuania); international cooperation and help; kindness, democracy, equity – change will take time but be more sustainable if done democratically; lead by consistent example and care for students

Characteristic Stage 6 aspects:

seeing a wider range of anthropogenic problems, e.g. nuclear war threat, social security system, and taking a holistic approach to solutions

...feature thinking (dynamic view) and time as dominant subthemes, suggesting that the dynamic view acts “behind the scenes” to shape the other views, the resulting action(s) and the individual's sustainability profile. There is no consensus on the amount of motivation vs hope.

Frequently made points:

present solutions along with problems;
empower students to identify and solve problems thoughtfully, with multiple perspectives;
students need to experience concrete problems;
value students' ideas;
focus on “not too late”, overcome negative information, maintain hope for students; hope for long-term, gradual (even generational) attitude/thinking shift;
move beyond hope to action; seeing increased interest in environmental problems, which can motivate; lead by example; need the “why” *or* [conversely] students respond to short-term incentives;
societal factors oppose change, and habits are harder to shift than ignorance;
involve government more (Lithuania) to enable conservation

Characteristic Stage 6 aspects:

a focus on the motivation of students through empowerment with guidance; seeing the bigger picture

Engagement

...tend to interpret the program's focus being that of a club

...reflect a school-wide program seen as an opportunity to shape individuals and to interact with the broader community.

Key points from responses to Questions 6–10:

reduce/control costs (Canada) – can view as opportunity to interconnect three spheres; more generally, balancing sustainability against socioeconomic issues;
complexity of paperwork – or perhaps planning *seen as* paperwork;

6

How would you characterize the goals of the EcoSchools program?

...are dominated by the subtheme of action, particularly actions around conservation to be taken within the school itself.

Frequently made points:

conserve and (in Canada, Sweden) to save money;
develop a plan, get whole-school involvement (but only on conservation);
curriculum infusion, awareness;
healthy living

inter-role, infrastructure and staff resistance problems;
teamwork *or* [conversely] team limitations;
building authentically, sustaining the program long-term;
problems such as teacher overwork, students not grasping complexities, engaged students being overstretched;
empower and increase awareness for students and teachers (consensus teaching), getting them authentically involved, leading – key to program success – thus producing fully engaged citizens;
good communication between players;
school to be sustainable, whole-school program, imaginative and effective beyond-school involvement; keep evolving program;
real goals are ecoliteracy, sustainability, harmony with nature

Characteristic Stage 6 aspects:

a more behind-the-scenes, societal view;
process emphasis, seeing/overcoming barriers to awareness;
focus on citizenship – point of maximizing student involvement is to foster their leadership;
problems of multiple players in the program, challenge to integrate the program to be whole-school;
consciously shifting thinking

...go beyond the ‘what’ to the ‘why’, reflecting the idea that environmental literacy (the most frequent subtheme) involves assuming responsibility to take action independently of the priorities of others. Only the deep view (core to the engagement strand) is apparent.

Frequently made points:

reduce/control costs (Canada), but there is tension between this and personal view of goals;
audit structure, complex process to be negotiated;
empower and increase awareness for students and teachers (consensus teaching), produce citizens engaged in communities and the democratic process as problem-solvers;
real goals are ecoliteracy, sustainability, harmony with nature;
seeing larger, multischool picture, pooling ideas

Characteristic Stage 6 aspects:

a more behind-the-scenes view; focus on citizenship (also Stage 5)

7

Describe some of your biggest successes.

...focus on one or two actions that align strongly with good general educational practice.

Frequently made points:

successes mostly around recycling/energy goals; teamwork, success of (preexisting) club, leading by example; specific successes e.g. veggie lunch, birdhouses, tree plantings, bottle boat; improved understanding for students; some community impact; extending to pre-school children [but therefore this would be adult-oriented]; visits to power & processing plants

...point to the intertwining of a sense of responsibility and personal motivation shaping the action taken. Either multiple successes are mentioned, or else individual successes are unpacked for their significance. All four subthemes associated with the deep view are apparent.

Frequently made points:

raising status of environmental behaviours, issues; interconnection of three spheres via reducing costs, protecting jobs; empowering students, getting them *fully, responsibly, imaginatively* [i.e. authentically] involved and *leading*; student presentations *to other staff, younger students in feeder schools*; active committees retain students; imaginative and effective beyond-school involvement; special courses; specific successes e.g. tree plantings, ancient corn, peace garden, innovative cleaning schedule/scent-free environment; teamwork; curriculum success and failure seen; perpetuating success of program beyond early cohorts; celebrate from start, build on program via conferences, competitions, internationally (Lithuanian participants); certification reflects real accomplishments; creating a new view within society

Characteristic Stage 6 aspects:

seeing a society-scale picture, ripple effects; throughout-process maximizing of student involvement to really “win” them, let *them* drive program

8

Describe some of your biggest challenges, and how you surmounted them.

...tend to reflect aspects of problems faced in implementing the EcoSchools program, with some individuals outlining the beginnings of solutions as well, which may relate to addressing motivational issues. This is one of just two questions in which thin responses focus on subthemes other than ‘action’.

Frequently made points:

difficulty of including environmental content, depending on subject to which it is designated (e.g., ESL harder

...tend to reflect the complexities of problems and solutions, involving clarity of individual motivation, shared responsibility and time as a limited commodity but extended over longer timeframes. All thick responses mention multiple barriers & drivers, with time, motivation, and responsibility also popular subthemes, with the subtheme of action not much touched upon.

Frequently made points:

problems of definition; challenges around inclusion; team limitations i.e. consensus, speed of slowest, scheduling; resistance to addressing the social dimension [i.e. the EE → ESD shift];

than Family Studies);
 program perceived as “uncool”;
 lack of allies/buy-in;
 raising money (Lithuania,
 Sweden);
 getting students active/involved;
 lack of cost savings

in Canada, problems such as caretakers and
 principals never being in the same room, unused
 resources, politics problems in teaching, union
 issues, lack of staff buy-in/high turnover, short
 support staffing, infrastructure/recycling support
 issues;
 developing techniques to access candidate schools;
 resistance to paperwork or rather planning *seen as*
 paperwork;
 building authentically, sustaining the program long-
 term;
 misfocus at both conservation and national policy
 levels;
 lack of ministry support (Canada and Lithuania) for
 environmental content [subsequently this has been
 introduced in Ontario science curricula], students
 not opting for Geography;
 overwork, overpacked curriculum;
 tough creating experiential opportunities;
 teen irresponsibility, lack of any rural exposure,
 “uncool” factor, consumerism, (increasing) societal
 indifference;
 students unaware of complexities;
 engaged students are overstretched;
 program structural problems: getting the balance
 right, need to go beyond documentation;
 lack of money (Lithuania);
 involving parents;
 lack of allies;
 balancing sustainability against econosocial issues;
 cost/availability of organic food (Sweden) –
 solution to work with businesses, community

Characteristic Stage 6 aspects:

problems of multiple players in the program itself –
 resolve through discussion (if possible);
 seeing/overcoming barriers to awareness; big
 picture, going beyond program

9

What are your own (and
 the school’s) goals for
 your school in going
 beyond certification?

...reflect emerging responsibility
 through action taken, showing a
 trend of harmonizing behaviours
 at school and elsewhere (e.g., the
 home)

Frequently made points:

increase own awareness, do more
 at home and school;
 broaden students’ minds;
 maintain student involvement,
 get other teachers involved;
 more curriculum integration;
 expand conservation activities;

...tend to integrate an independent understanding of
 responsibility to take action, as participants reveal
 environmental awareness beyond the school realm

Frequently made points:

have everyone in school thinking and acting
 sustainably, and out into families, community;
 students to become more active now and as future
 citizens;
 bring change into society, even internationally;
 work on personal life, learning;
 keep (multiple) programs going, deepen program;
 tackle infrastructure issues;
 share good practices;

	focus on process more than product	visible results, projects Characteristic Stage 6 aspects: <i>responsibility</i> to go beyond the program and the school; enable students to keep learning after school; visible results
10 Which of the goals that you have met do you think would be part of your school program even without the EcoSchools program? Which of your goals has arisen because of the EcoSchools program?	...focus on action to reduce environmental impact or show realization of the particular sustainability goals of the school. Frequently made points: school already recycling, program brought a bit more ecoliteracy in some cases; some new layers of conservation due to program; efforts, students slightly more focused due to program; some ideas from other sources; came to program because already environmentally minded	...reflect the importance of taking responsibility to integrate sustainability practices throughout the school, with an emphasis on the value of process over outcome. <i>Thick responses to this question are somewhat rare; all of them touch on action and integration.</i> Frequently made points: as individual, need framework – systems thinking, topophilia etc., now shifted to fully connected/balanced ESD model; difficult to incorporate all three spheres of ESD; organization becoming multi-ocular; key to sustainability as well as success of program is students; communication between players important to support program; keep evolving program; already environmental school, driven by geography curriculum, program just gave focus; most important is for school to be sustainable, i.e. process over outcomes; self-selection reinforces sustainability of schools; shift from club to whole-school program; already involved at community level Characteristic Stage 6 aspects: consciously shifting thinking; quality of citizenship; process emphasis, in particular participation in the program being emergent; integrating the program to be whole-school

Appendix N: Raw Data of Précis Analysis in Each Nation

Table N1 *Raw Data for Canadian Participants*

Question	Thick response		Thin response		No response
Interpretation					
Q1/Q1	CA-Coord ^a CA-Admin1 CA-Teach1 CA-Teach3 ^a	CA-Teach4 CA-Teach5 CA-Teach6	CA-Teach2 ^a CA-Teach7		CA-Admin2 ^b
Connection					
Q2/Q2	CA-Coord CA-Admin1 CA-Teach1 ^a CA-Teach3 ^a	CA-Teach4 CA-Teach5 ^a CA-Teach7	CA-Teach2 CA-Teach6 ^a		CA-Admin2 ^b
Q3/Book	CA-Coord ^a CA-Admin1 ^a CA-Teach1	CA-Teach3 CA-Teach4 ^a CA-Teach7 ^a	CA-Teach5 ^a CA-Teach6 ^a		CA-Admin2 ^b CA-Teach2
Q4/AQ2b	CA-Coord CA-Admin1 ^a CA-Teach1	CA-Teach3 ^a CA-Teach4 CA-Teach6	CA-Teach2 CA-Teach7 ^a		CA-Admin2 ^b CA-Teach5
Q5/AQ2d	CA-Coord CA-Admin1 CA-Teach1	CA-Teach5 CA-Teach6	CA-Teach2 CA-Teach7 ^a		CA-Admin2 ^b CA-Teach3 CA-Teach4
Engagement					
Q6/AQ3a	CA-Coord CA-Admin1	CA-Teach1 CA-Teach2	CA-Teach3 CA-Teach4	CA-Teach6 ^a CA-Teach7	CA-Admin2 ^b CA-Teach5
Q7/AQ3c	CA-Coord CA-Admin1 CA-Admin2 ^a CA-Teach1 ^a	CA-Teach3 ^a CA-Teach5 CA-Teach7	CA-Teach2 CA-Teach4 ^a CA-Teach6		
Q8/AQ3cPt2	CA-Coord CA-Admin1 ^a CA-Admin2 CA-Teach1 ^a	CA-Teach3 ^a CA-Teach4 CA-Teach5 CA-Teach6	CA-Teach7 ^a		CA-Teach2
Q9/AQ4a	CA-Coord ^a CA-Teach1 CA-Teach2 ^a CA-Teach3	CA-Teach4 CA-Teach5 ^a CA-Teach6	CA-Admin1 ^a		CA-Admin2 ^b CA-Teach7
Q10/AQ4c/d	CA-Coord ^a CA-Teach6 ^a		CA-Admin1 CA-Teach1 CA-Teach2 CA-Teach3	CA-Teach4 CA-Teach5 CA-Teach7 ^a	CA-Admin2 ^b

Note. There were 10 participants involved;

Numbering in **green** represents questions (e.g. **Q9**) in final “top” ten numbering.

^a Participants whose Thick responses were used in coding;

^b Participant *CA-Admin2* responses dropped from final analysis due to lack of data in aggregate.

Table N2 *Raw Data for Lithuanian Participants*

Question	Thick response		Thin response		No response	
Interpretation						
Q1/Q1	LT-Coord	LT-Teach3	LT-Admin4 ^a		LT-Admin3	
	LT-Admin1	LT-Teach4	LT-Teach1			
	LT-Admin2 ^a	LT-Teach5	LT-Care			
	LT-Admin5	LT-Teach6				
	LT-Teach2	LT-Teach7				
Connection						
Q2/Q2	LT-Coord ^a	LT-Teach3	LT-Admin4 ^a		LT-Admin3	
	LT-Admin1 ^a	LT-Teach4	LT-Care			
	LT-Admin2	LT-Teach5				
	LT-Admin5	LT-Teach6				
	LT-Teach1	LT-Teach7				
	LT-Teach2					
Q3/Book	LT-Coord	LT-Teach3			<i>LT-Admin1^b</i>	
	LT-Admin2 ^a	LT-Teach4 ^a			LT-Teach1	
	LT-Admin3	LT-Teach5			LT-Teach2	
	LT-Admin4	LT-Teach6			LT-Care	
	LT-Admin5 ^a	LT-Teach7				
Q4/AQ2b	LT-Coord	LT-Teach2 ^a	LT-Teach1		<i>LT-Admin1^b</i>	
	LT-Admin2	LT-Teach3	LT-Teach5 ^a		LT-Teach6	
	LT-Admin3 ^a	LT-Teach4 ^a	LT-Care			
	LT-Admin4 ^a	LT-Teach7				
	LT-Admin5					
Q5/AQ2d	LT-Coord	LT-Teach3	LT-Teach1		<i>LT-Admin1^b</i>	
	LT-Admin2	LT-Teach5 ^a	LT-Care ^a		LT-Admin3	
	LT-Admin5	LT-Teach6			LT-Admin4	
	LT-Teach2 ^a	LT-Teach7 ^a			<i>LT-Teach4^b</i>	
Engagement						
Q6/AQ3a	LT-Coord ^a	LT-Teach3 ^a	LT-Admin3	LT-Teach5	<i>LT-Admin1^b</i>	
	LT-Admin2 ^a	LT-Teach6	LT-Admin4 ^a	LT-Teach7	<i>LT-Teach4^b</i>	
	LT-Teach2		LT-Admin5	LT-Care		
Q7/AQ3c			LT-Teach1			
	LT-Coord	LT-Teach1	LT-Admin4		<i>LT-Teach4^b</i>	
	LT-Admin1 ^a	LT-Teach3	LT-Teach2 ^a			
	LT-Admin2	LT-Teach5 ^a	LT-Teach7			
	LT-Admin3	LT-Teach6	LT-Care			
Q8/AQ3cPt2	LT-Coord	LT-Admin5	LT-Teach5 ^a		LT-Admin3	LT-Teach3
	LT-Admin1 ^a	LT-Teach1	LT-Teach7 ^a		LT-Admin4	<i>LT-Teach4^b</i>
	LT-Admin2	LT-Teach6			LT-Teach2	LT-Care
Q9/AQ4a	LT-Coord ^a	LT-Admin4	LT-Admin5	LT-Teach5	<i>LT-Admin1^b</i>	
	LT-Admin2 ^a	LT-Teach3	LT-Teach1	LT-Care ^a	<i>LT-Teach4^b</i>	
	LT-Admin3	LT-Teach6 ^a	LT-Teach2 ^a		LT-Teach7	

Table continues...

Question	Thick response	Thin response		No response
Q10/AQ4c/d	LT-Coord ^a	LT-Admin2 ^a	LT-Teach3	<i>LT-Admin1^b</i>
	LT-Admin4	LT-Admin3	LT-Teach5	<i>LT-Teach4^b</i>
	LT-Teach6 ^a	LT-Admin5	LT-Teach7	LT-Teach1
		LT-Teach2 ^a	LT-Care	

Note. There were 14 participants involved;

Numbering in **green** represents questions (e.g. **Q9**) in final “top” ten numbering.

^a Participants whose Thick responses were used in coding;

^b Participants in *italics*: responses dropped from final analysis due to lack of data in aggregate.

Table N3 *Raw Data for Swedish Participants*

Question	Thick response		Thin response		No response	
Interpretation						
Q1/Q1	SV-Coord ^a SV-Admin2	SV-Teach2 ^a	SV-Admin1 ^a SV-Teach1	SV-Care		
Connection						
Q2/Q2	SV-Admin2 ^a SV-Teach1 ^a	SV-Teach2	SV-Coord ^a SV-Admin1	SV-Care		
Q3/Book	SV-Coord SV-Admin1 ^a SV-Admin2	SV-Teach2 SV-Care ^a			SV-Teach1	
Q4/AQ2b	SV-Coord SV-Admin2	SV-Teach2 ^a SV-Care ^a	SV-Admin1 ^a SV-Teach1			
Q5/AQ2d		SV-Coord ^a SV-Teach2 ^a			SV-Admin1 SV-Admin2	SV-Teach1 SV-Care
Engagement						
Q6/AQ3a		SV-Coord ^a	SV-Admin1 SV-Admin2 SV-Teach1	SV-Teach2 ^a SV-Care		
Q7/AQ3c		SV-Admin2 SV-Teach2 ^a	SV-Coord ^a SV-Admin1	SV-Teach1	SV-Care	
Q8/AQ3cPt2	SV-Coord SV-Admin2	SV-Teach2 ^a	SV-Admin1 SV-Teach1 ^a	SV-Care		
Q9/AQ4a		SV-Coord ^a	SV-Admin1 SV-Admin2 ^a	SV-Teach1 SV-Teach2	SV-Care	
Q10/AQ4c/d		SV-Teach2 ^a	SV-Admin1 SV-Admin2	SV-Teach1 ^a	SV-Coord SV-Care	

Note. There were 6 participants involved;

Numbering in **green** represents questions (e.g. **Q9**) in final “top” ten numbering.

^a Participants whose Thick responses were used in coding.

Appendix O: Summary of All Raw Data of Précis Analysis

Person code ^a	Interpretation	Connection ^b	Engagement ^c	Designated stage
CA-Coord	T	0 τ ; 4 T	0 τ ; 5 T	6
CA-Admin1	T	0 τ ; 4 T	2 τ ; 3 T	5
<i>CA-Admin2</i>	<i>No</i>	<i>4 No</i>	<i>0 τ; 2 T; 3 No</i>	—
CA-Teach1	T	0 τ ; 4 T	1 τ ; 4 T	5
CA-Teach2	τ	3 τ ; 1 No	2 τ ; 2 T; 1 No	2
CA-Teach3	T	0 τ ; 3 T; 1 No	1 τ ; 3 T; 1 No	5
CA-Teach4	T	0 τ ; 3 T; 1 No	2 τ ; 2 T; 1 No	4
CA-Teach5	T	$\frac{1}{4}$ τ ; 2 T; 1 No	1 τ ; 3 T; 1 No	5
CA-Teach6	T	2 τ ; 2 T	2 τ ; 3 T	5
CA-Teach7	τ	2 τ ; 2 T	3 τ ; 1 T; 1 No	2
LT-Coord	T	0 τ ; 4 T	0 τ ; 5 T	6
<i>LT-Admin1</i>	<i>T</i>	<i>0 τ; 1 T; 3 No</i>	<i>0 τ; 2 T; 3 No</i>	—
LT-Admin2	T	0 τ ; 4 T	1 τ ; 4 T	5
LT-Admin3	No	0 τ ; 2 T; 2 No	2 τ ; 2 T; 1 No	3
LT-Admin4	τ	$\frac{1}{4}$ τ ; 2 T; 1 No	2 τ ; 2 T; 1 No	3
LT-Admin5	T	0 τ ; 4 T	3 τ ; 2 T	4
LT-Teach1	τ	2 τ ; 1 T; 1 No	2 τ ; 2 T; 1 No	2
LT-Teach2	T	0 τ ; 3 T; 1 No	3 τ ; 1 T; 1 No	4
LT-Teach3	T	0 τ ; 4 T	1 τ ; 3 T; 1 No	5
<i>LT-Teach4</i>	<i>T</i>	<i>0 τ; 3 T; 1 No</i>	<i>5 No</i>	—
LT-Teach5	T	$\frac{1}{4}$ τ ; 3 T	4 τ ; 1 T	4
LT-Teach6	T	0 τ ; 3 T; 1 No	0 τ ; 5 T	6
LT-Teach7	T	0 τ ; 4 T	4 τ ; 0 T; 1 No	4
LT-Care	τ	$\frac{3}{4}$ τ ; 0 T; 1 No	4 τ ; 0 T; 1 No	1
SV-Coord	T	$\frac{1}{4}$ τ ; 3 T	1 τ ; 3 T; 1 No	5
SV-Admin1	τ	2 τ ; 1 T; 1 No	5 τ ; 0 T	2
SV-Admin2	T	0 τ ; 3 T; 1 No	3 τ ; 2 T	4
SV-Teach1	τ	$\frac{1}{4}$ τ ; 1 T; 2 No	5 τ ; 0 T	2
SV-Teach2	T	0 τ ; 4 T	2 τ ; 3 T	5
SV-Care	τ	$\frac{1}{4}$ τ ; 2 T; 1 No	2 τ ; 0 T; 3 No	3

Note. One question associated with ‘interpretation’, four questions associated with ‘connection’ and five questions associated with ‘engagement’.

τ = Thin; T = Thick; No = No response (not asked, or not answered).

^a Participants in *italics*: responses dropped from final analysis due to lack of data in the aggregate.

^b All data out of a total of four questions in this strand

^c All data out of a total of five questions in this strand

Appendix P: Summary of Stage of Participants by School and Role

Coordinators/Schools	Role	Stage
CA-Coord	CA-Coord	6
CA-1	CA-Admin1	5
	CA-Teach1	5
	CA-Teach2	2
CA-2	CA-Teach3	5
	CA-Teach4	4
CA-3	CA-Teach5	5
	CA-Teach6	5
CA-4	CA-Admin2	n/a
	CA-Teach7	2
LT-Coord	LT-Coord	6
LT-1	LT-Admin1	n/a
	LT-Teach1	2
	LT-Teach2	4
	LT-Care	1
LT-2	LT-Admin2	5
	LT-Teach3	5
	LT-Teach4	n/a
LT-3	LT-Admin3	3
	LT-Admin4	3
	LT-Teach5	4
LT-4	LT-Admin5	4
	LT-Teach6	6
	LT-Teach7	4
SV-Coord	SV-Coord	5
SV-1	SV-Admin1	2
	SV-Teach1	2
	SV-Care	3
SV-2	SV-Admin2	4
	SV-Teach2	5

Note. ‘n/a’ means that there was insufficient data available for these three participants to identify them by stage.

Appendix Q: Summary of Participants' Backgrounds by Nation and Stage

Nation	Number of participants	Average age (age range) of group of participants ^a	Average (range of) number of years of education experience
Stage 1			
Canada	0	0	0
Lithuania	1	65.0	17.0
Sweden	0	0	0
Total	1	65.0	17.0
Stage 2			
Canada	2	40.0 (20s–50s)	8.0 (3.0–13.0)
Lithuania	1	55.0	30.0
Sweden	2	55.0	7.0 (6.0–8.0)
Total	5	49.0 (20s–50s)	12.0 (3.0–30.0)
Stage 3			
Canada	0	0	0
Lithuania	2	55.0	28.5 (24.0–33.0)
Sweden	1	55.0	3.0
Total	3	55.0	20.0 (3.0–33.0)
Stage 4			
Canada	1	35.0	7.0
Lithuania	4	42.5 (30s–50s)	19.5 (15.0–29.0)
Sweden	1	65.0	18.0
Total	6	45.0 (30s–60s)	17.2 (7.0–29.0)
Stage 5			
Canada	5	47.0 (30s–50s)	17.8 (5.0–27.0)
Lithuania	2	60.0 (50s–60s)	32.0 (29.0–35.0)
Sweden	2	30.0 (20s–30s)	3.0 (2.0–4.0)
Total	9	46.1 (20s–60s)	17.7 (2.0–35.0)
Stage 6			
Canada	1	45.0	20.0
Lithuania	2	35.0 (20s–40s)	13.0 (2.0–24.0)
Sweden	0	0	0
Total	3	38.3 (20s–40s)	15.3 (2.0–24.0)
Overall			
Canada	9	43.9 (20s–50s)	15.3 (3.0–27.0)
Lithuania	12	49.2 (20s–60s)	22.3 (2.0–35.0)
Sweden	6	48.3 (20s–60s)	6.8 (2.0–18.0)
Total	27	47.2 (20s–60s)	16.9 (2.0–35.0)

Note. ^a Age data are based on the midpoint for each 10-year age range in the questionnaire.

Appendix R: Number of Subthemes for Ten Interview Questions

Question	Total number of subthemes	Thick responses' number of subthemes (common & particular)	Thin responses' number of subthemes
1	17	3–8 (common & particular)	1–2
2	16	3–9 (common & particular)	1
3	9	2–4 (<u>only</u> common)	1
4	9	2–4 (<u>only</u> common)	1
5	16	3–7 (common & particular)	1
6	7	3–4 (common & particular)	1
7	9	3–5 (<u>only</u> common)	1–2
8	10	2–6 (common or particular)	1
9	12	3–5 (<u>only</u> common)	1
10	9	3–5 (common & particular)	1–2

Appendix S: Subthemes Data Tables for Ten Interview Questions

Table S1 ***Q1** Subthemes by Sample Participant*

		Common subthemes																	Particular subthemes					
Stage	Participant	action	choices	time	balance	citizen	interconnections	leadership	responsibility	thinking	consequences	imperfect	independence	patience	motivation	one person	personal	topophilia	values	three ESD spheres	appropriate scale of action	real life	daily activities	Total
6	CA-Coord	1		1				1				1								1	1			6
6	LT-Coord																							
6	LT-Teach6	1		1	1			1					1	1						1		1		8
5	CA-Admin1																							
5	CA-Teach1																							
5	CA-Teach3	1	1				1				1	1									1	1		7
5	CA-Teach5																							
5	CA-Teach6	1	1	1					1	1														5
5	LT-Admin2			1			1	1	1												1			5
5	LT-Teach3	1	1		1																			3
5	SV-Coord	1	1							1														3
5	SV-Teach2																							
4	CA-Teach4					1	1		1												1			4
4	LT-Admin5																							
4	LT-Teach2																							
4	LT-Teach5		1		1	1					1									1				5
4	LT-Teach7																							
4	SV-Admin2									1			1									1		3
3	LT-Admin3																							
3	LT-Admin4																							
3	SV-Care																							
2	CA-Teach2																							
2	CA-Teach7																							
2	LT-Teach1																							
2	SV-Admin1																							
2	SV-Teach1																							
1	LT-Care																							
0	CA-Admin2																							
0	LT-Admin1																							
0	LT-Teach4	1	1			1															1			4
	Total	7	6	4	3	3	3	3	3	3	2	2	2	1	0	0	0	0	0	3	3	3	2	53

Note. Common subthemes appear in two or more questions. Particular subthemes appear in this question only.
Sample participants for this question are backgrounded in yellow. Subthemes *not* in bold did not appear in *sample* participants' responses.

Table S2 *Q2 Subthemes by Sample Participant*

		Common subthemes																	Particular subthemes		
Stage	Participant	time	personal	action	choices	interconnections	one person	balance	citizen	consequences	independence	leadership	responsibility	thinking	topophilia	values	imperfect	motivation	patience	multiple impetus	Total
6	CA-Coord																				
6	LT-Coord	1		1			1									1					4
6	LT-Teach6																				
5	CA-Admin1																				
5	CA-Teach1	1	1			1									1					1	5
5	CA-Teach3	1	1						1											1	4
5	CA-Teach5	1	1		1		1			1	1		1	1						1	9
5	CA-Teach6																				
5	LT-Admin2																				
5	LT-Teach3																				
5	SV-Coord																				
5	SV-Teach2																				
4	CA-Teach4																				
4	LT-Admin5	1		1																1	3
4	LT-Teach2																				
4	LT-Teach5																				
4	LT-Teach7																				
4	SV-Admin2	1	1		1															1	4
3	LT-Admin3																				
3	LT-Admin4																				
3	SV-Care																				
2	CA-Teach2																				
2	CA-Teach7																				
2	LT-Teach1	1	1	1																1	4
2	SV-Admin1																				
2	SV-Teach1	1	1	1																	3
1	LT-Care																				
0	CA-Admin2																				
0	LT-Admin1	1		1		1		1				1								1	6
0	LT-Teach4																				
	Total	9	6	5	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	7	42

Table S3 *Q3 Subthemes by Sample Participant*

		Common subthemes																		
Stage	Participant	topophilia	time	interconnections	citizen	action	values	consequences	leadership	personal	balance	choices	imperfect	independence	motivation	one person	patience	responsibility	thinking	Total
6	CA-Coord	1		1																2
6	LT-Coord																			
6	LT-Teach6																			
5	CA-Admin1		1	1		1	1													4
5	CA-Teach1																			
5	CA-Teach3																			
5	CA-Teach5																			
5	CA-Teach6																			
5	LT-Admin2	1	1																	2
5	LT-Teach3																			
5	SV-Coord																			
5	SV-Teach2																			
4	CA-Teach4	1	1		1															3
4	LT-Admin5				1		1													2
4	LT-Teach2																			
4	LT-Teach5																			
4	LT-Teach7	1	1	1																3
4	SV-Admin2																			
3	LT-Admin3	1	1		1															3
3	LT-Admin4																			
3	SV-Care	1	1		1		1													4
2	CA-Teach2																			
2	CA-Teach7	1		1		1				1										4
2	LT-Teach1																			
2	SV-Admin1	1		1		1		1												4
2	SV-Teach1																			
1	LT-Care																			
0	CA-Admin2																			
0	LT-Admin1																			
0	LT-Teach4	1							1											2
	Total	9	6	5	4	3	3	1	1	1	0	0	0	0	0	0	0	0	0	33

Table S4 *Q4 Subthemes by Sample Participant*

		Common subthemes																		
Stage	Participant	action	time	leadership	responsibility	choices	consequences	motivation	balance	thinking	citizen	imperfect	independence	interconnections	one person	patience	personal	topophilia	values	Total
6	CA-Coord			1		1	1		1											4
6	LT-Coord																			
6	LT-Teach6																			
5	CA-Admin1	1						1												2
5	CA-Teach1																			
5	CA-Teach3					1	1		1											3
5	CA-Teach5																			
5	CA-Teach6	1						1												2
5	LT-Admin2																			
5	LT-Teach3																			
5	SV-Coord																			
5	SV-Teach2		1			1														2
4	CA-Teach4																			
4	LT-Admin5																			
4	LT-Teach2		1	1						1										3
4	LT-Teach5																			
4	LT-Teach7																			
4	SV-Admin2																			
3	LT-Admin3	1	1		1															3
3	LT-Admin4	1			1															2
3	SV-Care	1			1															2
2	CA-Teach2																			
2	CA-Teach7																			
2	LT-Teach1																			
2	SV-Admin1																			
2	SV-Teach1																			
1	LT-Care																			
0	CA-Admin2																			
0	LT-Admin1																			
0	LT-Teach4	1		1																2
Total		6	3	3	3	3	2	2	2	1	0	0	0	0	0	0	0	0	0	25

Table S5 *Q5 Subthemes by Sample Participant*

		Common subthemes																Particular subthemes				
Stage	Participant	thinking	time	action	balance	choices	independence	leadership	imperfect	motivation	one person	patience	personal	responsibility	values	citizen	consequences	interconnections	topophilia	change (nature of)	examples (concrete)	Total
6	CA-Coord																					
6	LT-Coord																					
6	LT-Teach6																					
5	CA-Admin1		1	1																1		3
5	CA-Teach1																					
5	CA-Teach3																					
5	CA-Teach5	1	1						1			1								1		5
5	CA-Teach6																					
5	LT-Admin2																					
5	LT-Teach3																					
5	SV-Coord	1		1	1	1	1														1	6
5	SV-Teach2				1						1										1	3
4	CA-Teach4																					
4	LT-Admin5																					
4	LT-Teach2	1		1		1	1	1					1								1	7
4	LT-Teach5	1	1							1					1							4
4	LT-Teach7		1					1						1						1		4
4	SV-Admin2																					
3	LT-Admin3																					
3	LT-Admin4																					
3	SV-Care																					
2	CA-Teach2																					
2	CA-Teach7																					
2	LT-Teach1																					
2	SV-Admin1																					
2	SV-Teach1																					
1	LT-Care																					
0	CA-Admin2																					
0	LT-Admin1																					
0	LT-Teach4																					
	Total	4	4	3	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	3	3	32

Table S6 *Q6 Subthemes by Sample Participant*

		Common subthemes																	Particular subthemes		
Stage	Participant	action	responsibility	citizen	independence	time	one person	balance	choices	consequences	imperfect	interconnections	leadership	motivation	patience	personal	thinking	topophilia	values	environmental literacy	Total
6	CA-Coord																				
6	LT-Coord	1	1	1																1	4
6	LT-Teach6																				
5	CA-Admin1		1				1													1	3
5	CA-Teach1	1				1														1	3
5	CA-Teach3																				
5	CA-Teach5																				
5	CA-Teach6																				
5	LT-Admin2			1		1														1	3
5	LT-Teach3	1	1		1																3
5	SV-Coord	1			1															1	3
5	SV-Teach2																				
4	CA-Teach4																				
4	LT-Admin5																				
4	LT-Teach2																				
4	LT-Teach5																				
4	LT-Teach7																				
4	SV-Admin2																				
3	LT-Admin3																				
3	LT-Admin4																				
3	SV-Care																				
2	CA-Teach2																				
2	CA-Teach7																				
2	LT-Teach1																				
2	SV-Admin1																				
2	SV-Teach1																				
1	LT-Care																				
0	CA-Admin2																				
0	LT-Admin1																				
0	LT-Teach4																				
	Total	4	3	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	5	19

Table S7 *Q7 Subthemes by Sample Participant*

Stage	Participant	Common subthemes																		Total
		action	responsibility	independence	leadership	motivation	thinking	time	one person	consequences	balance	choices	citizen	imperfect	interconnections	patience	personal	topophilia	values	
6	CA-Coord																			
6	LT-Coord	1	1			1														3
6	LT-Teach6				1	1	1													3
5	CA-Admin1																			
5	CA-Teach1	1	1					1	1											4
5	CA-Teach3	1	1		1			1												4
5	CA-Teach5																			
5	CA-Teach6																			
5	LT-Admin2																			
5	LT-Teach3	1		1			1		1	1										5
5	SV-Coord																			
5	SV-Teach2			1	1		1													3
4	CA-Teach4																			
4	LT-Admin5																			
4	LT-Teach2																			
4	LT-Teach5	1		1			1													3
4	LT-Teach7																			
4	SV-Admin2	1	1			1														3
3	LT-Admin3																			
3	LT-Admin4																			
3	SV-Care																			
2	CA-Teach2																			
2	CA-Teach7																			
2	LT-Teach1																			
2	SV-Admin1																			
2	SV-Teach1																			
1	LT-Care																			
0	CA-Admin2	1		1	1			1												4
0	LT-Admin1	1	1			1														3
0	LT-Teach4																			
Total		8	5	4	4	4	4	3	2	1	0	0	0	0	0	0	0	0	0	35

Table S8 *Q8 Subthemes by Sample Participant*

		Common subthemes																	Particular Subthemes		
Stage	Participant	time	motivation	responsibility	independence	action	interconnections	leadership	one person	values	balance	choices	citizen	consequences	imperfect	patience	personal	thinking	topophilia	multiple barriers/drivers	Total
6	CA-Coord																				
6	LT-Coord																				
6	LT-Teach6	1	1	1	1		1													1	6
5	CA-Admin1	1	1			1			1											1	5
5	CA-Teach1		1																	1	2
5	CA-Teach3	1																		1	2
5	CA-Teach5																				
5	CA-Teach6																				
5	LT-Admin2																				
5	LT-Teach3																				
5	SV-Coord																				
5	SV-Teach2			1	1			1												1	4
4	CA-Teach4	1																		1	2
4	LT-Admin5	1		1																1	3
4	LT-Teach2																				
4	LT-Teach5																				
4	LT-Teach7																				
4	SV-Admin2																				
3	LT-Admin3																				
3	LT-Admin4																				
3	SV-Care																				
2	CA-Teach2																				
2	CA-Teach7																				
2	LT-Teach1																				
2	SV-Admin1																				
2	SV-Teach1																				
1	LT-Care																				
0	CA-Admin2																				
0	LT-Admin1		1	1						1										1	4
0	LT-Teach4																				
	Total	5	4	4	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	8	28

Table S9 *Q9 Subthemes by Sample Participant*

		Common subthemes																		
Stage	Participant	action	responsibility	independence	leadership	interconnections	motivation	thinking	time	values	citizen	consequences	one person	balance	choices	imperfect	patience	personal	topophilia	Total
6	CA-Coord	1	1	1				1					1							5
6	LT-Coord		1		1			1			1									4
6	LT-Teach6	1	1				1													3
5	CA-Admin1																			
5	CA-Teach1																			
5	CA-Teach3																			
5	CA-Teach5				1	1			1	1		1								5
5	CA-Teach6																			
5	LT-Admin2	1		1			1													3
5	LT-Teach3																			
5	SV-Coord			1		1			1	1										4
5	SV-Teach2																			
4	CA-Teach4																			
4	LT-Admin5																			
4	LT-Teach2																			
4	LT-Teach5																			
4	LT-Teach7																			
4	SV-Admin2																			
3	LT-Admin3																			
3	LT-Admin4																			
3	SV-Care																			
2	CA-Teach2	1	1		1															3
2	CA-Teach7																			
2	LT-Teach1																			
2	SV-Admin1																			
2	SV-Teach1																			
1	LT-Care																			
0	CA-Admin2																			
0	LT-Admin1																			
0	LT-Teach4																			
Total		4	4	3	3	2	2	2	2	2	1	1	1	0	0	0	0	0	0	27

Table S10 *Q10 Subthemes by Sample Participant*

		Common subthemes																	Particular subthemes		
Stage	Participant	action	responsibility	imperfect	interconnections	leadership	motivation	one person	thinking	balance	choices	citizen	consequences	independence	patience	personal	time	topophilia	values	integration	Total
6	CA-Coord	1	1		1				1											1	5
6	LT-Coord	1		1																1	3
6	LT-Teach6	1	1																	1	3
5	CA-Admin1																				
5	CA-Teach1																				
5	CA-Teach3																				
5	CA-Teach5																				
5	CA-Teach6	1				1		1												1	4
5	LT-Admin2																				
5	LT-Teach3																				
5	SV-Coord																				
5	SV-Teach2	1	1				1													1	4
4	CA-Teach4																				
4	LT-Admin5																				
4	LT-Teach2																				
4	LT-Teach5																				
4	LT-Teach7																				
4	SV-Admin2																				
3	LT-Admin3																				
3	LT-Admin4																				
3	SV-Care																				
2	CA-Teach2																				
2	CA-Teach7																				
2	LT-Teach1																				
2	SV-Admin1																				
2	SV-Teach1																				
1	LT-Care																				
0	CA-Admin2																				
0	LT-Admin1																				
0	LT-Teach4																				
	Total	5	3	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	5	19

Appendix T: Combined Subthemes Data Tables

Table T1 *Interpretation (Q1) Subthemes by Sample Participant*

Stage	Participant	ACTION^a	choices^b	TIME	balance	citizen	interconnections	leadership	responsibility	thinking	<i>three ESD spheres^c</i>	<i>appropriate scale of action</i>	<i>real life</i>	consequences	imperfect	independence	<i>daily activities</i>	patience	motivation ^d	one person	personal	topophilia	values	Total
6	CA-Coord ^e	1	1				1				1	1			1									6
6	LT-Coord																							
6	LT-Teach6	1	1	1				1			1					1	1	1						8
5	CA-Admin1																							
5	CA-Teach1																							
5	CA-Teach3	1	1				1				1		1	1			1							7
5	CA-Teach5																							
5	CA-Teach6	1	1	1					1	1														5
5	LT-Admin2			1			1	1	1				1											5
5	LT-Teach3	1	1		1																			3
5	SV-Coord	1	1							1														3
5	SV-Teach2																							
4	CA-Teach4					1	1		1			1												4
4	LT-Admin5																							
4	LT-Teach2																							
4	LT-Teach5		1		1	1					1		1											5
4	LT-Teach7																							
4	SV-Admin2								1				1			1								3
3	LT-Admin3																							
3	LT-Admin4																							
3	SV-Care																							
2	CA-Teach2																							
2	CA-Teach7																							
2	LT-Teach1																							
2	SV-Admin1																							
2	SV-Teach1																							
1	LT-Care																							
0	CA-Admin2																							
0	LT-Admin1																							
0	LT-Teach4	1	1			1							1											4
	Total	7	6	4	3	3	3	3	3	3	3	3	3	2	2	2	2	1	0	0	0	0	0	53

Note. ^a PRIMARY, secondary and tertiary overall subthemes backgrounded in pink;

^b Key interpretation subtheme backgrounded in blue;

^c Particular subthemes (arising from one question only) in *italics*;

^d Subthemes *not* in bold: did not appear in *sample* participants' responses;

^e Sampled participants backgrounded in yellow.

Table T2 *Connection (Q2–5) Subthemes by Sample Participant*

Stage	Participant	TIME ^a	ACTION	topophilia ^b	personal	choices	interconnections	leadership	multiple impetus ^c	thinking	balance	citizen	responsibility	values	consequences	change (nature of)	examples (concrete)	independence	motivation	one person	imperfect	patience	Total
6	CA-Coord ^d			1		1	1	1			1				1								6
6	LT-Coord	1	1											1						1			4
6	LT-Teach6																						
5	CA-Admin1	2	3				1							1		1			1				9
5	CA-Teach1	1		1	1		1		1														5
5	CA-Teach3	1			1	1			1		1	1			1								7
5	CA-Teach5	2			1	1			1	2			1		1	1		1		1	1	1	14
5	CA-Teach6		1																1				2
5	LT-Admin2	1		1																			2
5	LT-Teach3																						
5	SV-Coord		1			1				1	1						1	1					6
5	SV-Teach2	1				1					1						1			1			5
4	CA-Teach4	1		1								1											3
4	LT-Admin5	1	1						1			1		1									5
4	LT-Teach2	1	1		1	1		2		2							1	1					10
4	LT-Teach5	1								1				1					1				4
4	LT-Teach7	2		1			1	1					1			1							7
4	SV-Admin2	1			1	1			1														4
3	LT-Admin3	2	1	1								1	1										6
3	LT-Admin4		1										1										2
3	SV-Care	1	1	1								1	1	1									6
2	CA-Teach2																						
2	CA-Teach7		1	1	1		1																4
2	LT-Teach1	1	1		1				1														4
2	SV-Admin1		1	1			1								1								4
2	SV-Teach1	1	1		1																		3
1	LT-Care																						
0	CA-Admin2																						
0	LT-Admin1	1	1				1	1	1		1												6
0	LT-Teach4		1	1				2															4
Total		22	17	10	8	7	7	7	7	6	5	5	5	5	4	3	3	3	3	3	1	1	132

Note. ^a PRIMARY, secondary and tertiary overall subthemes backgrounded in pink;

^b Key connection subthemes backgrounded in yellow;

^c Particular subthemes (arising from one question only) in *italics*;

^d Sampled participants backgrounded in yellow.

Table T3 *Engagement (Q6–10) Subthemes by Sample Participant*

Stage	Participant	ACTION^a	responsibility	TIME	independence^b	motivation^b	leadership	<i>multiple barriers/drivers^c</i>	thinking	one person	<i>environmental literacy</i>	<i>integration</i>	<i>interconnections</i>	<i>citizen</i>	<i>values</i>	<i>consequences</i>	imperfect	<i>balance^d</i>	<i>choices</i>	<i>patience</i>	<i>personal</i>	<i>topophilia</i>	Total
6	CA-Coord ^e	2	2		1				2	1		1	1										10
6	LT-Coord	3	3			1	1		1		1	1		2			1						14
6	LT-Teach6	2	3	1	1	3	1	1	1			1	1										15
5	CA-Admin1	1	1	1		1		1		2	1												8
5	CA-Teach1	2	1	2		1		1		1	1												9
5	CA-Teach3	1	1	2			1	1															6
5	CA-Teach5			1			1						1		1	1							5
5	CA-Teach6	1					1			1		1											4
5	LT-Admin2	1		1	1	1					1			1									6
5	LT-Teach3	2	1		2				1	1							1						8
5	SV-Coord	1		1	2						1		1		1								7
5	SV-Teach2	1	2		2	1	2	1	1			1											11
4	CA-Teach4			1				1															2
4	LT-Admin5		1	1				1															3
4	LT-Teach2																						
4	LT-Teach5	1			1				1														3
4	LT-Teach7																						
4	SV-Admin2	1	1			1																	3
3	LT-Admin3																						
3	LT-Admin4																						
3	SV-Care																						
2	CA-Teach2	1	1				1																3
2	CA-Teach7																						
2	LT-Teach1																						
2	SV-Admin1																						
2	SV-Teach1																						
1	LT-Care																						
0	CA-Admin2	1		1	1		1																4
0	LT-Admin1	1	2			2		1							1								7
0	LT-Teach4																						
Total		22	19	12	11	11	9	8	7	6	5	5	4	3	3	2	1	0	0	0	0	0	128

Note. ^a PRIMARY, secondary and tertiary overall subthemes backgrounded in pink;

^b Key engagement subthemes backgrounded in green;

^c Particular subthemes (arising from one question only) in *italics*;

^d Subthemes *not* in bold: did not appear in *sample* participants' responses;

^e Sampled participants backgrounded in yellow.

Table T4 *Subthemes by Sample Participant Across Q1-10*

Stage	Participant	ACTION ^a	TIME	responsibility	leadership	independence	thinking	motivation ^b	interconnections	choices ^b	citizen	topophilia ^b	one person	balance	consequences	personal	values	multiple barriers/drivers ^c	multiple impetus	environmental literacy	integration	imperfect	change (nature of)	examples (concrete)	three ESD spheres	appropriate scale of action	real life	daily activities	patience	Total
	Total	46	38	28	20	16	16	14	14	13	11	10	9	8	8	8	8	8	7	5	5	4	3	3	3	3	3	2	2	315
6	CA-Coord ^d	3	1	2	2	1	2		2	1		1	1	1	1					1	1			1	1					22
6	LT-Coord	4	1	3	1		1	1			2		1				1			1	1	1								18
6	LT-Teach6	3	2	3	2	2	1	3	1					1				1			1				1			1	1	23
5	CA-Admin1	4	3	1				2	1				2				1	1		1			1							17
5	CA-Teach1	2	3	1				1	1			1	1			1		1	1	1										14
5	CA-Teach3	2	3	1	1				1	2	1			1	2	1		1	1			1				1		1		20
5	CA-Teach5		3	1	1	1	2		1	1			1		2	1	1		1			1	1						1	19
5	CA-Teach6	3	1	1	1		1	1		1			1							1										11
5	LT-Admin2	1	3	1	1	1		1	1		1	1							1							1				13
5	LT-Teach3	3		2	1	2	1			1			1	1	1															13
5	SV-Coord	3	1			3	2		1	2				1			1			1				1						16
5	SV-Teach2	1	1	2	2	2	1	1		1			1	1				1			1			1						16
4	CA-Teach4		2	1					1		2	1						1								1				9
4	LT-Admin5	1	2	1							1						1	1	1											8
4	LT-Teach2	1	1		2	1	2			1						1								1						10
4	LT-Teach5	1	1			1	2	1		1	1			1	1		1								1					12
4	LT-Teach7		2	1	1				1			1											1							7
4	SV-Admin2	1	1	1		1	1	1		1						1			1								1			10
3	LT-Admin3	1	2	1							1	1																		6
3	LT-Admin4	1		1																										2
3	SV-Care	1	1	1							1	1					1													6
2	CA-Teach2	1		1	1																									3
2	CA-Teach7	1							1			1				1														4
2	LT-Teach1	1	1													1			1											4
2	SV-Admin1	1							1			1			1															4
2	SV-Teach1	1	1													1														3
1	LT-Care																													
0	CA-Admin2	1	1		1	1																								4
0	LT-Admin1	2	1	2	1			2	1					1			1	1	1											13
0	LT-Teach4	2			2					1	1	1															1			8
	Total	46	38	28	20	16	16	14	14	13	11	10	9	8	8	8	8	8	7	5	5	4	3	3	3	3	3	2	2	315

Note. ^a PRIMARY, secondary and tertiary overall subthemes backgrounded in pink;

^b Key interpretation, connection, engagement subthemes backgrounded in blue, yellow, green;

^c Particular subthemes (arising from one question only) in *italics*;

^d Sampled participants backgrounded in yellow\.

Appendix U: Selection of Responses for Coding

Table U1 *Selection Analyzed by Stage*

Stage	Participant	School	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Σ avail T	Σ coded T	% coded T	av # Thick for stage	50%	av % coded T for stage
6	CA-Coord* ^d	—	T	T	T	T	T	T	T	T	T	T	10	5	50.0	9.7	5	51.9
6	LT-Coord*	—	T	T	T	T	T	T	T	T	T	T	10	5	50.0			
6	LT-Teach6*	LT-4	T	T	T		T	T	T	T	T	T	9	5	55.6			
5	CA-Admin1*	CA-1	T	T	T	T	T	T	T	T	τ	τ	8	5	62.5	7.6	4	53.3
5	CA-Teach1*	CA-1	T	T	T	T	T	T	T	T	T	τ	9	4	44.4			
5	CA-Teach3*	CA-2	T	T	T	T		τ	T	T	T	τ	7	5	71.4			
5	CA-Teach5*	CA-3	T	T	τ		T		T	T	T	τ	6	3	50.0			
5	CA-Teach6*	CA-3	T	τ	τ	T	T	τ	τ	T	T	T	6	3	50.0			
5	LT-Admin2*	LT-2	T	T	T	T	T	T	T	T	T	τ	9	4	44.4			
5	LT-Teach3	LT-2	T	T	T	T	T	T	T		T	τ	8	3	37.5			
5	SV-Coord*	—	T	τ	T	T	T	T	τ	T	T		7	4	57.1			
5	SV-Teach2*	SV-2	T	T	T	T	T	τ	T	T	τ	T	8	5	62.5			
4	CA-Teach4*	CA-2	T	T	T	T		τ	τ	T	T	τ	6	3	50.0	5.7	3	47.1
4	LT-Admin5	LT-4	T	T	T	T	T	τ	T	T	τ	τ	7	3	42.9			
4	LT-Teach2*	LT-1	T	T		T	T	T	τ		τ	τ	5	2	40.0			
4	LT-Teach5*	LT-3	T	T	T	τ	T	τ	T	τ	τ	τ	5	3	60.0			
4	LT-Teach7*	LT-4	T	T	T	T	T	τ	τ	τ		τ	5	2	40.0			
4	SV-Admin2*	SV-2	T	T	T	T		τ	T	T	τ	τ	6	3	50.0			
3	LT-Admin3	LT-3			T	T		τ	T		T	τ	4	2	50.0	3.3	2	58.3
3	LT-Admin4	LT-3	τ	τ	T	T		τ	τ		T	T	4	1	25.0			
3	SV-Care*	SV-1	τ	τ	T	T		τ		τ			2	2	100.0			
2	CA-Teach2	CA-1	τ	τ		τ	τ	T	τ		T	τ	2	1	50.0	2.0	1	63.3
2	CA-Teach7*	CA-4	τ	T	T	τ	τ	τ	T	τ		τ	3	1	33.3			
2	LT-Teach1	LT-1	τ	T		τ	τ	τ	T	T	τ		3	1	33.3			
2	SV-Admin1	SV-1	τ	τ	T	τ		τ	τ	τ	τ	τ	1	1	100.0			
2	SV-Teach1	SV-1	τ	T		τ		τ	τ	τ	τ	τ	1	1	100.0			
1	LT-Care	LT-1	τ	τ		τ	τ	τ	τ		τ	τ	0	0	0.0	0.0		0
0	CA-Admin2	CA-4							T	T			2	1	50.0			66.7
0	LT-Admin1*	LT-1	T	T					T	T			4	3	75.0			
0	LT-Teach4*	LT-2	T	T	T	T							4	3	75.0			

Total T resp. ^a	18	19	20	18	15	10	16	15	14	6	151	77
coded T resp. ^a	10	8	10	9	7	6	8	7	7	5		
% staged coded T resp. ^a	55.6	42.1	50.0	50.0	46.7	60.0	50.0	46.7	50.0	83.3		

^a staged participants only

Note. T represents an uncoded Thick response;

 T a coded Thick response;

 T a coded Thick response, used to illustrate vertical analysis (Ch. 6);

 τ a coded *Thin* response, used to illustrate vertical analysis (Ch. 6);

 LT-Teach3 a participant used to illustrate horizontal analysis (Ch. 7);

 CA-Teach3* a participant used to illustrate views (Ch. 8).

(74)

(38) \ \ 151
(39) / /

(31)

(16)

(20)

Table U2 *Selection Analyzed by Nation*

Stage	Participant	School	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Σ avail T	Σ coded T	%coded T	av # Thick for nation	50%	av % coded T for nation
6	CA-Coord*	—	T	T	T	T	T	T	T	T	T	T	10	5	50.0	5.9	3	52.0
5	CA-Admin1*	CA-1	T	T	T	T	T	T	T	T	τ	τ	8	5	62.5			
0	CA-Admin2	CA-4							T	T			2	1	50.0			
5	CA-Teach1*	CA-1	T	T	T	T	T	T	T	T	T	τ	9	4	44.4			
2	CA-Teach2	CA-1	τ	τ		τ	τ	T	τ		T	τ	2	1	50.0			
5	CA-Teach3*	CA-2	T	T	T	T		τ	T	T	T	τ	7	5	71.4			
4	CA-Teach4	CA-2	T	T	T	T		τ	τ	T	T	τ	6	3	50.0			
5	CA-Teach5*	CA-3	T	T	τ		T		T	T	T	τ	6	3	50.0			
5	CA-Teach6*	CA-3	T	τ	τ	T	T	τ	τ	T	T	T	6	3	50.0			
2	CA-Teach7*	CA-4	τ	T	T	τ	τ	τ	T	τ		τ	3	1	33.3			
6	LT-Coord	—	T	T	T	T	T	T	T	T	T	T	10	5	50.0	5.5	3	48.1
0	LT-Admin1*	LT-1	T	T					T	T			4	3	75.0			
5	LT-Admin2	LT-2	T	T	T	T	T	T	T	T	T	τ	9	4	44.4			
3	LT-Admin3	LT-3			T	T		τ	T		T	τ	4	2	50.0			
3	LT-Admin4	LT-3	τ	τ	T	T		τ	τ		T	T	4	1	25.0			
4	LT-Admin5	LT-5	T	T	T	T	T	τ	T	T	τ	τ	7	3	42.9			
2	LT-Teach1	LT-1	τ	T		τ	τ	τ	T	T	τ		3	1	33.3			
4	LT-Teach2*	LT-1	T	T		T	T	T	τ		τ	τ	5	2	40.0			
5	LT-Teach3	LT-2	T	T	T	T	T	T	T		T	τ	8	3	37.5			
0	LT-Teach4*	LT-2	T	T	T	T							4	3	75.0			
4	LT-Teach5*	LT-3	T	T	T	τ	T	τ	T	τ	τ	τ	5	3	60.0			
6	LT-Teach6	LT-4	T	T	T		T	T	T	T	T	T	9	5	55.6			
4	LT-Teach7*	LT-4	T	T	T	T	T	τ	τ	τ		τ	5	2	40.0			
1	LT-Care	LT-1	τ	τ		τ	τ	τ	τ		τ	τ	0	0	0.0			
5	SV-Coord*	—	T	τ	T	T	T	T	τ	T	T		7	4	57.1	4.2	2	64.0
2	SV-Admin1	SV-1	τ	τ	T	τ		τ	τ	τ	τ	τ	1	1	100.0			
4	SV-Admin2*	SV-2	T	T	T	T		τ	T	T	τ	τ	6	3	50.0			
2	SV-Teach1	SV-1	τ	T		τ		τ	τ	τ	τ	τ	1	1	100.0			
5	SV-Teach2*	SV-2	T	T	T	T	T	τ	T	T	τ	T	8	5	62.5			
3	SV-Care*	SV-1	τ	τ	T	T		τ		τ			2	2	100.0			

53.7 ave. % coded T
(by participant)*

Total T resp. ^a	20	21	21	19	15	10	18	17	14	6	161	84
coded T resp. ^a	11	9	11	10	7	6	10	8	7	5		
% coded T resp. ^a	55.6	42.1	50.0	50.0	46.7	60.0	50.0	46.7	50.0	83.3		

52.2 ave. % coded T
(overall)*

^a staged + unstaged participants

54.5 ave. % coded T
(by Question)*

Note. T represents an uncoded Thick response;

T a coded Thick response;

T a coded Thick response, used to illustrate vertical analysis (Ch. 6);

τ a coded *Thin* response, used to illustrate vertical analysis (Ch. 6);

LT-Teach3 a participant used to illustrate horizontal analysis (Ch. 7);

CA-Teach3* a participant used to illustrate views (Ch. 8).

$$\begin{array}{rcl}
 (77) & & \\
 (40) & \setminus & 161 \\
 (44) & / & 84 \\
 (31) & & \\
 (16) & & \\
 (20) & &
 \end{array}$$

Appendix V: Vertical Analysis Data for Response Styles

Question	Stage	Participant	ACTION ^a	TIME	responsibility	leadership	independence	thinking	motivation ^b	interconnections	choices ^b	citizen	topophilia ^b	one person	balance	consequences	personal	values	multiple barriers/drivers ^c	multiple impetus	environmental literacy	integration	imperfect	change (nature of)	examples (concrete)	three ESD spheres	appropriate scale of action	real life	daily activities	patience	Total
1	6	CA-Coord ^d	1	1		1																	1			1	1				6
	6	LT-Teach6	1	1		1	1								1											1			1	1	8
	5	CA-Teach3	1							1	1					1							1				1		1		7
	0	LT-Teach4	1								1	1																1			4
2	5	CA-Teach1		1						1			1				1			1											5
	5	CA-Teach5		1	1		1	1			1			1		1	1			1											9
	2	LT-Teach1	1	1													1			1											4
	2	SV-Teach1	1	1													1														3
	0	LT-Admin1	1	1		1				1					1					1											6
3	5	CA-Admin1	1	1						1								1													4
	4	CA-Teach4		1								1	1																		3
	2	CA-Teach7	1							1			1				1														4
	2	SV-Admin1	1							1			1			1															4
	0	LT-Teach4				1							1																		2
4	5	CA-Admin1	1						1																						2
	4	LT-Teach2		1		1		1																							3
	3	LT-Admin3	1	1	1																										3
	3	LT-Admin4	1		1																										2
	3	SV-Care	1		1																										2
5	5	CA-Teach5		1				1															1	1						1	5
	5	SV-Teach2											1	1											1						3
	4	LT-Teach5		1				1	1								1														4
	4	LT-Teach7		1	1	1																	1								4
6	6	LT-Coord	1		1							1								1											4
	5	LT-Admin2		1								1								1											3
	5	LT-Teach3	1		1		1																								3
	5	SV-Coord	1				1													1											3
7	6	LT-Coord	1		1				1																						3
	6	LT-Teach6				1		1	1																						3
	5	CA-Teach1	1	1	1									1																	4
	4	SV-Admin2	1		1				1																						3
	0	CA-Admin2	1	1		1	1																								4
	0	LT-Admin1	1		1				1																						3
8	5	CA-Teach3		1															1												2
	5	SV-Teach2			1	1	1												1												4
	4	LT-Admin5		1	1														1												3

Question	Stage	Participant	ACTION	TIME	responsibility	leadership	independence	thinking	motivation	interconnections	choices	citizen	topophilia	one person	balance	consequences	personal	values	multiple barriers/drivers*	multiple impetus*	environmental literacy	integration	imperfect	change (nature of)	examples (concrete)	three ESD spheres	appropriate scale of action	real life	daily activities	patience	Total
9	6	CA-Coord	1		1		1	1						1																	5
	5	CA-Teach5		1		1				1						1	1														5
	5	LT-Admin2	1				1		1																						3
	2	CA-Teach2	1		1	1																									3
10	6	CA-Coord	1		1			1		1												1									5
	6	LT-Coord	1																			1	1								3
	5	CA-Teach6	1			1								1								1									4
	5	SV-Teach2	1		1				1													1									4
Total for analysis ^e			29	20	17	12	8	7	8	8	3	4	5	5	3	4	5	3	3	4	3	4	4	2	1	2	2	1	2	2	171
Overall total ^f			46	38	28	20	16	16	14	14	13	11	10	9	8	8	8	8	8	7	5	5	4	3	3	3	3	3	2	2	315

Note. ^a PRIMARY, secondary and tertiary overall subthemes backgrounded in pink;

^b Key interpretation, connection, engagement subthemes backgrounded in blue, yellow, green;

^c Particular subthemes (arising from one question only) in *italics*;

^d Sampled participants backgrounded in yellow;

^e Total for analysis (= grid totals for each subtheme) indicate how many participants mentioned this subtheme across all their responses, but without replication

^f Overall total (from Table T4) includes replications of subthemes

Appendix W: Horizontal Analysis for 16 Portrait Participants

Stage	Participant	action	thinking	<u>time^a</u>	leadership	topophilia	choices ^a	<u>responsibility^a</u>	independence	motivation	one person	Total	<i>With Replications</i>
6	CA-Coord ^b	3	2	1	2	1	1	2	1		1	9	14
6	LT-Coord	4	1	1	1			3		1	1	7	12
6	LT-Teach6	3	1	2	2			3	2	3		7	16
5	CA-Admin1	4		3				1		2	2	5	12
5	CA-Teach1	2		3		1		1		1	1	6	9
5	LT-Admin2	1		3	1	1		1	1	1		7	9
5	LT-Teach3	3	1				1	1	2		1	6	9
5	SV-Teach2	1	1	1	2		1	2	2	1	1	9	12
4	CA-Teach4			2		1		1				3	4
4	LT-Teach5	1	2	1			1		1	1		6	7
4	SV-Admin2	1	1	1			1	1	1	1		7	7
3	LT-Admin3	1		1		1		1				4	4
3	SV-Care	1		1		1		1				4	4
2	CA-Teach7	1				1						2	2
2	LT-Teach1	1		1								2	2
2	SV-Admin1	1				1						2	2
	Total	28	9	21	8	8	5	18	10	11	7	86	125

Note. ^a Primary connection, interpretation, engagement subthemes backgrounded in yellow, blue, green;

^b Portrait participants backgrounded in yellow.

Appendix X: Analysis for Views

Subthemes:		INT. ^b	CONNECTION ^b				ENGAGEMENT ^b					Total	With Rep- lications
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
> Common													
ACTION ^a		1	1	1	1	1	1	1	1	1	1	10	46
TIME		1	1	1	1	1	1	1	1	1		9	38
responsibi	lity	1	1		1	1	1 ^c	1	1	1	1	9	28
leadership		1	1	1	1	1		1	1	1	1	9	20
independe	nce	1	1			1	1	1	1	1		7	16
thinking		1	1		1	1		1		1	1	7	16
one person ^b			1			1	1	1	1	1	1	7	9
motivation					1	1		1	1	1	1	6	14
interconnections		1	1	1					1	1	1	6	14
consequences		1	1	1	1			1		1		6	8
citizen		1	1	1			1			1		5	11
values			1	1		1			1	1		5	8
balance		1	1		1	1						4	8
choices ^b		1 ^c	1		1	1						4	13
imperfect		1				1					1	3	4
personal			1	1		1						3	8
patience		1				1						2	2
topophilia ^b			1 ^c	1								2	10
> Particular													
three ESD spheres		1										1	3
appropriate scale		1										1	3
real life		1										1	3
daily activities		1										1	2
multiple impetus			1									1	7
change (nature of)						1						1	3
examples (concrete)						1						1	3
environmental literacy							1					1	5
multiple barriers/drivers									1			1	8
integration											1	1	5
Total		17	16	9	9	16	7	9	10	12	9	114	315

Note. ^a PRIMARY, secondary and tertiary overall subthemes backgrounded in pink;

^b Interpretation, connection, engagement strands and primary subthemes in blue, yellow, green;

^c Bold entries represent key indicator subthemes for each of the three strands.

Appendix Y: Participant and Stage Trend Analysis

Participant	Stage	Coded Thick responses ^a	Subthemes by:		Averages for stage		
			Replication ^b	Occurrence ^c	CTR ^a	SbR ^b	SbO ^c
CA-Coord	6	10	22	15	9.7	21.0	13.7
LT-Coord	6	10	18	12			
LT-Teach6	6	9	23	14			
CA-Admin1	5	8	17	10	7.6	15.0	11.3
CA-Teach1	5	9	14	11			
CA-Teach3	5	7	20	15			
CA-Teach5	5	6	19	15			
CA-Teach6	5	6	11	9			
LT-Admin2	5	9	13	11			
LT-Teach3	5	8	11	8			
SV-Coord	5	7	16	10			
SV-Teach2	5	8	14	13			
CA-Teach4	4	6	9	7	5.7	9.3	8.2
LT-Admin5	4	7	8	7			
LT-Teach2	4	5	10	8			
LT-Teach5	4	5	12	11			
LT-Teach7	4	5	7	6			
SV-Admin2	4	6	10	10			
LT-Admin3	3	4	6	5	3.3	4.7	4.3
LT-Admin4	3	4	2	2			
SV-Care	3	2	6	6			
CA-Teach2	2	2	3	3	2.0	3.6	3.6
CA-Teach7	2	3	4	4			
LT-Teach1	2	3	4	4			
SV-Admin1	2	1	4	4			
SV-Teach1	2	1	3	3			
		Figure 24 (Participants)			Figure 25 (Stages)		
Not graphed:							
LT-Care	1	0	0	0	0.0	0.0	0.0
CA-Admin2	0	2	4	4	3.3	8.3	6.7
LT-Admin1	0	4	13	10			
LT-Teach4	0	4	8	6			

Note. ^a These are the Thick responses that were coded for subthemes;

^b This column counts (averages) each subtheme as many times as the participant used it;

^c This column counts (averages) each subtheme used by a participant, but only once (even if the participant used it multiple times).

Appendix Z: Trends in Word Maps for Horizontal Analysis

Trend	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
By participant range within stage					
Number of ellipses	1	2	3	3–5	5
Number of different subthemes	4	6	7–11	8–13	12–16
Total number of subthemes, including repetitions	4	5–6	9–12	11–17	18–22
Number of different subthemes repeated by each participant	0	0–1	0–2	1–4	3–6
Number of subthemes mentioned across all three strands	n/a	n/a	0	0–2	2–4
Number of subthemes from cohort of numerically higher stage subthemes	0	0	0–3	1–4	2–4
By stage overall					
Number of different repeated subthemes in word maps contributing to views	0	1	2	7	7
Number of subthemes shared by all stage participants in word maps and excerpts	2	6	3	3	11
Number of shared subthemes contributing to views in word maps and excerpts	1	4	3	3	8