

A Critical Policy Analysis of Environmental and Sustainability Education in Canada

A Thesis Submitted to the College of
Graduate and Postdoctoral Studies
In Partial Fulfillment of the Requirements
For the Degree of Doctor of Philosophy
In the School of Environment and Sustainability
University of Saskatchewan
Saskatoon, Canada

By Kathleen Aikens

© Copyright Kathleen Rose Aikens, July 2019. All rights reserved

Permission to Use

In presenting this thesis/dissertation in partial fulfillment of the requirements for a Postgraduate degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis/dissertation in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor, Dr. Marcia McKenzie, or, in her absence, by the Executive Director of the School of Environment and Sustainability at the University of Saskatchewan. It is understood that any copying or publication or use of this thesis/dissertation or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis/dissertation.

Requests for permission to copy or to make other use of material in this thesis in whole or part should be addressed to:

Executive Director
School of Environment and Sustainability
University of Saskatchewan
Room 323, Kirk Hall
117 Science Place
Saskatoon, SK S7N 5C8, Canada

Or
Dean
College of Graduate and Postdoctoral Studies
University of Saskatchewan
116 Thorvaldson Building, 110 Science Place
Saskatoon, Saskatchewan S7N 5C9
Canada

Abstract

Despite calls to re-orient school systems toward sustainability, there has been uneven progress toward mainstreaming of Environmental and Sustainability Education (ESE) into Kindergarten-Grade 12 (K-12) schooling. This doctoral dissertation examines the state of ESE policy research internationally, as well as policy and practice in ESE in the Canadian K-12 public schooling system. The research falls under the umbrella of critical comparative policy studies, with theoretical and methodological approaches derived from both policy mobilities and policy enactment research. Each manuscript chapter is animated by a different analytic framework; in chapter 2, we use a systematic review to critically assess the status of policy research within the international field of ESE; in chapter 3, we employ a policy mobilities framework to textual analysis of provincial ESE policies; and in chapter 4, I focus on policy enactment in four schools within the province of Manitoba.

Findings in Chapter 2, a systematic review of policy research, provide impetus for the subsequent two manuscripts: the empirical foundation of policy research in ESE was found to be limited; there existed no comparative studies of ESE policy within Canada; and most studies focused on classroom implementation of curriculum. Chapter 3 examined the mobilization of international ESE policy across six provincial and territorial ministries of education in Canada. We documented three distinct policy clusters in provincial ESE policy, related to sustainable development, environmental education, and Indigenous education, each emphasizing different foci and different relationships to a global ESD assemblage.

Chapter 4 used comparative case study analysis to examine ESD policy enactment in four schools within the province of Manitoba. I focused on the relationship between actors and their material contexts, including school buildings and school grounds, to explore how particular ESD policy enactments are produced in specific places. This chapter examined policy enactment in relation to a provincial eco-certification program, which functioned as a policy apparatus through an encouragement and rewards model. Chapter 4 highlights the role of “relational” leadership, which is distributed amongst different school-based actors and reliant on material infrastructures.

Overall, this dissertation provides critical foundational research with respect to a) the status of ESE policy research internationally; and b) ESE policy mandates across Canadian provinces and their enactment trajectories.

Acknowledgments

This dissertation was written with gratitude, love, and a certain (necessary?) amount of frustration. It is an absolute pleasure and privilege to have been supported in this process by many lovely humans.

Firstly, to my advisor, Dr. Marcia McKenzie: your fierce intellect, meticulous scholarly work, and dedication to making an impact have shaped not only the quality of my dissertation and other academic works, but also who I am, as a scholar. The support you have offered me is above and beyond what I had ever imagined upon entering my doctoral program.

To my committee members, thank you for your brilliance, your insightful questions, your support, and your time investment into reading long, complex dissertation documents.

Nicola Chopin was a project manager extraordinaire, without whom SEPN and this dissertation research, would not exist. Your competency is unrivaled, your sarcasm one of my favorite office distractions.

This research was collaborative at every step, with many fellow researchers. Firstly, a thank you to my comrades with whom I shared meeting tables, hotel rooms, and emotional spaces of all kinds: Jada Koushik, Naomi Maina, Kristen Hargis, Jaylene Murray, Jen McRuer, Adam Young, Rachel Regier, Yvonne Vizina, Katherine Riley, Madeline Lawler, and Sandra Schneider. For the completion of research in Manitoba, I am particularly indebted to Kat, Sandra, and Madeline. Philip Vaughter and Andrew Bieler, you were postdocs extraordinaires, who indulged all of my queries with thoughtfulness. There are other SEPN researchers too numerous to name who did not directly support this dissertation, but who nevertheless contributed their time and brains to support many aspects of the collaborative research, and from whose shared wisdom I have directly benefited. A special mention here to Ranjan Datta, as part of the SERI group; you are one of the most generous and brilliant scholars I have ever met.

To all of the research participants who took part in this process, from ministry staff and divisional superintendents, to principals and teachers, to the hundreds of students. Thank you for sharing your time, your enthusiasm, and your wisdom with me. Thank you in particular to the

teachers and principals who clearly bring to their work creativity, respect for students, and deep commitment to building a better world through education.

Far beyond this dissertation, thank you to the students who are directly challenging the purpose of education in the face of impending climate disaster and striking from school, for climate action.

To my partner, Paul: I tried to warn you what you were getting yourself into, but I don't think you believed me. You have been my greatest emotional support throughout this process, listening to every rant and insecurity. The various facets of this research took me away from home for combined 12 weeks, and during this time, you were on solo household duty for first one, then two kids. I am eternally grateful for your love and support.

To Jesmond and Hugh: You are both the loves of my life, and the primary reasons I am trying to help build a more sustainable future. Jesmond, you have been along for this entire ride of a doctoral program and have been my most frequent companion on walks through the neighbourhood, bus rides to daycare and campus, and the once-a-year plane ride to Cape Breton. Your creativity, stubbornness, and empathy are your greatest gifts, and I have learned so much from being your parent. Hugh, you are currently a toddler whirlwind of affection and chaos. Your hugs, your silliness, and your enthusiastic affection for all living things has kept me going through the last 18 months.

To my parents: It was a gift to be raised by you. You are my role models in every sense of the term: you taught me to strive to be a moral person. Your emotional, intellectual, and overall "parental" support of the last 35 years has been everything to me. Thank you for rescuing me and providing nanny services in Fall 2018, so that I could actually complete this thesis.

To my brothers, Aaron and John: Honestly, I just feel sorry for the people who aren't your siblings, and sorrier for myself that we now live so far apart. You both got all the storytelling ability (not to mention the athletic skills) in the family; I miss your wit, intelligence, and love every day.

To every member of my in-law family, Lois, Laurie, Tammy, Evan, Beth, Chris, Avery, Hayley, and Ellie: This thesis would not have been written without your support, both the tangible parts like childcare and meals, and the intangible, emotional pieces. Lois and Laurie, you are superstar

in-laws, parents, and grandparents: I will never be able to thank you enough. Tammy, I survived some rough parts entirely because of you: you are one of the smartest people I have ever met.

A special thank you to my Newfie in-law Jillian: I adore you as much as my kids do AND you're an inspiring teacher and coach.

To the Aikens and Butler clans: how do I ever thank you for the love, the food (the "food olympics"), the "pop-in" visits, the childhood gifts and now gifts to my children, the camping and swimming, and the chaos of having 40-something people in a 1,000 square foot home?

To everyone in Leitches Creek and Frenchvale: you are my family too, and I have carried the sense of community I learned as a child throughout the last 13 years I have spent living away from home.

A final acknowledgement to my Saskatoon friends and fellow environmental community "strivers": you are all radical inspirations.

This doctoral journey was supported by a number of funding sources: A SSHRC research grant to M. McKenzie; the Saskatchewan Innovation and Opportunity Scholarship; the University of Saskatchewan Teacher Scholar Doctoral Fellowship; the Dr. Rui Feng Graduate Student Award; and travels awards from the School of Environment and Sustainability and the International Student and Study Abroad Centre. I would not have been able to complete this research without this financial support. Some of the financial support (SSHRC grant to M. McKenzie) enabled transcription of interview and focus group recordings and requires huge gratitude to the capable staff at the Social Science Research Laboratories at the University of Saskatchewan.

Land Acknowledgments

This dissertation was written primarily in misâskwatôminihk (Saskatoon), on Treaty 6 territory, and homeland of the Métis. While undertaking research in schools, I also visited Treaty 1 territory, which is home to the Anishnaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, as well as the Métis Nation.

I am a white settler who has lived in misâskwatôminihk for eight years. I also spend my time in Unama'ki (Cape Breton), which is Mi'kmaq territory with Wolastoquey and Passamaquoddy neighbours, and is where I grew up. The coastal, forested lands of Unama'ki have shaped my subsequent relationships to other lands.

In light of these specific territorial acknowledgments, what are my responsibilities in this dissertation? In general, I believe this involves being a good neighbour to both human and more-than-human beings who live on these lands. Given my position as a settler who has amassed wealth both directly and indirectly due to land-based dispossession and exploitation, I need to be able to answer to these responsibilities with humility.

In all my interactions, across multiple treaty territories (all unceded land), I have attempted to exercise care in my relationships. I have attempted to recognize, and work against, institutional and other systemic colonial barriers. I have not always done so well.

I am indebted to my mentors, colleagues, family, community leaders, and to every plant and animal I consumed while creating this work, whether recently or million-years deceased. Thank you, hiy hiy, Wela'lioq

Table of Contents

<i>Permission to Use</i>	<i>i</i>
<i>Abstract</i>	<i>ii</i>
<i>Acknowledgments</i>	<i>iii</i>
<i>Land Acknowledgments</i>	<i>vi</i>
<i>List of Tables</i>	<i>x</i>
<i>List of Figures</i>	<i>xi</i>
<i>List of Abbreviations</i>	<i>xiii</i>
CHAPTER 1: Introduction to policy research in environmental and sustainability education	1
Introduction	1
Theoretical Framework	3
Defining policy.	4
Environmental and sustainability education policy on the move.....	4
Policy enactment and material contexts.	7
Research Objectives	8
Methodology and Methods	9
Data collection.....	10
Data analysis.	14
Research Ethics	14
Thesis Structure	15
Transition	18
CHAPTER 2: Environmental and sustainability education policy research: a systematic review of methodological and thematic trends	19
Introduction	19
Methods	21
Findings	23
Temporal and geographic trends.....	23
Terminology.....	25

Research approach.....	26
Thematic coding.....	27
Research Gaps and Implications	40
<i>Transition.....</i>	45
<i>CHAPTER 3: The global ESD assemblage in Canadian context: ESD, EE, and Indigenous education across six provinces and territories.....</i>	46
Introduction	46
Policy assemblages, mobilities, and mutations.....	47
ESD as a global policy assemblage.....	48
Methods.....	49
Policy document collection.....	50
Policy analysis and identification of policy clusters.....	50
Findings.....	52
Sustainable development policy cluster.....	54
Environmental education policy cluster.....	58
Indigenous education policy cluster.....	61
Discussion: Implicated Policy Mobilities	65
Gaps and silences across the analysis: Some implications.....	66
Conclusions	68
<i>Transition.....</i>	70
<i>CHAPTER 4: A comparative case study analysis of ESD policy enactment in the Canadian province of Manitoba.....</i>	71
Introduction	71
Background	72
Policy enactment.....	72
Historical contexts of environmental education and ESD	74
Contexts of ESD policy development in Manitoba.....	75
Methods.....	77
Data collection.....	77
Data analysis.....	79

Findings	79
School 1: Leapfrogging past awareness.....	82
Sustaining transformation at School 4.....	86
Struggling to sustain.	90
Discussion: Refraction and the Role of Administrators	91
Implications and Conclusions	93
<i>CHAPTER 5: Assembling conclusions and contributions</i>	95
Synopsis	95
Research Dissemination and Impact	96
Research Contributions and Recommendations for Future Research	97
Research Challenges and Limitations	100
Limitations of the Canadian colonial context.	102
Conclusions	103
<i>References</i>	105
<i>Appendices</i>	127
Appendix A. Interview Protocol	127
Appendix B. Heat Diagram Application	134
Appendix C. Sidewalk Interview Protocol	135
Appendix D. Child Focus Group	137
Appendix E: Focus Group Protocol	140
Appendix F: Field Notes Protocol	145
Appendix G: Photo documentation Protocol	146
Appendix H: Document Collection Protocol	147
Appendix I: Student Consent Forms	149
Appendix J: Adult Consent Forms	151
Appendix K: Research Brief	153

List of Tables

Table 1.1 Summary of data collection across locations and participant types.....	p. 11
Table 2.1 Categorization of research approach.....	p. 22
Table 2.2 Categorization of literature review articles by research type.....	p. 26
Table 2.3 Content analysis themes and subthemes from literature review.....	p. 28
Table 4.1 Mean staff ratings across each sustainability domain, for each of the four schools.....	p. 81

List of Figures

- Figure 1.1 Conceptualizing the sites of K-12 field research (“site analyses”). The red triangle indicates the province of MB in relation to other provinces included in overall SEPN project research. (Figure from document “T2- SEPN Site Analysis Methods”).....p. 12
- Figure 2.1 Number of policy-related articles from 1974 to 2013. Note the spike in the late 1970s, late 1990s (post Agenda 21) and late 2000s-onwards (UN DESD).....p. 23
- Figure 2.2 Map of research on sustainability education policy included in this review. Shaded countries are represented by at least one publication. Regional totals for Africa, the Americas, Asia-Pacific and Europe are included with total number of countries represented, and in brackets, total number of studies based in those countries.p. 24
- Figure 2.3 The relative distribution of articles by country, with each bar representing the total number of publications per country. Countries on the left were the focus of a large proportion of the publications (as included in inset table)p. 25
- Figure 2.4 Tracking use of terminology in titles of reviewed articles from 1975 to 2013. The upper dotted line represents publications which included “environment” in the title; the solid line represents publications which included “sustainable development” in the title; the dashed line represents all publications which included “sustainable/sustainability” in the title.....p. 26
- Figure 2.5 Changes over three time periods in types of empirical policy research.....p. 27
- Figure 2.6 Proportion of articles referencing climate change across four time periods.....p. 29
- Figure 3.1. Representation of three ESE clusters across six provincial and territorial contexts, in relation to a global ESD assemblage.....p. 52
- Figure 3.2 Comparative analysis of three categorical components of ESE, across three policy clusters.....p. 53
- Figure 3.3. Word cloud of the most frequent terms used within the SD policy cluster.....p. 54
- Figure 3.4. Word cloud of the most frequent terms used within the environmental education policy cluster.....p. 59
- Figure 3.5. Word cloud of the most frequent terms used within the Indigenous education policy cluster.....p. 62
- Figure 4.1 Heat diagram application with example participant ratings provided.....p. 78
- Figure 4.2 Progress toward creation of a sustainable school, as assessed by staff at each of four schools.....p. 82

Figure 4.3 Evidence of the commitment to active transportation was visible throughout the school building and grounds.p. 84

Figure 4.4. Outdoor greenhouse at School 4.....p. 88

List of Abbreviations

AERA	American Educational Research Association
BC	British Columbia
CCE	Climate Change Education
CMEC	Council of Ministers of Education, Canada
DESD	Decade of Education for Sustainable Development
EE	Environmental Education
EECOM	Canadian Network for Environmental Education and Communication
EERA	European Education Research Association
EfS	Education for Sustainability
ESD	Education for Sustainable Development
ERIC	Education Resources Information Center
ESE	Environmental and Sustainability Education
IPCC	Intergovernmental Panel on Climate Change
IQ	Inuit Qaujimagajatuqangit
IUCN	International Union for the Conservation of Nature
K-12	Kindergarten-Grade 12
LEED	Leadership in Energy and Environmental Design
NCLB	No Child Left Behind
NEAP	National Environmental Action Plan
NGO	Non-governmental Organization
NWT	Northwest Territories
SD	Sustainable Development
SEPN	Sustainability and Education Policy Network
UK	United Kingdom
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
US	United States

CHAPTER 1: Introduction to policy research in environmental and sustainability education

Introduction

From the Tbilisi Declaration in 1978 to the recent Sustainable Development Goals (2015), international declarations have invoked environmental and sustainability education (ESE) as a solution to the sustainability crisis. Despite these calls to re-orient school systems toward sustainability, there has been uneven progress toward mainstreaming of ESE into Kindergarten-Grade 12 (K-12) schooling. Concurrently, the social and environmental concerns animating international agreements, such as the Rio Declaration (UNCED, 1992), the Kyoto Protocol (1997), and the Millennium Development Goals (UN, 2000), have burgeoned into social and ecological disasters (Rockström et al., 2009; Steffen et al., 2015). A recent special report from the Intergovernmental Panel on Climate Change outlines a short timeline for expansive change (Masson-Delmotte et al., 2018) and emphasizes the need for an integrated response to the climate crisis. This dissertation adopts the normative position that public education must be part of this integrated response and that educational research can support the transition to socio-ecological sustainability.

Within the field of ESE, critical policy research is empirically underdeveloped and disconnected from broader onto-epistemic trends in educational and social science research (Aikens, McKenzie, & Vaughter, 2016; Læssøe, Feinstein, & Blum, 2013; Stevenson, 2013). Læssøe and colleagues describe “an urgent need for more EE [environmental education]/ESD [Education for Sustainable Development]...policy research that not only focuses on policy discourses but also engages with the full range of the policy cycle” (Læssøe et al., 2013, p. 235). Within the Canadian context, coordinated analysis of both policy and practice is underdeveloped, owing in part to the challenge arising from decentralized, provincial control over education. Canada, and the province of Manitoba in particular, are regarded as leaders in Education for Sustainable Development (McKeown & Nolet, 2013); yet, documentation consists largely of self-reports from government or sustainability organizations which “tend to be uncritical catalogues that focus on successes and are silent about problems and failures” (Nazir et al., 2009, p. 27).

This doctoral thesis examines the state of ESE policy research internationally, and the relationship between policy and practice in ESE in the Canadian K-12 public schooling system. I undertook this research with the explicit goal of supporting better integration of ESE into policy and practice in Canadian education and worked with the Sustainability and Education Policy Network (SEPN) throughout all dissertation research. SEPN was formed in 2012 as a network of scholars and organizations, committed to advancing sustainability in education policy and practice through research excellence¹. This dissertation is part of a larger SEPN project addressing a research gap in comparative analysis of ESE policy and practice in Canadian education systems, both K-12 and post-secondary education.

With this dissertation, I have chosen to locate my research at the confluence of several distinct fields of scholarship, including policy mobilities (McKenzie, Bieler, & McNeil, 2015; Peck & Theodore, 2015), policy enactment (Bowe & Ball, with Gold, 1992; Ball, Maguire, & Braun, 2012), and environmental and sustainability education (Stevenson, Brody, Dillon, & Wals, 2013). It is important to note that other researchers are beginning draw insights from across these domains (e.g. Ball, 2016; Gulson et al., 2017; McKenzie et al., 2015; Stevenson, 2013). The decision to integrate across several research domains reflects a need for interdisciplinary thinking with respect to complicated or “wicked” problems (Brown, Deane, Harris, & Russell, 2005; Wiek, Withycombe, & Redman, 2011).

Public policy scholars have outlined characteristics of global climate change as a “super wicked problem” (Levin, Cashore, Bernstein, & Auld, 2012), including the following four features of the phenomenon:

- (1) Time is running out;
- (2) Those seeking solutions are also part of the problem;
- (3) Central authority is weak or non-existent;
- (4) Policies (and policymakers) irrationally discount the future (i.e., in the face of overwhelming evidence, fail to adequately account for climate change in policy.)²

¹ SEPN is funded by the Social Science and Humanities Research Council (SSHRC), with an goal of “undertaking policy research in international, national, and regional education systems to provide rigorous, comparative evidenced-based understandings of policy, and enable deeper responses to sustainability” (sepn.ca, n.d.). The network website (sepn.ca) provides a complete list of publications, reports, and databases created through all related research.

² There is also significant conflict between the short-term goals fostered by election cycles and the committed, sustained investment required for climate change mitigation and adaptation (Hale, 2010; Levin et al., 2012).

(Adapted from Levin et al. 2012)

Through its co-implication as a (partial) solution to climate change and the sustainability crisis, ESE could be considered a wicked problem. While central authorities with respect to educational policy and curriculum do exist, there is no overarching body with the authority to require inclusion of ESE into Kindergarten-Grade 12 schooling, either in Canada or internationally; current international ESE mandates are voluntary (weak authority). With respect to the fourth feature of “discounting the future,” national and subnational educational policies remain focused on literacy, numeracy, and performance on international assessments, such as the Programme for International Student Assessment (PISA) (Rizvi & Lingard, 2010; Meyer & Benavot, 2013). While basic literacy and numeracy support civic participation, educating for a sustainable future requires a broader re-thinking of the purposes of education, and re-alignment of the entire system towards greater sustainability. Several scholars have outlined concerns with instrumental forms of ESE (e.g., Jickling 1992; Jickling & Wals 2008; Sauvé, 1996), warning against “prescriptive constructions such as ‘education for sustainable development’ that reduce the conceptual space for self-determination, autonomy, and alternative ways of thinking” (Jickling & Wals, 2008, p. 4). ESE must enact a delicate balance: address the urgency of education for a sustainable future, yet avoid the temptation to rush into narrow, deterministic solutions and foreclose viable and just solutions to the sustainability crisis. This is precisely where research can play a critical role in supporting effective ESE policy and practice.

Overall, this dissertation undertakes a critical, comparative research approach to examining ESE policy. It provides a foundational, systematic analysis of the state of international policy research in ESE, then builds on this to examine ESE policies across Canadian provinces. Finally, it provides an in-depth, comparative case analysis of four schools’ enactment of ESE policy in the province of Manitoba.

Theoretical Framework

The theoretical framework of this dissertation is based on comparative policy research in education and urban geography (Ball et al, 2012; Peck & Theodore, 2015). The first section below provides an orientation to the term “policy” as it is conceptualized throughout the three manuscript chapters. The following sections outline contributions from policy mobilities and policy enactments research, including how these literatures have been engaged to date in educational research.

Defining policy. In a 1985 paper calling for a paradigm shift toward critical policy analysis, John Prunty complained that the word policy had “no standard usage” and was “riddled with ambiguity” (p. 133). He suggested adopting the definition of policy scientist David Easton, who described policy as “the authoritative allocation of values” (1953, cited in Prunty, 1985, p. 134). Straightforward definitions of policy as state-level, textual, or oral problem-solving directives still persist in public policy analysis (e.g., Sykes, Schneider, & Plank, 2009). However, since the uptake of policy research into a diverse array of fields (e.g., critical sociology, social anthropology, cultural geography), definitions of policy have diversified (Simons, Olssen, & Peters, 2009), including notions of policy as an assemblage of text, legislation, and strategies, as well as discursive processes (Ball, 1994). Lingard and Ozga (2007) provide an operational definition of education policy as that which “deals with all texts, apart from curricula, which seek to frame, constitute and change educational practices” (p. 2). In this dissertation I use a modified version of Lingard and Ozga’s definition which includes curricula as part of the ensemble of policy documents related to ESE.

With respect to policy processes, I conceptualize policy as a complex and iterative process, rather than a hierarchical chain of production proceeding through implementation. This understanding is informed by scholarship on education policy enactment (Braun, Maguire, & Ball, 2010; Ball et al. 2012), which investigates policy discourses, actors, and conditions. As implied by the term “enactment,” this body of research understands policy-in-action (i.e., on the ground, in schools) as a performance contingent on many factors including material conditions, professional cultures, and available resources (Braun et al. 2010; Ball et al. 2012). Combining insights from the policy enactment literature with policy mobilities research permits a nuanced understanding of the relationships amongst different levels of policy activity. It is particularly useful for understanding how international mandates are mobilized and adapted across national and subnational contexts.

Environmental and sustainability education policy on the move. “Mobilities” research emphasizes a shift from examination of the fixed and static to a focus on the circulation of people, objects, and ideas (Sheller & Urry, 2006; Urry, 2007). Mobility studies is a broad and “post-disciplinary” arena, uniting somewhat disparate lines of thinking through a focus on how things move (or do not move) through space (Urry, 2007). The mobilities paradigm seeks to disrupt and displace the idea of place/space as a fixed container for the unfolding of events. Like Massey’s global sense of place (1994, 2005), Sheller and Urry (2006) consider places as

“implicated within complex networks by which hosts, guests, buildings, objects, and machines are contingently brought together to produce certain performances in certain places at certain times” (p. 214).

Drawing on Simmel’s work on the circulation of currency, Urry (2007) argues that a mobilities approach goes beyond exploration of simple flows to the productive tension of “flux.” Flux considers the intersections of both mobilities and immobilities, recognizing that movement is both enabled and constrained by particular moorings (systems and infrastructure). In order to define central features of the field, Urry outlines five types³ of interdependent mobilities:

- “Corporeal travel” of humans for work, tourism, and migration;
- “Physical movement” of objects through consumption and gift-giving;
- “Imaginative travel” through images and video representation;
- “Virtual travel” as enabled through communications technology, often in real time;
- “Communicative travel” through emails, letters, mobile phones, etc.

As increasingly internationalized processes, policy development and enactment may involve any of the five mobilities outlined above. For example, global policy entrepreneurs play critical roles in the dissemination of policy solutions; artefacts such as policy documents, or even classroom materials, circulate through professional development events; and policy communications are increasingly undertaken through electronic communications via live video, video recordings, email, and social media. In the years following the publication of Urry and Sheller’s seminal works (Urry & Sheller, 2006; Urry 2007), there has been a proliferation of communications technology which has blurred the boundaries of these already interdependent mobilities.

Conferences are hosted with virtual participants who present via live video, which may be recorded and circulated through social media and email listserv channels. Through such means, high-level policy actors may virtually “enter” the local space of a classroom to interact with students, for example, when the Canadian Minister of Environment and Climate Change, Catherine McKenna, video-chatted with high school students in 2017 (Climate Action 150, n.d.)

Building on mobilities scholarship, research specifically into “policy mobilities” has emerged (Peck & Theodore, 2010; Temenos & McCann, 2013). Rather than a coherent field of study, policy mobilities scholars argue that this approach “resemble[s] a rolling conversation”

³ It is important to note here that this is one typology, rather than a definitive description of all possible movement.

(Peck, 2011, p. 774) on the means and methods of policy movement. McCann and Ward (2012) suggest that this research approach is most accurately termed “policy assemblages, mobilities, and mutation” in recognition of the contingency and mutability of policy movement. In other words, policies rarely travel as single documents or ideas; they may “hitch rides” on more flashy proposals or become contextually linked to locally-intelligible discourses. Policies are mobilized by diverse actors with complex motivations and resources and enacted in specific local contexts; as such, adaptation or mutation is likely if not inevitable.

Though policy mobilities represents a relatively recent branch of scholarship, policy sciences have historically studied policy movement through transfer or diffusion approaches. Though the diffusion of policies from one setting to another is understood as a complex, incomplete, and iterative phenomenon (Marsh & Evans, 2012), the problem remains that “diffusion” is a passive process. It obscures or downplays “by what logics of intervention” the policy is moved (Dale & Robertson, 2012). Understanding globalization as both process and project (Massey, 2005) means understanding not only how and why these ideas circulate, but also who participates in their circulation. This is not to imply that policy transfer and diffusion studies have ignored the role of agents and actors; rather, policy transfer has provided important conceptualizations of actors as “policy entrepreneurs” (Kingdon, 1984) and shed light on when and how they contribute to adoption of new policy (Mintrom, 1997). However, McCann and Ward (2012) argue that a focus on policy agents, and their categorization, has led policy transfer researchers to neglect deeper investigation of agency and its mediating contexts. The policy mobilities literature represents both extension and critique of the policy transfer approach, problematizing in particular free-market and rational-choice explanations of policy adoption (Peck & Theodore, 2010).

The mobilities literature suggests that policies are mobilizing with greater frequency and velocity than ever before. Peck (2011) describes a “fast policy” regime where “policies that work” are imported across regional and national boundaries. This borrowing of best practices is accompanied by “compressed reform horizons,” along with increased influence of intermediaries- policy entrepreneurs who push through particular ideas (Peck, 2011). As policymakers find themselves facing short timelines for reform, they begin to look for sure bets: “off the rack” policies that have been tried and tested with apparent success elsewhere (Temenos & McCann, 2012). Such policies have important political ramifications: they operate under unspoken agreements about the efficacy of market solutions; they define what problems are

pressing as well as possible solutions; and they are adopted through a smoothing process of constructing comparable contexts between policy origin and destination (Temenos & McCann, 2012).

Education policy discourse moves through, and becomes embedded in, different policy-practice contexts. Some discursive formations may be more moveable than others, a concept described by McLennan (2004) as a “vehicular idea” (in McKenzie et al., 2015). McKenzie and colleagues (2015) deploy the concept of “vehicular idea” to examine the uptake of different terminology into sustainability policy at Canadian institutions of higher education. They suggest that sustainability in “its role as a ‘floating signifier’ (González-Gaudiano 2005; 2009) with rather diffuse meanings across the discourses that gather under its name...can potentially mask the persistence of powerful ideologies like the invisible hand of the free market under variegated conditions of neoliberalization” (p. 16). Through examination of language in policy titles, McKenzie and colleagues show how the policy lexicon has shifted from “environment” to “sustainable development” to “sustainability,” and suggest how this policy mobility has twinned with the mobilities of neoliberalization. Following Peck (2011), this work emphasizes not only the movement of policy, but also the situated contexts of policy development and enactment.

Policy enactment and material contexts. A commitment to understanding both policy mobilities and policy moorings requires that we take seriously the contexts of development and enactment (Ball et al. 2012; Braun, Ball, Maguire, & Hoskins, 2011). Policy enactment research, including into the situated contexts of institutions, schools, and communities, is one attempt to reorient policy research toward the material (e.g. Ball et al., 2012; Thrupp & Lupton, 2006). The school building, though often invoked as the primary place of public education, is more often taken as a matter of fact than a matter of concern for investigation (Gulson & Symes, 2007; Latour, 2004). Benito (2003) argues that the school cannot be understood simply as a “container” in which learning activities [and policy enactment] take place. Instead, “[s]chool architecture is itself a programme...which, in its materiality, institutes a system of values, the frames in which the appropriation of educational culture and a complete semiology which exhibits different aesthetic, social and ideological symbols are carried out” (p. 53).

A renewed interest in material contexts of policy enactment refocuses attention on the nonhuman aspects of policy, including land, animals, plants, objects, buildings, and the entanglements amongst these. Several lines of research are beginning to rethink the role of the nonhuman in education and policy and to re-imagine the material beyond context into

relationship. This theoretical (re)orientation has been termed variously as posthumanism, new materialism(s), critical materialism, critical place inquiry, etc., with differing conceptualizations and methodologies. However, as a beginning, materialist orientations have tended to share the following: (1) consideration of actors/actants/agents that are other-than-human (alongside humans); and (2) a focus on relationality rather than individual agency (Snaza & Weaver, 2015). Relationality has been expressed in terms of networks (e.g. Latour, 2005) or meshworks (Ingold, 2011), and/or the mutually inclusive terms of entanglements and assemblages. New materialist concepts are introduced here for their conceptual and methodological contributions to policy enactment research, including assemblage approaches (e.g. Fenwick, Edwards, & Sawchuk, 2011; Savage & Lewis, 2018). There are also important implications of this work for the field of ESE, particularly in how land, place, and non-humans are engaged across onto-epistemic and methodological domains (Tuck & McKenzie, 2015; Tuck, McKenzie, & McCoy, 2014).

The theoretical framework outlined above provides an orientation to the specific critical policy research trajectories that inform this thesis. Policy enactment emphasizes the complexity of policy work in schools, conceptualizing policy-in-practice as a performance contingent on relationships amongst policy texts, actors, and contexts. Policy mobilities directs attention toward the mobile elements of policy production and enactment, focusing on how policies travel through, and embed themselves within, different contexts. This thesis examines the mobility and enactment of ESE mandates emanating from international, as well as national and subnational, sources.

Research Objectives

In alignment with the work of the Sustainability and Education Policy Network, this dissertation aims to provide rigorous analysis of ESE policy and practice in the Canadian K-12 public school system. This work is intended to contribute to both academic and practitioner knowledge, in part through this dissertation, but also through other forms of knowledge dissemination appropriate to different audiences. The rationale and forms of knowledge dissemination linked to this dissertation are elaborated in Chapter 5.

The dissertation is constructed according to three objectives, each addressed through an individual manuscript:

Objective 1: Systematically document the state of policy research in K-12 public education within the field of ESE, in order to identify areas of relative strength and weakness and assess priorities for effective and engaged policy research.

Objective 2: Provide a pan-Canadian analysis of ESE educational policy texts developed by provincial ministries of education, in order to examine policy mobility of international ESE mandates.

Objective 3: Using a comparative case study approach, examine the relational influences of school-based policy actors, and their material contexts, on ESD policy enactment in the province of Manitoba.

Methodology and Methods

I open this methodology section with a brief ontology of methodology and its relationship to methods, as I believe that my personal orientation to theory, methodology, and methods have shaped each step of my research process, from conceptualization to participant engagement to analysis and writing. This dissertation resides within an interdisciplinary department; however, its production draws together some distinctly disciplinary threads, including through its potential readership who bring their own (inter/multi) disciplinary training. As such, my intention here is to make (more) intelligible my research approach and acknowledge its influences. These distinctions of method and methodology are often considered characteristic of qualitative research; (most) quantitative research falls within a positivist paradigm in which the world is objectively “knowable”, and methodology is therefore only appropriate if one is making explicit study of methods.

Briefly, I define “method” as a tool of research collection and/or analysis, while methodology is a “theory of method” which creates a coherent link between theory and methods. In their introduction to the fourth Sage Handbook of Qualitative Research, Denzin and Lincoln (2011) use of the term “strategy of inquiry” which they define as “a bundle of skills, assumptions, and practices that researchers employ as they move from their paradigm to the empirical world” (p. 15). This definition highlights the role that methodology plays in linking onto-epistemic research framing(s) to researcher methods. Research paradigms are often represented in hierarchical terms; i.e., ontology dictates epistemology, which informs methodology and subsequently choice of method. However, it is also important to recognize that overarching orientations to research, ontology, epistemology, and axiology, play roles in the minutiae of research interactions. Small decisions in methods, like the length of pause in an interview, or a decision to probe (or not to probe) further, are mediated by research paradigm and researcher-participant-context entanglements that emerge during interaction. Methodology can provide a means of making explicit the rationale of these micro-decisions.

The methodology employed in this dissertation was developed through in-depth review of critical policy studies within the respective fields of educational policy research (Ball et al. 2012; Bartlett & Vavrus, 2017; Ozga, 2000; Rizvi & Lingard 2010) and policy mobilities studies in urban geography (Peck & Theodore, 2015; Temenos & McCann, 2013). While the overall methodological orientation is critical comparative policy research, each chapter uses a different lens to achieve its objectives. Chapter 2 uses the approach of systematic review, and Chapters 3 and 4 focus on multi-sited comparative approaches, which are described in greater detail in the data analysis section below, as well as within each manuscript chapter.

All of the research for this dissertation was conducted as a team member of SEPN, as part of a coordinated, comparative analysis of ESE policy and practice in Canada. This dissertation represents one segment of the overall research project and includes intellectual contributions by other SEPN team members in data collection, analysis, and writing. I was integrally involved in all research components pertaining to this dissertation. The first two manuscripts (Chapters 2 and 3) represent significant scholarly contributions of SEPN, and, therefore, frameworks of data collection and analysis were co-developed with my co-authors. In each case, I led analysis and writing. The final manuscript included in this dissertation (chapter 4) is sole-authored; however, research design and data collection included several SEPN team members.

Data collection. Methods of data collection vary by chapter. Chapters 2 and 3 are based on document collection, in the first case, peer review policy research, and in the second, provincial policy documents. Chapter 4 also includes policy document collection, as field-based research methods of interviews, focus groups, and researcher photo-documentation and observations.

Document collection for systematic literature review. Chapter 2 was completed with co-authors, McKenzie (project PI) and Vaughter (postdoctoral fellow). We focused document collection on peer review journal articles within the field of ESE, and which provided analysis of policy through either empirical or discussion and report-based methods. We used multiple search engines (ERIC; Scopus) combined with a manual review of abstracts for five key journals within the field. This offered a total of 215 journal articles.

ESE policy document collection. Chapter 3 is an analysis of ESE policy documents from provincial and territorial ministries of education, with co-author McKenzie. Ministerial policy texts were collected through an intensive search of all ministry of education websites, as well as a keyword search, both within government-designed search engines as well as Google. This

search also included collection of ministry mission and vision statements and cross-curricular competency frameworks⁴. The research reported in Chapter 3 is based on 17 policies from 6 provincial and territorial ministries of education.

Field-based data collection in Manitoba. Chapter 4 includes three levels of “on-the-ground” data collection: The Department of Education and Training in Manitoba, regional school divisions, and local schools. Field-based data collection for this thesis represents one slice of a larger SEPN project that included five provinces and the territory of Nunavut (Figure 1.1). As part of the overall SEPN site selection architecture, two school divisions in Manitoba were selected for participation, with two participating schools in each school division. Data collection consisted of interviews and focus group

Table 1.1 Summary of data collection across locations and participant types.

	Ministry of Education	School Division (SD)	School
Data Collection Methods	1. Document collection (Ministry policies) 2. Interviews	1. Document collection (SD policies) 2. Interviews 3. Focus groups (Stakeholders)	1. Document collection (School policies) 2. Interviews 3. Sidewalk Interviews 4. Student Focus groups 5. Photo documentation
Participant Types	Ministry staff (2)	Staff (1-2/SD) Trustees (1/SD) Stakeholders (3-10/SD)	Principals (1/school) Teachers (2-5/school) Students (~30/school)
Total participants	2 total	18 total	194 total

data, policy texts, and field observations, including written notes and photo documentation. Participants included ministry staff, school division administrators and staff, school administrator, teachers, and students (Table 1.1). The project team collected field-based data (interviews, focus groups, photo documentation, observations) from these participant types across Canada as outlined in Table 1.1, and as outlined in further detail below in relation to the data collected from Manitoba.

⁴ For a broader analysis of evidence of sustainability commitment across provincial ministries of education and school divisions, see Beveridge, McKenzie, Aikens & Strobbe (in press).

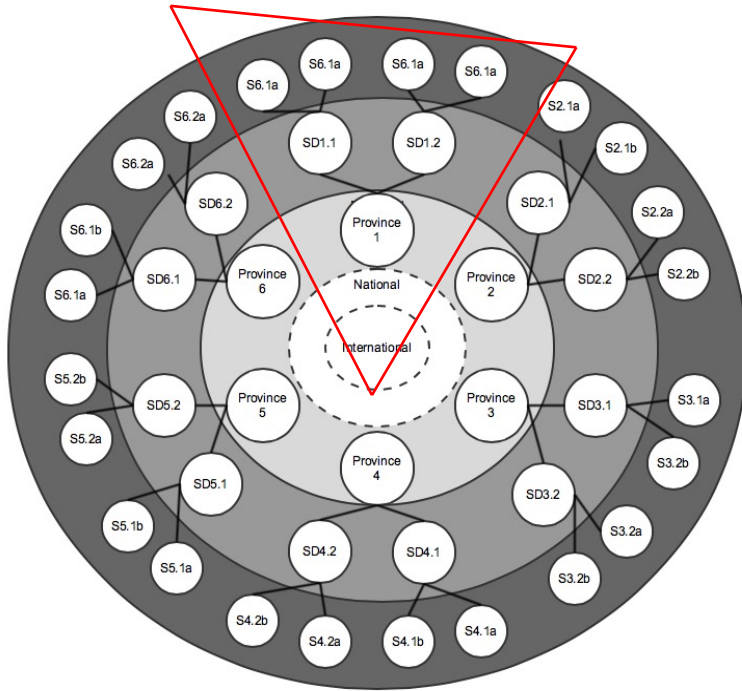


Figure 1.1 Conceptualizing the sites of K-12 field research (“site analyses”). The red triangle indicates the province of MB in relation to other provinces included in overall SEP project research. (Figure from document “T2- SEP Site Analysis Methods”)

Interviews. We conducted interviews with two staff members from the Manitoba Department of Education and Training (Ministry of Education), and directors, staff, and trustees from the two school divisions. At the school level, we completed 18 interviews with principals, teachers, and staff members. Interviews with Ministry and school district staff were conducted over the phone, while interviews with school-level participants (principals, teachers, and staff) were conducted on site, at the schools. All interviews were digitally recorded.

We completed interviews with the support of an interview protocol developed by members of the SEP team for both K-12 and postsecondary research environments (Appendix A). The interview protocol was designed to elicit participant assessment and experiences of sustainability policy and practice in their particular context (i.e., school, school division). The interview structure was largely fixed, with flexibility on the part of the researcher to determine whether to include or omit particular sections based on participant knowledge. Interview length

was between 45 and 90 minutes and included an interactive evaluation tool created by SEPN⁵ as a web-based “Heat Diagram” application. The Heat Diagram asked participants to evaluate “how hot” their institution (e.g. school) was performing, in terms of whole school sustainability. The application asked participants to rate their institutional context across five domains of (1) Governance and Leadership, (2) Teaching and Curriculum, (3) Research, (4) Community Outreach, and (5) Facilities and Operations. An additional category of “Other” was included to allow participants to record information about any other aspect of sustainability that was not addressed in the five domains. An example of this Heat Diagram, with ratings, is included in Appendix B.

Sidewalk interviews. Sidewalk interviews were brief, five-minute interviews conducted with passers-by (students, staff, visitors) at school sites. We invited participants to participate in a short assessment of their school’s engagement with environmental and sustainability practice (Appendix C). Participant answers were recorded with the interactive “Heat Diagram” application. We completed a total of 74 sidewalk interviews.

Focus groups. We conducted focus groups with primary and secondary students, as well as community members in each school division location visited. In total, seven student focus groups and two community focus groups were conducted in Manitoba. Focus group protocols for primary students and secondary students and community members are appended (Appendices D and E).

Field observations. All members of the research team maintained on-site and post-site observations and reflections in the form of field notes. These also included descriptive notes for each photo collected as part of the photo documentation process (Appendix F).

Photo documentation. This research method was structured to include photos across eight pre-determined categories and designed to capture instances of sustainability “performance” as well sustainability gaps. The eight categories are as follows 1) Indoor spaces; 2) Outdoor spaces; 3) Green Spaces; 4) Food; 5) Transportation; 6) Waste; 7) Data (including certification, audit reporting, etc.); 8) Emotions. An “Other” category was included to capture significant photos that did not fit into the pre-determined categories (Appendix G).

⁵ As an acknowledgement of all intellectual contributions involved in the creation of the Heat Diagram, I list all involvements here. Arjen Wals first suggested the idea of a “heat diagram” at a team meeting in April 2015. I developed a prototype based on discussions with Principal Investigator Marcia McKenzie and Project Manager Nicola Chopin. The web-application was developed by contractor Tim Maina, with the support of Naomi Maina and Nicola Chopin.

Policy documents. Detailed document collection protocols are included in Appendix H. In addition to intensive data collection at the provincial, regional, and local levels, I collected and analyzed national and international policies pertinent to the former contexts. This includes international and national documents (1) related to the International Decade of Education for Sustainable Development; (2) authored by the Manitoba Department of Education and Training staff; (3) that reported on ESE in Manitoba; and/or (4) mentioned by a participant during interviews or focus groups.

Data analysis. The following provides an overview of methods of analysis for each manuscript. Full details of analysis are included in the methods section of each chapter.

Analysis methods for systematic literature review. Analysis of peer review articles involved several cycles of inductive and deductive classification. We categorized all articles according to geographic region of study, article type (empirical/non-empirical), and methodological orientation. We then assigned qualitative themes according to research focus, for example, focus on policy drivers, and/or teaching and learning directives. These qualitative themes were developed through an initial inductive content analysis and team discussion, followed by the creation of a structured thematic classification scheme.

Analysis methods for ESE policy texts. For document analysis in Chapter 3, we used an iterative analytic process, involving multiple stages of document analysis and facilitated by the qualitative data analysis platform, NVivo 11. The first stage focused on the development of a structured codebook through inductive coding, the second included identification of three policy clusters through assessment of inductive coding patterns, and the third stage involved application of a comparative, categorical analysis across the three policy clusters.

Analysis methods for field-based data collection in Manitoba. Analysis in Chapter 4 relied on the comparative case study methods by Ball and colleagues (Ball et al., 2012), with a focus on the relationships between school-based policy actors and the material contexts of ESD policy enactment. I conducted all analyses using NVivo 11, with a two-step process of (1) auto-coding and formalized memo-writing, as part of the larger SEPAN project, followed by (2) an inductive and iterative analytic coding process focusing on actors, material contexts, and the relationships amongst these.

Research Ethics

Prior to conducting all research with participants, we obtained permission from the Behavioural Research Ethics Board at the University of Saskatchewan. In addition, we contacted

each school division prior to commencing our research in order to satisfy any divisional ethics requirements. Our research did not require students to divulge personal or sensitive information and was determined by the University of Saskatchewan Research Ethics Board to fall within the scope of expected classroom activities. As such, neither school division in Manitoba required parental/guardian permission for student participation. Caregivers were informed of the research taking place within their child's classroom and had the opportunity to withdraw their child's responses from the research programme. During each research activity with students, we explained the activities in accessible language and emphasized the right to refuse or discontinue participation. We offered students forms to sign indicating their consent (Appendix I). Several students exercised their right to refuse participation. We also checked in with students both individually and as a group, as needed, to gauge comfort with the activities. Teachers remained in the classroom during student focus groups and provided support, including alternate activities in the case of younger students who decided not to participate (two students total). In each focus group, we took care to create a positive atmosphere and encourage discussion. We found that in-situ modifications to protocols were occasionally necessary for classroom management.

Adult interview and focus group participants were also provided consent forms (Appendix J) and offered the opportunity to refuse participation. In one case, a high school principal preferred to speak off the record and none of this information was retained as part of this analysis.

Thesis Structure

This dissertation is constructed as a "submission by manuscript" document and conforms to the requirements set out by the College of Graduate and Postdoctoral Studies, as well as those dictated by the School of Environment and Sustainability at the University of Saskatchewan. There are several differences in structure compared to thesis submission by monograph, the most important of which is the approach to literature review and methods. While monograph-style dissertations tend to include literature and methods as separate, self-contained chapters, manuscript-style theses address these components in each manuscript submitted.

This thesis includes five chapters in total, three of which are stand-alone manuscripts suitable for peer-review publication. To date, the first manuscript (Chapter 2) has been published in *Environmental Education Research* and reproduced as a book chapter. Chapters 3 and 4 will be submitted for publication in spring 2019. Chapters 2 and 3 are co-authored while Chapter 4 is

a single-authored manuscript. In both co-authored chapters, I provided substantial contributions (i.e., lead-authorship) with respect to data collection, analysis, and writing.

Chapter 2:

Aikens, K., McKenzie, M., & Vaughter, P.V. (2016). Environmental and sustainability education policy research: A systematic review of methodological and thematic trends over time. *Environmental Education Research*. 22(3), 333-359.

and

Aikens, K., McKenzie, M., & Vaughter, P.V. (2018). Environmental and sustainability education policy research: A systematic review of methodological and thematic trends over time. In K. Van Poeck, J. Lysgaard, & A. Reid (Eds.), *Environmental and sustainability education policy: international trends, priorities and challenges*. (pp.265-291). New York, NY: Routledge.

Chapter 3:

Aikens, K. & McKenzie, M. The global ESD assemblage in Canadian context: ESD, EE, and Indigenous education across six provinces and territories.

Intended submission: *Journal of Curriculum Inquiry*, Spring 2019

Chapter 4:

Aikens, K. A comparative case study analysis of ESD policy enactment in the Canadian province of Manitoba

Intended submission: *Journal of Environmental Education*, Spring 2019

Chapter 2, “Environmental and sustainability education policy research: A systematic review of methodological and thematic trends over time,” is a systematic review of policy research within the field of ESE. It used quantitative and qualitative assessment methods to describe trends in research output, research focus, geography, and methodology. Building on the findings of the systematic review process, we provided recommendations for ESE policy research, including greater investment in critical policy theory and methodology, intersectional policy analysis and climate change education.

Chapter 3, “The global ESD assemblage in Canadian context: ESD, EE, and Indigenous education across six provinces and territories,” is an analysis of environmental and sustainability education policy texts across six provincial and territorial ministries of education. We

documented three distinct policy clusters, related to sustainable development, environmental education, and Indigenous education, each emphasizing different foci and different relationships to a global ESD assemblage.

In Chapter 4, “A comparative case study analysis of ESD policy enactment in the Canadian province of Manitoba,” I examined ESD policy enactment in four Manitoba schools, focusing on the relationships between school-based policy actors and material contexts. Chapter 4 documented the successes of two schools with respect to the provincial eco-certification program, which functions as a provincial policy apparatus encouraging whole school sustainability uptake. In the first case, I explored the relationships that permitted one school to “leapfrog” past its sustainability designation, while in the second, I examined how another school has sustained a “Transformational” level of sustainability certification. I also discuss the challenges experienced by two schools who struggled with maintaining successful ESD policy enactment. This chapter highlights the role of “relational” leadership, which is distributed amongst different school-based actors and reliant on material infrastructures.

In the final chapter I provide a brief summary of each chapter, then outline the scholarly contributions of this dissertation. I discuss research dissemination and impact, as well as limitations of the research.

Transition

Chapter 1 provided research justification, objectives, and organization of this dissertation. The following chapter is a deep dive into the state of policy research within the field of environmental and sustainability education. In order to develop a comprehensive database of peer-review policy research articles, we used a systematic search process with defined inclusion-exclusion criteria, combined with a manual process of reviewing journal abstracts. We documented patterns in: policy research outputs over time, geographic representation of study region, and methodological research approach. We also evaluated research focus across articles, using an iterative coding process to first develop, then apply, a deductive coding framework. Findings indicated a relatively weak base of empirical policy research within the field of ESE; furthermore, most empirical research focused on policy implementation as it related directly to teaching and learning, with an overall neglect of other vital areas of policy research. This paper has been published as

Aikens, K., McKenzie, M., & Vaughter, P.V. (2016). Environmental and sustainability education policy research: A systematic review of methodological and thematic trends over time. *Environmental Education Research*. 22(3), 333-359.

CHAPTER 2: Environmental and sustainability education policy research: A systematic review of methodological and thematic trends

Introduction

This paper responds to calls to strengthen policy research in sustainability education (Læssøe, Feinstein, & Blum, 2013; Robottom & Stevenson, 2013), by offering a systematic review of existing policy research in environmental and sustainability education, and particularly in the area of kindergarten to grade 12 (K-12) education. As Læssøe et al. (2013) write in a recent special issue with a focus on policy research and sustainability education, “there is an urgent need for more EE/ESD/CCE⁶ policy research that not only focuses on policy discourses but also engages with the full range of the policy cycle” (Læssøe et al. 2013a, 235). Likewise, Nazir et al. (2009) suggest that there is a lack of research on the implementation of sustainability education⁷ policy, and what documentation does exist tends to be self-reports from government or sustainability organizations that function as “uncritical catalogues that focus on successes and are silent about problems and failures” (p. 27). By outlining in greater detail the policy research that has been undertaken to date, this review aims to provide a platform for a broadened diversity of policy studies in environmental and sustainability education.

Educational policy research is a relatively recent field of inquiry (Ball, 1997). With an initial focus on a “policy science” approach in which one works to determine “the technically best course of action to adopt in order to implement a decision or achieve a goal” (Fay, 1975, p. 14), research in education policy has since expanded and diversified. Education policy studies now often include a focus on policy origins or the influences on policy development, as well as considering policy implementation as a situated and interactional process in which policies may be shaped, resisted, or otherwise enacted in practice (e.g. Ball, Maguire, & Braun, 2012;

⁶ These acronyms stand for Environmental Education, Education for Sustainable Development, and Climate Change Education (Læssøe, Feinstein, and Blum 2013).

⁷ Nazir et al. (2009) use a range of terms, including climate change education, education for sustainable development, and environmental education.

Heimans, 2014; Webb & Gulson, 2015). How policy is understood has important consequences for the approaches taken in policy research: from the questions that are asked, to the methodologies and methods engaged, to recommendations made. In this paper we undertake a literature review of how various studies in environmental and sustainability education have framed and engaged in policy research.

In the review we limit our discussion to K-12 education policy studies that self-define as sustainability or environment-related, recognizing that in doing so, we may have excluded research with important connections to sustainability, for example, education policy research in areas of multiculturalism, Indigenous knowledge and pedagogies, health and wellness education, or school food policies. Throughout the paper we use “sustainability education” as an umbrella term encompassing environmental education, education for sustainable development (ESD), education for sustainability, and other forms of education concerned at least in part with land and environment. However, where contextually or historically appropriate in relation to the literature being discussed, we use the specific terms used in the research. The review seeks to offer a descriptive analysis of trajectories, gaps, and scope of policy research in sustainability education. Key themes and findings of this systematic literature review include the following:

- We observed three apparent “spikes” in policy research output: first, in the mid-1970s; second in the late 1990s; and third, from 2005-present. The last spike may indicate increased policy research activity resulting from the Decade of Education for Sustainable Development (DESD).
- Geographic categorization of research indicated under-representation of large geographical areas, including Africa, South and Central America, Eastern Europe, and most of North and West Asia.
- Most of the studies reviewed (70%) were “non-empirical” in approach and focused on discussion or reporting of national and international policy contexts.
- While empirical approaches to policy research diversified over the last several decades, most studies focused on teaching and learning directives, leaving policy development and enactment relatively neglected area of research.
- Environmental degradation and international policy contexts were frequently described as drivers of sustainability uptake in education policy. Despite this, we noted a dearth of research that examined education policy in relation to climate change, particularly prior to 2005.

In what follows, we outline the methods of the literature review, and describe our findings in further detail. We conclude by describing key research gaps as highlighted by the review and propose directions for moving forward policy research in sustainability education.

Methods

Data were collected for the literature review during the period of October to December 2013. We began by searching the Education Resources Information Center (ERIC) database using the search terms, “environment*” OR “sustainab*” combined with “education” AND “policy” and excluded all articles classified through ERIC as “Higher Education.” We performed an additional search of all articles classified under the ERIC descriptor “education policy” for environment* or sustainab*, again excluding all Higher Education articles. These complementary search techniques allowed us to capture relevant articles that may have been classified in different ways. After removing dozens of unrelated articles (e.g. “sustainability of mathematics curriculum,” “classroom learning environment”), we performed a crosscheck in the Scopus database using the same search terms. Finally, in order to ensure we had not excluded important policy research, we manually reviewed the following five journals, from their inception to 2013: Environmental Education Research, Journal of Environmental Education, International Journal of Educational Development, Journal of Education for Sustainable Development, and the Canadian Journal of Environmental Education. This last journal was included because of our positioning as researchers of Canadian education policy.

Despite attempts to provide a comprehensive survey of the policy literature to date, we recognize the limits of surveying only English language literature. Based on the database and English-language journals reviewed, this analysis of existing policy research includes mainly research on settings in the UK, US, Australia, Canada, and New Zealand, and relatively few studies focused on sites in Latin America, non-Anglophone Europe, and parts of Asia. In countries where English is widely spoken in post-secondary institutions and research centers (e.g. China, South Africa), exclusion effects due to review search methods may be weaker.

Hart and Nolan (1999) discuss the challenges of delimiting literature searches when reviewing a field of research, including acknowledgment that the material selected as representing a body of research represents only one of several legitimate choices. We chose to limit our review of policy research to literature published in peer-reviewed journals, so as to provide a comprehensive and systematic review of this particular body of research. While we do not define our work as meta-analysis, we consider it a systematic review within the noted

delimitation for its specified inclusion/exclusion criteria and triangulation through multiple search methods, in line with search processes described for qualitative research syntheses (Major & Savin-Baden, 2010). After a complete review of all papers and the exclusion of those that were not policy focused (i.e. contained only brief allusions to policy in the introductory or concluding sections, or focused on higher education or nonformal education, etc.), there were a total of 215 articles.

We completed several cycles of reading and analysis of the collected articles. The first round of reading involved an open reading of the articles and note taking, and then based on emergent themes, we determined several categories of analysis. These analysis methods were exploratory in nature, combining basic quantification of trends (regional and national counts and percentages) and research approaches (counts of research types), with deeper qualitative analysis of content-based themes discussed within the publications. In alignment with typologies used previously in analysis of environmental education research (e.g. Reid & Scott, 2008), all publications were classified as either “empirical” or “non-empirical.” Empirical articles were defined as studies that used quantitative or qualitative research methods. We further subdivided this category into “survey,” “textual analysis,” “case study,” “mixed,” and “other.” The category of non-empirical included all articles in which research methods were not defined by the authors and included the following types: discussion of international policy discourse (“discussion-international”); discussion of national policy discourse (“discussion-national”); or descriptive reports of national or regional projects/programmes with little to no commentary (“report”) (see Table 1). A small number of papers in this category also discussed proposals for alternative policy approaches to sustainability education and were identified as “alternative policy proposals.” By using the terms empirical and non-empirical, we are not suggesting that one categorization is superior to the other, but that both are common and valid ways of engaging in policy research.

Table 2.1 Categorization of research approach

Empirical	Non-empirical
Survey	Discussion-international
Textual analysis	Discussion-national
Case study	Alternative policy proposal
Mixed	Report
Other	

Findings

Temporal and geographic trends. The total of 215 research articles had publication years spanning from 1974 to 2013 and focused on education policy in 71 different countries. Dividing the literature into three periods of research, 1970–1989; 1990–2004; and 2005–2013, there was an overall increase in number of published policy related articles, with an average of 1 per year in 1970–1989 (20 total), 5.1 per year in 1990–2004 (77 total) and 13.2 per year in 2005–2013 (118 total). There appear to be three distinct “spikes” in policy research output: first, in the mid-1970s; second in the late 1990s; and third, from 2005-present (Figure 2.1). The first small spike in the mid-1970s we attribute to a flurry of studies from the United States examining national and state-level policies for environmental education. This timing follows the official nascence of the field of environmental education, which is often dated in relation to the 1970 meeting of the IUCN (Palmer 1999), as well as the U.S. Environmental Education Act (Hepburn & Keach, 1974). There is another spike in the number of policy studies in the late 1990s, in which many articles discuss the implications of Agenda 21 – the outcome of the 1992 United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil. After a

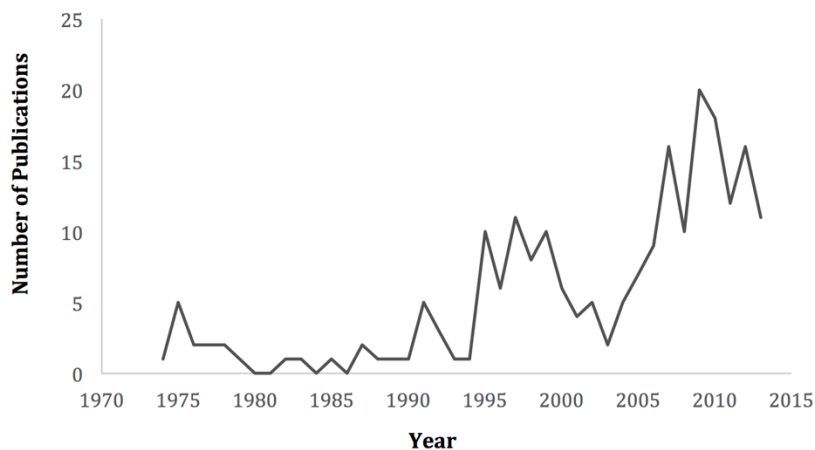


Figure 2.1 Number of policy-related articles from 1974 to 2013. Note the spike in the late 1970s, late 1990s (post Agenda 21) and late 2000s-onwards (UN DESD).

brief dip in research in the first half of the 2000s, there is another increase in policy research around the mid-2000’s, in which a number of articles discuss the advent of the UN DESD (2005–2014).

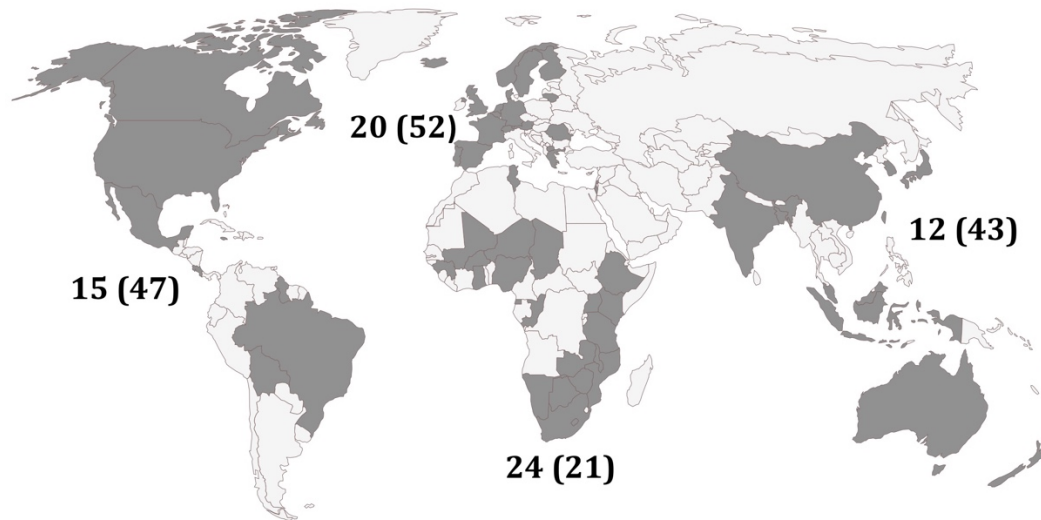


Figure 2.2 Map of research on sustainability education policy included in this review. Shaded countries are represented by at least one publication. Regional totals for Africa, the Americas, Asia-Pacific and Europe are included with total number of countries represented, and in brackets, total number of English language studies based in those countries.

Figure 2.2 provides a broad overview of the number of articles from countries in each of four regions: Africa, Americas, Asia-Pacific, and Europe. While this review encompassed research based in 24 African nations, Africa was the most under-represented region by total number of papers (21). There was a total of 52 publications on settings in Europe (20 countries), 47 publications on the Americas (15 countries), and 43 publications on the Asia Pacific region (12 countries). The remaining 59 papers⁸ in this review were international in scope. Gaps in research-coverage are apparent (Figure 2.2): many countries in South America, Eastern Europe, North and West Asia, and North Africa are entirely unrepresented in the reviewed literature.

The review also indicates a high quantity of papers from particular countries (Figure 2.3). The majority of countries included in this review are represented by a single publication, with the most frequently researched countries – the United States, the United Kingdom, Australia, China/Hong Kong, and Australia – representing over half of the total publications in the review. This finding is aligned with previous discussions of the geographic distribution of published

⁸The sum here (59 international + 163 regional = 223) yields more than the 215 total articles reviewed as several articles surveyed more than one region.

environmental education research (Reid & Scott, 2008) and is particularly significant in the interpretation of major themes arising from the review. In other words, we suggest that the issues of policy concern as identified through this review are largely reflective of the most heavily researched national policy contexts. In what follows, we discuss other review findings in relation to the terminology used in the articles, type of research papers, and key themes in the literature.

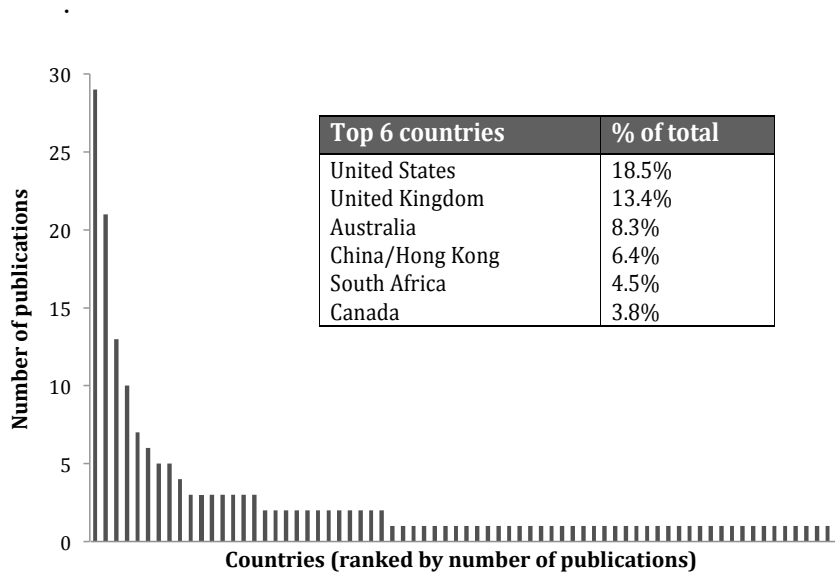


Figure 2.3 The relative distribution of articles by country, with each bar representing the total number of publications per country. Countries on the left were the focus of a large proportion of the publications (as included in inset table).

Terminology. The reviewed research suggests that sustainability has been included in K-12 formal education policy research over the past four decades mainly using the terminology of “environmental education” and “education for sustainable development.” Acknowledging roots in conservation ecology and rural studies, articles authored in the 1970s and 1980s referred to environmental education, or education for the environment (e.g. Schoenfeld, 1975; Wheeler, 1983). Though the concept of sustainable development began circulating in UN documents as early as 1980 (Sauvé, Berryman, & Brunelle, 2007), it was the Brundtland Report (Brundtland, 1987) that cemented use of the term. This review shows a corresponding emergence in 1990 of research focused on education for sustainability/sustainable development policy imperatives. Figure 2.4 tracks the terminology used in publication titles of all articles reviewed, sorting references into three categories: “environment/environmental education,” “sustainable development,” and “sustainable/sustainability.” We found that titles referencing environmental education peaked in the late 1990s, while titles referencing sustainable development spiked

sharply after 2005, the inauguration of the UN DESD. There has been a small, consistent increase in the number of titles using the terminology “sustainable/sustainability” beginning around 2005.

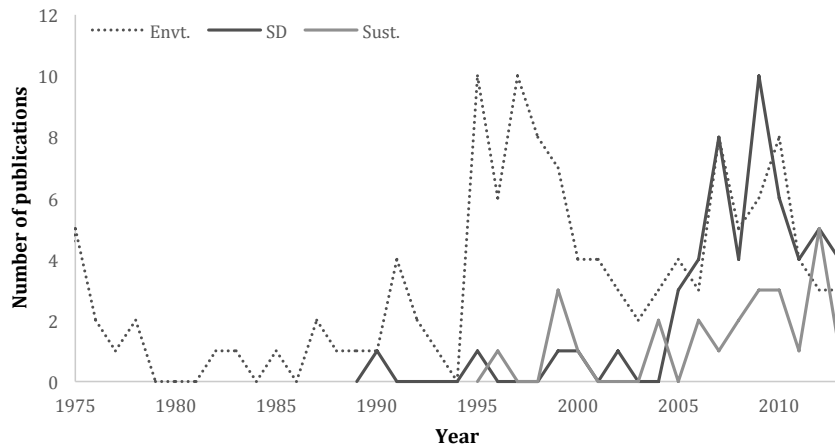


Figure 2.4. Tracking use of terminology in titles of reviewed articles from 1975 to 2013. The upper dotted line represents publications which included “environment” in the title; the solid line represents publications which included “sustainable development” in the title; the dashed line represents all publications which included “sustainable/ sustainability” in the title.

Research approach. Of the total of 215 papers reviewed, the majority were non-empirical articles (150 or 70%), while 65 were empirical (see Table 2.2 for a breakdown of the number of papers per specific method type). Surveys made up the plurality of empirical articles, though textual analysis, case study, and mixed (multiple) methods were also identified. Most non-empirical articles focused on national level discussions, and most of the reports were of national policy developments.

Table 2.2 Categorization of literature review articles by research type

Research approach	Categorization	Number
Empirical	Survey	26
	Textual analysis	18
	Case study	13
	Mixed	5
	Other	3
	Total	65
Non-empirical	Discussion-international	37
	Discussion- national	51
	Discussion-other	7
	Report	45
	Total	150

Over time, empirical approaches to policy research have diversified (Figure 2.5). The 1970s and 1980s are characterized by the use of surveys to assess policy implementation and outcomes, while the 1990s through to 2004 saw the introduction of other research methods. In the final temporal period (2005–2013), most researchers chose either textual analysis or case study research to undertake policy research.

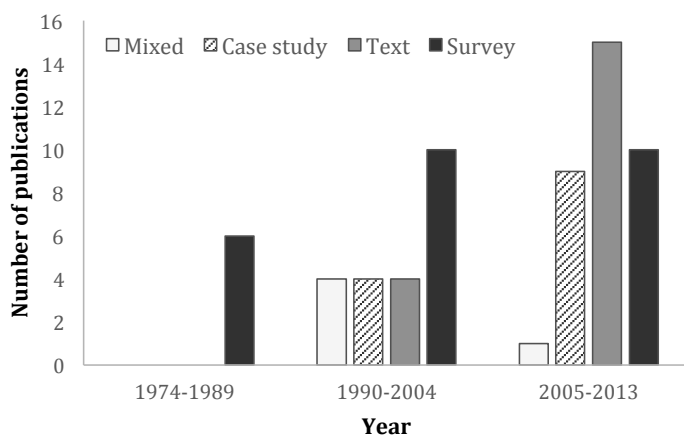


Figure 2.5 Changes over three time periods in types of empirical policy research.

Thematic coding. The 215 publications were analyzed through a process of iterative thematic coding, inductively developing a set of themes and subthemes (Table 2.3). Our initial reading and subsequent coding coalesced around four main themes identified in the articles reviewed pertaining to education policy: (1) policy drivers; (2) competing paradigms; (3) teaching and learning directives; and (4) marginalizations. In the following sections, each of the sub-themes will be discussed. Our definition of policy includes a broad conception, which extends beyond considerations of policy texts, to influences on policy development as well as on the enactment or practice of policy (Braun, Maguire, & Ball, 2010). The policies which constitute the focus of study, in their form, development, or enactment, include not only those texts labeled as policies at a national or regional level, but also international declarations and proposals.

Many of the papers included in the analysis were represented by multiple themes, addressing, for example, both policy drivers and teaching and learning directives (e.g. Iyengar & Bajaj, 2011; Stimpson & Kwan, 2001). Though themes were often overlapping, we can report on the overall “extent of engagement” with each thematic area. Within the four main thematic areas,

two thirds of papers included discussion of teaching and learning directives (67%), one third of papers discussed policy drivers (33%), 22% competing paradigms, and 18% marginalizations.

Table 2.3. Content analysis, themes and subthemes from literature review

<p>1. Policy Drivers</p> <p>Sustainability contexts as policy drivers</p> <p>International contexts as policy drivers</p>
<p>2. Competing Paradigms</p>
<p>3. Contexts of Curriculum and Pedagogy</p> <p>Curriculum</p> <p>Teaching and pedagogy</p> <p>Competing policies</p>
<p>4. Marginalizations</p>

Policy drivers. One of the main content themes identified in the policy research was a focus on policy drivers, or in other words, on factors that have contributed to the development of policy. Key drivers discussed were (i) environmental and social imperatives influencing policy development, as well as (ii) international policy initiatives and their impact on national and regional policy. In what follows we discuss each of these areas in turn.

Sustainability imperatives as policy drivers. The impetus for sustainability education policy was often described in instrumental terms, in terms of having particular political or environmental aims. Sustainability education was positioned in policy research as a solution to environmental degradation, and as well as socio-cultural degradation, (Adara, 1996; Adedayo & Olawepo, 1997; Breiting & Wickenberg, 2010; Stimpson, 1997). Adara (1996), for example, in discussing the social studies curriculum in Nigeria, suggested that the directives provided by policy did not “adequately empower the citizen for responsible environmental action” (p. 238); and thus adequate environmental education was deemed necessary to halt “socio-cultural and environmental decay” (p. 238).

The papers reviewed also included studies that examined how sustainability education policy was responding to specific environmental disasters, or inversely, research which found a lack of adequate response to disasters through policy. For example, papers discussed how

education policy should better respond to tragedies such as the Bhopal chemical spill (Iyengar & Bajaj, 2011), and the Walkerton, Ontario, water-contamination (Puk & Behm, 2003). Based on their analysis of state and national syllabi in India, Iyengar and Bajaj (2011) wrote that “[o]ur findings indicate that the national and state syllabi have made little to no effort to contextualize EE by using the Bhopal gas tragedy as a learning experience” (p. 425). In a state policy context in which there were distinct required EE courses, this study found a focus on decontextualized scientific knowledge versus sociocultural considerations across the syllabi. They concluded that this disciplinary bias and lack of local contextualization left human factors unaddressed, such as errors that led to the Bhopal disaster or the social injustices associated with its implications, which could assist in preventing such incidents in the future.

Climate change stood out as increasingly being invoked as an impetus for sustainability education policy (e.g. Clarke, 2009; Hägglund & Samuelsson, 2009; Viertel, 2010), and in some cases, as having led to changes in education policy. Overall our review suggests that uptake of a focus on climate change in the education policy research literature has been slow, as is the case across the education literature more broadly (Feinstein et al., 2013a). In the first five years post-Kyoto, only one of the reviewed articles (Palmer, 1999) mentioned climate change. Beginning in 2006, however, there was a steady increase in climate change references in the policy literature, and 50% of all reviewed articles published since 2010 invoked climate change in some capacity (Figure 2.6). This may be related to the DESD (2005–2014) placing climate change education on the policy agenda (Feinstein, Jacobi, & Lotz-Sisitka, 2013; Feinstein et al., 2013a), or it may simply reflect increasing climate concerns globally, especially in light of recent extreme weather

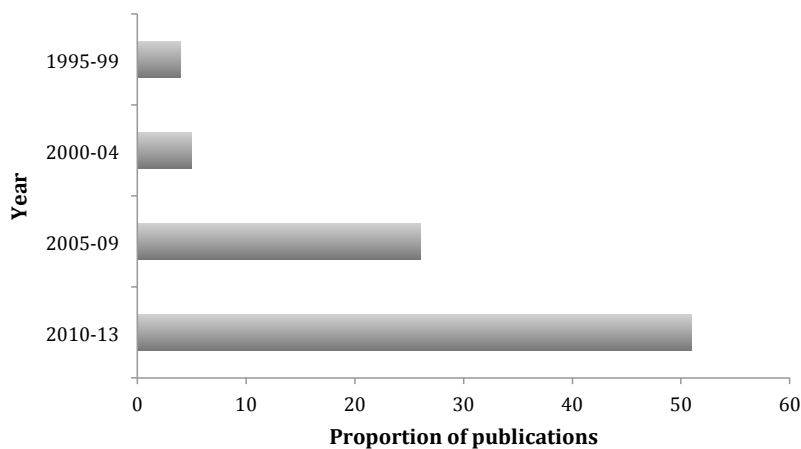


Figure 2.6 Proportion of articles referencing climate change across four time periods.

events. Several authors noted that the challenge of coping with such events might actually reduce participation in sustainability education initiatives, as available resources are channeled into disaster mitigation and prevention, without recognition of education's potential longer-term contribution to climate mitigation and adaptation (Bangay & Blum, 2010).

Alongside papers examining social and environmental drivers of sustainability education, a handful of articles instead interrogated surrounding assumptions of environmental degradation as a pressing need requiring an urgent policy response (Bak, 1995; Sauv , Berryman, & Brunelle, 2007). Bak (1995), for example, discussed a South African context with limited resources and a "backlog" of basic need provision (p. 348). Suggesting that immediate public policy concerns of housing, health, employment, and basic schooling take precedence over environmental education, Bak asked: "What moral base is there for maintaining that we need to ensure the survival of future generations when the present generation is dying as a result of lack of housing, healthcare and food?" (p. 348, emphasis in original). While recognizing the need to legitimize learning for sustainability, Sauv , Berryman, and Brunelle (2007) also cautioned against imperatives for rapid educational re-orientation toward sustainability, wherein the need for action discourages reflexivity and critical thought.

International policy contexts as policy drivers. Prevalent across the reviewed articles were descriptions of the desire to align with international policy imperatives as an impetus for the development of sustainability education policy. Furthermore, international organizations, including United Nations affiliates, the International Union for the Conservation of Nature, and the World Bank, were cited as organizational actors spurring on the uptake of sustainability in education policy (Bernon, 1978; Pace, 1997; Smyth, 1999; Vare, 1998). According to Wheeler (1983), within a few years of the conceptualization of environmental education, there was a perception that it was spreading "world-wide through the agency of [the] IUCN and UNESCO" (p. 10). The Tbilisi declaration (UNESCO, 1978) continued to be cited as motivation for environmental education policy in reviewed articles through the 1990s (e.g. Adara, 1996; Adedayo & Olawepo, 1997).

In a recent case study of Flemish education policy, the authors noted the importance of the Rio Declaration and Agenda 21, followed by the Johannesburg Plan, in setting sustainable development as a national policy imperative to be addressed by lower levels of government (Van Poeck, Vandenabeele, & Bruyninckx, 2013). Other authors discussed national and international non-governmental organizations (NGOs) as applying pressure to national governments to adopt

policy for environmental education (e.g. Pace, 1997; Stimpson, 1997; Vare, 1998). In exception to the above, González-Gaudio (2007) noted that Latin American nations have rarely adopted sustainability education policy in response to international summits.

In Vare's (1998) survey of 15 African countries, bureaucrats responsible for the preparation of National Environmental Actions Plans (NEAPs) expressed concern that World Bank Funding was conditional on the completion of an externally acceptable NEAP. Vare suggested that any environmental education initiatives resulting from this process were likely to be externally motivated and lacking local support. As further evidence of the dominance of international influence relative to local participation, Vare cited comments from the Environmental Protection Agency of Ghana reporting that "time constraints did not allow for a thorough grassroots participatory process in the preparation of the [environmental education] strategy" (p.13). Reporting on the views of diverse Latin American participants in an international seminar on environmental education policy, Barraza, Duque-Aristiza'bal, and Rebolledo (2003) noted the dominant perception of the inextricability of environmental issues and North-South politics. Thus, they suggested:

globally "agreed" environmental education perspectives (such as ideas around education for sustainable development) could be seen as providing the "North" with yet another means to re-shape and re-define people's behaviours and thinking in the "South", in what Escobar (1995) sees can become a subtle but effective control mechanism, and another expression of neo-colonialism. (p. 349)

Competing paradigms. The second significant overall theme identified in the articles was that of "competing paradigms," or in other words, variations and tensions in the terminology and understandings mobilized through forms of sustainability education and research. Many articles referenced or contributed to discussions on the meaning of education for sustainability, (ESD)/sustainable development (SD), and their relationship to environmental education. Smyth described early detractors of ESD as policymakers who "suspect that it represents a "green" attempt to get away from development, or that it disguises what is to be sustained, namely a "northern" affluent lifestyle" (1995, p. 10–11). He noted that "committing one's policy to a term the meaning of which is not clear to all, invites confusion by those who interpret it differently either by fault or intention" (11). Several authors suggested that that, by virtue of its openness to interpretation, ESD fails to challenge business as usual and supports economic primacy, allowing

a neoliberal agenda to further dominant educational policy (González-Gaudiano, 2006; Kopnina, 2012; McKenzie, 2012).

While a large number of articles reviewed presented critique and discussion of the competing paradigms of environmental education and education for sustainable development (e.g. Bonnett, 1999; González-Gaudiano, 2006; Kopnina, 2012; Plant, 1995; Smyth, 1999; Tilbury, 1995), only a handful presented systematic analyses of international level proposals and declarations (e.g. Sauv e & Berryman, 2005; Sauv e, Berryman, & Brunelle, 2007). Several more reported on analyses of national-level documents (Ferguson, 2008; Locke, 2009; Mannion et al., 2011; Van Poeck et al., 2013; Winter, 2007) For example, through analysis of more than 30 declarations from international organizations, Sauv e, Berryman, and Brunelle (2007) described several key findings, including a consistent depiction of economic growth as the primary solution for development, accompanied by an inattention to the systemic causes of poverty. In a national-level analysis of UK curriculum policy for ESD, Winter (2007) suggests that the rhetoric deployed within policy allows ready assimilation of ESD into dominant economic discourse. She described how the main challenges to sustainability, described by the Brundtland report as poor management of the economy and physical environment, are reproduced within national curriculum policy in the UK due to lack of examination of fundamental assumptions. The pervasiveness of the Brundtland definition of sustainable development in policy documents was suggested by Winter to obscure the complexity and contestation of the concept of sustainable development, and the uncertainty of what is to be sustained, for whom, and for how long.

Another predominant theme regarding competing paradigms was the tension between conceptions of environment and nature, and the role of education. In the same analysis discussed above, Sauv e, Berryman, and Brunelle (2007) examined definitions of “nature” and “environment” within international documents, reporting that these have narrowed over decades, such that a “resourcist” approach to the environment (i.e. managing resources for human survival) now dominates international declarations. The authors reported that although instrumentalist and resourcist views of education and environment are common across documents and decades, this focus intensified with increasing deployment of the terminology of sustainable development. Analyses of national level policies also evidenced resourcist and anthropocentric understandings of human-nature relationships (Ferguson, 2008; Locke, 2009; Winter, 2007). Reporting on an analysis of primary curriculum guides in Costa Rica, Locke (2009) noted contradictory themes of human domination of nature, and promotion of harmonious

interrelationship within nature. Ferguson (2008) described an anthropocentric orientation in curriculum guides in Jamaica, which she suggested was somewhat tempered by the parallel evocation of nature's "divine dimensions." In response to a perceived resourcist turn in sustainability education, Kopnina (2012) called for a return to the instrumentalist roots of environmental education, that is, toward developing an ethics of care and responsible environmental behavior.

Teaching and learning. The third major theme identified through the analysis was that of "teaching and learning," which we will discuss in terms of policy research articles with a focus on: curriculum, teaching and pedagogy, and competing policies in relation to teaching and learning. Empirical articles overwhelmingly focused (though not always exclusively) on teaching and learning, with all but 10 of the 65 empirical papers including this emphasis.

Curriculum. Across a wide variety of geographical contexts, reviewed articles focused on state-level policies designed to infuse sustainability education into the curriculum as interdisciplinary competencies (e.g. Adedayo & Olawepo, 1997; de Haan, 2006; Iyengar & Bajaj, 2011; Lee, 1997). Most analyses offered pessimistic findings on the success of cross-curricular integration: rather than infusion of sustainability, this approach was typically found to result in the marginalization of sustainability in the curriculum (Adedayo & Olawepo, 1997; Gayford & Dillin, 1995; Puk & Behm, 2003; Scott & Reid, 1998; Vare, 1998). In an evaluation of ESD policy implementation, Bagoly-Simo (2013) documented heterogeneous implementation approaches across the different policy contexts of Germany (Bavaria), Mexico, and Romania. Using indicators to measure implementation success, Bagoly-Simó analyzed the extent of ESD incorporation into state-level curricula, noting that Mexico's top-down approach to sustainability resulted in greater curricular incorporation of ESD. Nevertheless, implementation approaches across all three contexts were found to treat ESD as "a (hyper)specialized add-on knowledge in an overcrowded curriculum" (Jucker 2011, p. 109).

Through survey research with over 200 high school teachers in Ontario, Canada, Puk and Behm (2003) also documented a failure of the infusion model of sustainability education. In 2000, the provincial education ministry removed a stand-alone Environmental Science course, opting instead to infuse elements of ecological education throughout the sciences. In their analysis of data after this switch, Puk and Behm found that very little ecological education was being taught in secondary schools. The authors argued that this suggests a policy failure: teachers were teaching according to guidelines that mandated very little content or time for ecological

education. Puk and Behm's resulting advocacy for the inclusion of environmental education as a separate course is echoed in a discussion paper from the UK (Scott & Reid, 1998). In their evaluation of policy shifts in England and Wales, Scott and Reid reflected that "it was, perhaps, a mistake for environmental education ever to have become so identified with, and dependent upon the success of, cross-curricular approaches" (1998, p. 216). Reporting on a more recent case study of Australian research, Kennelly, Taylor, and Serow (2011) noted that curricular content designated as sustainability-related often included no explicit reference to sustainability, across subjects such as English, Math, History, and Science.

As exception to the prior studies, an analysis of ESD policy implementation in the Icelandic curriculum demonstrated widespread incorporation of sustainability concepts across subjects (Jóhannesson et al., 2011). The authors used a holistic, seven-concept key to document how curricula responded to international policy mandates for ESD. Jóhannesson et al. (2011) suggested that the Icelandic approach to sustainability infusion effectively "provide[d] a space for teachers and schools to deal with issues of sustainable development" (p. 375).

In both the empirical and non-empirical studies reviewed, researchers noted the tendency of sustainability mandates to be associated primarily with science education. Several studies connected this to difficulties associated with interdisciplinary teaching, including teacher training approaches and subject-specific timetables (Bolscho & Hauenschild, 2006; Gayford & Dillin, 1995; Nixon et al., 1999). Reporting on results of a survey of 33 African countries, Vare noted that the majority of responding representatives (from both state and non-governmental organisations) equated environmental education with environmental science (1998, p. 13). Indeed, the early policy literature reviewed for the present study suggested a strong initial connection between science-based conservationism and environmental education. In a review of the first decade of the Council for Environmental Education in the UK, Wheeler reported that "[e]nvironmental education was thus conceived out of the aspirations of conservationists and educationalists to make people more aware of the natural environment" (1983, p. 10). In a paper discussing early contributors to environmental education, Gough (1997) contended that "[t]he roots of environmental education are in rational science" (p. 10), citing the influence of environmental education founder Bill Stapp, who occupied a number of high-level policy positions, including first director of the UNESCO-UNEP International Environmental Education Program. Gough describes how, under Stapp's lead, the Program issued a number of science-

based foundational statements on environmental education, which came to be broadly accepted and dispersed by an international community.

Despite overwhelming findings of environmental education implementation through science, a small numbers of policy studies reported on connections made between sustainability education mandates and social studies curriculum. In a report on implementation of the 1970 Environmental Education Act in the US, Hepburn and Keach (1974) evaluated uptake of environmental education in primary and secondary social studies curricula. They reported that environmental education mandates had little traction in this area, mainly due to traditional discipline-based teaching and inflexible timetables. Two decades later, Adara (1996) and Adedayo and Olawepo (1997) discussed incorporation of environmental education into social studies curriculum in Nigeria. The authors identified a faith in scientific progress and technocratic solutions to environmental problems among legislators and policymakers, which they suggested left little room for contributions to environmental education curriculum from the social sciences.

Several articles reported on approaches to sustainability policy that focused on the challenges of whole school implementation. The majority of these studies described policies of whole-school change attempted through a series of modest modifications and operating at the margins because of lack of appetite for greater transformation (Elliott, 1999; Lee, 1997; Nixon et al., 1999; Scott & Reid, 1998). One reason cited for implementation difficulties was low compliance due to policies being viewed as non-mandatory (Lee, 1997; McNaughton, 2007). For example, McNaughton (2007) described a mid-1990s Scottish policy approach to whole-school change, which envisioned this transition as progressing through stages to arrive at a whole-school cultural shift where “pupils and staff are both empowered to take initiatives and able to make active, participative responses in local, national and global issues” (p. 623). However, uptake of this policy initiative was not enthusiastic, in part related to an emphasis on standards and “back to basics” education, in which sustainability was deemed a fringe subject. Lee (1997) reported a similar result in Hong Kong, also citing lack of resources and professional development opportunities for teachers as factors in the lack of uptake. In contrast, Barth et al. (2012) describe the modest success of a participatory, whole school approach in Germany in their empirical evaluation of student attitudes toward consumption. Students demonstrated higher self-reported sustainable consumption behaviors, as well as higher measures of perceived

effectiveness of their own consumer choices, and perceived relevance of consumer knowledge gained while at school.

Teaching and pedagogy. Policy research on the teaching of sustainability education mainly focused on the extent to which policy mandates were successful in influencing teacher training, teacher knowledge and attitudes, or teacher decisions to incorporate sustainability-related content into their teaching. Conceptions of pedagogy, and questions of how sustainability ought to be taught, were largely absent from the policy literature reviewed until the 1990s, when these topics begin to be discussed in relation to discussions of educating for, in, and about the environment (Ferguson, 2008; Jóhannesson et al., 2011; Lee, 1997; Nam, 1995; Pace, 1997; Scott & Reid, 1998). Learning as “action research” or “action competence” is increasingly discussed in relation to education curriculum and policy in the later 1990s through 2013 (e.g. Breiting & Wickenberg, 2010; Elliott, 1999; Fontes, 2004). For example, in describing transitions in German educational policy, Scheunpflug and Asbrand (2006) compared two pedagogical strands associated with global education and sustainability education: action theory focusing on building solidarity, empathy, and a holistic world view; and systems theory focusing on complexity, abstract thinking, and self-organized learning for students. Other pedagogical approaches discussed in relation to policy texts or their enactment included inquiry-based (Clothey, Mills, & Baumgarten, 2010), citizenship (Adara, 1996; Iyengar & Bajaj, 2011; Jickling, Sauvé, Brière, Niblett, & Root, 2010), economic participation (González-Gaudiano, 1999), and Indigenous education (Mokuku, Jobo, Raselimo, Mathafeng, & Stark, 2005).

Kennelly, Taylor, and Jenkins (2008) examined the relationship between policy and pedagogy in a qualitative, interview-based study of eight teachers. Their analysis investigated pedagogical responses to whole-school sustainability policy, with the majority of teachers expressing teaching philosophies aligned with education for the environment. Nearly all teachers interviewed described their role as encouraging collective action, as well as personal responsibility, and emphasized the importance of teachers supporting and acting on student ideas. Kennelly et al. found that the success of whole-school policies was deeply linked to the pedagogical practices and ideologies of coordinating teachers. They conclude that “the fundamental ideas and practical procedures underpinning [whole school programs] should be incorporated into wider pre-service and in-service teacher professional learning” (p. 62).

A subset of articles described teaching as a weak point in sustainability education policy (Bolscho & Hauenschild, 2006; Nam, 1995; Posch, 1999; Puk & Behm, 2003). This was

variously articulated as: poor or absent policy in relation to teacher education (Bolscho & Hauenschild, 2006), vague pedagogical and curriculum sustainability mandates (Huckle, 2009), or low commitment on the part of teachers in policy implementation (Gayford & Dillin, 1995). Stimpson (1997) suggested that instead of clear policy mandates, environmental education relies on the “enthusiasm of teacher educators” (p. 355) for its success. In some settings, low perceived status of teachers and low financial compensation combined with time constraints, were found to prevent a focus on sustainability education (González-Gaudiano, 2007). Singh (1998) discussed the roles of teachers in reading and “refracting” curriculum policies in order to enact a critical environmental approach to formal education. According to Singh, “policies intended to effect educational innovation in Australia’s school curriculum ... must be read as being in a dynamic and continuing relationship with them” (p. 349). Singh identified a variety of policy readings undertaken by teachers, including resistance, adaptation, and re-making of policy meanings. He argued that educators must go beyond reading policy as critical engagement, and begin to re-write curriculum policy, through critique, strategic reappropriation, and creation of alternatives.

Competing policies. The reviewed literature suggests that sustainability education often exists within contexts where there are multiple policy discourses competing for primacy. Many authors described tensions between sustainability education and the perceived primary purpose of education: preparing students for examinations in core subjects (e.g. Gayford & Dillin, 1995; Gruenewald & Manteaw, 2007; Martina, Hursh, & Markowitz, 2009; Nixon et al., 1999; Scott & Reid, 1998). Huckle (2008) noted that when educational mandates focus on testing and performance this not only de-prioritizes sustainability education, but also, through a reliance on individual attainment and competition, discourages an ethic of environmental and social care.

Reviewed articles also noted increased pressure felt by educational bodies and institutions in keeping up with international competitors, particularly via student achievement in core subject areas such as math, science, and literacy (Kennelly, Taylor, & Serow, 2011; Puk & Behm, 2003). Two articles from the United States described how powerful standardized testing mandates, such as the federal “No Child Left Behind Act” (NCLB) eclipsed other educational concerns, including a focus on sustainability (Gruenewald & Manteaw, 2007; Martina, Hursh, & Markowitz, 2009). Gruenewald and Manteaw (2007) suggested that teachers are thus left with two options in the face of heavy imposition of standards: resistance or accommodation. Martina, Hursh, and Markowitz (2009) described national-level implementation of a newly developed environmental health curriculum, which they contend was undermined by both state policies and

the federal NCLB. In their survey of site-specific implementation, the majority of respondents indicated that standardized testing interfered with the implementation of sustainability education. Several projects also reported on accommodation tactics, such as incorporating the curriculum into Grades 2 and 5, the only grade-levels where state-level testing is not mandated.

Some studies put forward policy solutions for sustainability education to better compete within this policy environment, such as integration of sustainability into related policies (Renton & Butcher, 2010), or the provision of dedicated sustainability-focused staff at ministries of education (Courtenay-Hall & Lott, 1999). Renton and Butcher (2010), for example, evaluated the integration of sustainable development into child and youth-related policy frameworks in the UK. Other than offering general support, they found that many documents failed to integrate sustainable development principles, most conspicuously in policy frameworks with mutually supporting goals, such as England's child health strategy (p. 164). Renton and Butcher argue that not only should sustainability be embedded within all policies affecting children and youth, but sustainability education should include opportunities for youth participation in local and national government.

Marginalizations. A fourth and final focus identified in the reviewed articles was that of “marginalizations,” or in other words, research which focused on which perspectives and knowledge are centered or marginalized, and by what mechanisms, in conceptualizations and enactments of sustainability education policy. Grounds for marginalization discussed across the research papers included a focus on cultural tensions; North-South divisions; and hierarchies of policymakers, researchers, and practitioners in decision-making.

In terms of roles in the policy process, Stevenson (2007) noted that international meetings tend to privilege the voices of policymakers and academics, at the expense of practitioners. Such exclusion is also noted in the development of state-level policies and resources (Courtenay-Hall & Lott, 1999; Scott & Reid, 1998). Stevenson contended that the products of international meetings (e.g. declarations, proceedings) obscure sites of struggle, not only of the discourses themselves, but also of different camps of environmental, development, and educational policymakers. Multiple authors interrogated tensions between the claims to universality of sustainability declarations, and the exclusion of various voices and cultural groups (e.g. González-Gaudiano, 2006; Mucunguzi, 1995; Stevenson, 2007). González-Gaudiano (2006) noted that at international conference venues where such statements are drafted, representatives are predominantly from industrialized nations. He cited as evidence the UNEP International

Environmental Education Program, which spanned 20 years and “only valued and, therefore gave voice to, the experiences and perspectives of representatives of developed countries” (293).

In relation to marginalizations enacted through globalizing processes, relatively few papers examined economic competitiveness or neoliberalism in the context of sustainability education policy (for exceptions see Mannion et al., 2011; McKenzie, 2012; Sahlberg & Oldroyd, 2010). McKenzie (2012) contends that critical examination of universal education mandates, such as the UN Millennium Development Goals must be understood within a neoliberalized global environment. Using a Saskatchewan-based critical policy case study, McKenzie documents how the 2009 UNESCO Bonn Declaration was interpreted in relation to local and regional contexts. She writes that “slippage from an emphasis on “environment, conservation, and sustainability” to “education for sustainable development” at the level of provincial educational policy seems worryingly comfortable and easy” (p. 173). Within a neoliberal framework, education for sustainable development can shift focus from the interdependent domains of environment, society, and economy, to simply being able to check off the “ESD” box anytime educational activity pertaining to any one of these three areas is undertaken (McKenzie, 2012).

Several articles included in our review examined the contexts of sustainability education policy in low-income countries, including those with histories of colonization. In high-income countries, the success of sustainability education was variously linked to policy uptake by government, teacher training and enthusiasm, presence and availability of resources, and participation in initiatives like the UN DESD. However, in many national contexts, under-resourcing of public education, and therefore access to basic schooling, are ongoing challenges (González-Gaudio, 1999; Vare, 1998). Several authors noted that sustainability education cannot be assumed to be universally desirable; even as definitions and practices may be broadening, and wide space given to context-dependent interpretation, colonial histories are impossible to escape. Schooling, including for environment and sustainability, has displaced forms of traditional knowledge and its lines of transmission (Mucunguzi, 1995; Vare, 1998).

In some contexts, policy for environmental education has been associated with forms of land conservation, in which Indigenous peoples and other citizens have been displaced and excluded from their land (Bak, 1995; Mucunguzi, 1995). Mucunguzi (1995) describes environmental education as representing a form of colonial education, which has effectively written over more holistic and situated traditional forms of environmental education.

Research Gaps and Implications

This review included policy research at a regional (e.g. Iyengar & Bajaj, 2011; Puk & Behm, 2003; Stimpson, 1997), national (e.g. Adedayo & Olawepo, 1997; Gough, 2011; Nam, 1995) and international scale (e.g. Chapman & Aspin, 2013; Lotz-Sisitka, 2009). More local-scale policy research (e.g. within a local school division or school) was absent from our review, which suggests that: (a) local-scale sustainability education policy is under-produced and/or under-studied; (b) this research is being reported in venues other than peer-reviewed journals; and/or (c) our search methods were biased against detection of local policy research (e.g. such research was not identified with the keywords searched). We suggest that all three may have contributed to a lack of local-scale policy research in this review.

As discussed in the findings, many regions were under-represented across this review, including South America and Northern Africa. We suspect that in some cases, policy research is being undertaken and communicated in venues other than English-speaking journals. In the interest of avoiding ethnocentrism and expanding the scope of the field of sustainability education research, it may be useful for the research field to discuss means of translating research articles.

The review spanned four decades of research into the policy contexts of sustainability education. The 215 articles represented 71 countries, in which policy was examined using increasingly diverse methodologies. Nevertheless, in concluding this review we echo Læssøe, Feinstein, and Blum (2013) in calling for increased engagement with policy research within the field of sustainability education. In particular, we propose greater research attention in the following three domains: critical policy theory and methodology; issues of intersectionality and sustainability education policy; and climate change and education policy. These recommendations arise from trends that we documented through thematic analyses (climate change and education policy), as well as from absences we noted during the process of coding and writing (critical policy research, intersectionality). A common thread across our recommendations is for increased empirical engagement within sustainability and environmental education policy research.

While methodological diversity in sustainability education has increased from an initial focus on survey-based research to a more recent encompassing of case study and multiple-methods, we observed a general inattention to developments in critical policy research more broadly. These developments include, foremost a rejection of positivist frameworks that assume

policy, and therefore policy research, to be a neutral process of problem identification and solution. Instead of objectively determining “what works,” critical policy research understands policy processes as complex, with multiple actors intervening in ways that influence what issues are identified as policy problems, what solutions are available, and how these policy solutions are championed, borne out, resisted, or subverted in practice. Over the last three decades, strands within education policy research have responded to this messier understanding of policy, focusing not only on policy texts, but also on the locations of policy-making (e.g. Pinto 2012) and policy enactment (Ball, Maguire, & Braun, 2012; Braun et al., 2011). Empirical research articles included in this review tended to focus on either textual analysis or policy enactment, neglecting systematic examination of policy origins or development, and of broader interactions among various aspects of the policy process.

Research into policy enactment suggests that the ways in which policy is practiced and examined can be interpreted in relation to contextual factors such as material resources, professional cultures, competing policies, and school history (Braun et al., 2011; Thrupp & Lupton, 2006). Recent work on policy tensions, mobility, or networks and actors (Ball & Junemann, 2012; Heimans, 2012; Hursh & Henderson, 2011; McKenzie, Bieler, & McNeil, 2015) suggests directions for analyses that provide greater understanding into the situated contexts of policy development and enactment. As policy researchers, we are also intrigued by a theoretical re-orientation toward the material (e.g. Fenwick, Edwards, & Sawchuk, 2011; Tuck & McKenzie, 2015). “New materialist” approaches advocate theoretical understandings that center on socio-material contexts and an attention to the effects of non-human actors. With histories of place and land-based pedagogical research, sustainability and environmental education research is well positioned to contribute to discussions of “post-human” materialities and to disrupt the dominance of human-centric policy analysis.

In their call for “reinvigoration” of critical policy research, Webb and Gulson (2015) note the challenges of using research to “critique and change political structures and practices” (p. 170). We note within the articles reviewed an inattention to how policy research itself might have greater political leverage. Despite ontological and methodological tensions, we believe that critical policy research must include engagement with research fields more oriented toward policy development and solutions and with generative political action (e.g. Davies & Nutley, 2008; Rickinson, Sebba, & Edwards, 2011; Sellar, Savage, & Radhika, 2014). Research that effectively influences policy outcomes has been suggested to involve policymakers and

practitioners from the outset (Edwards, Sebba, & Rickinson, 2007; Stevenson, 2013). According to Edwards, Sebba, and Rickinson (2007), this entails a shift in locus of control from university-driven project development to including policy “users” as co-researchers, supported by the creation of “sites of mutual learning” where knowledge flows are multi-directional (p. 652).

In the final section of our thematic analysis, we discussed various forms of marginalization addressed in the policy literature, including elitism in policy development, neoliberalism, and colonization. Intersectional analyses, which explicitly address the interaction between categories of marginalization (e.g. among environment and race, gender, class, or other forms of oppression), were largely absent from the articles reviewed. Articles that did address intersecting marginalities tended to discuss the difficulties of universalized mandates for sustainability education, particularly in the context of education for sustainable development. Relatively few papers examined the tensions of racism and classism (Bak, 1995) or colonialism (Gough, 1997; Mucunguzi, 1995) in relation to sustainability education policy. We noted a dearth of policy research that engaged with issues of gender or environmental justice, particularly within empirical articles. We emphasize the need for policy research that incorporates in-depth examination of policy contexts in relation to issues of justice and intersectionality. Intersectional and related approaches to policy research have been growing, with development of methodological tools by health policy researchers (Hankivsky, 2012; Hankivsky et al., 2014). Using participatory, multi-sector stakeholder consultation, Hankivsky et al. (2014) developed an Intersectionality-Based Policy Analysis framework comprising core guiding principles and questions. According to the researchers, this framework “captures the different dimensions of policy contexts including history, politics, everyday lived experiences, diverse knowledges and intersecting social locations; and ... generates transformative insights, knowledge, policy solutions and actions that cannot be gleaned from other equity-focused policy frameworks” (p. 2). We propose that similar frameworks could be adapted for policy research into sustainability education. Recent work in place-based and land-based education (e.g. Tuck & McKenzie, 2015; Tuck, McKenzie, & McCoy, 2014) points toward more just, ethical, and decolonizing ways of practicing and researching sustainability education. A land and place-based framework for educational policy research has yet to be articulated; however, increased engagement with intersectional, Indigenous, and materialist methodologies suggests new ways of imagining policy research. Within the field of critical policy research, Ball (1994) noted that equity was an under-theorized area of policy research and proposed extending an initial model of

the policy cycle (Bowe & Ball, with Gold, 1992) to include the contexts of political strategy and outcomes. Relatively little research to date has attempted to employ this model to empirical policy research (but see Gulson, 2011), including in sustainability education policy research.

An additional finding of this review was the absence of a focus on climate change in articles published prior to 1995, and the relatively low engagement overall. Though the majority of recent articles invoked climate change in some capacity, it appears that sustainability education policy research is just beginning to respond to climate change concerns (e.g. Bangay & Blum, 2010; Feinstein et al., 2013b). As climate change and associated extreme weather events increasingly challenge human health, economic activity, and survival, it is expected that greater research efforts will be directed toward the development of more thorough approaches to climate change adaptation and prevention through education. The response and responsibility of education toward climate change goes beyond simple “environmental and sustainability education as problem-solver” narratives (Van Poeck & Lysgaard, 2016). Climate change effects are, and will continue to be, variegated and unpredictable, and responses from education policy will require innovation of both transversal and local approaches. Education systems will grapple not only with educating for climate change mitigation and adaptation, but also with questions of how education policy should respond to climate inequities, such as differential historical responsibility for climate-modifying emissions. Educational directives must mandate more than knowledge of climate change issues if local and global adaptation is to be taken seriously. Climate change adaptation, including socio-economic and health crises, and loss of place with associated emotional implications for students and their communities, must be addressed in affective, tangible, and action-oriented ways. Such challenges will require engaged, political, practical, and imaginative forms of education policy research.

In closing, this review is concerned with the state of policy research in sustainability education and argues for increased empirical engagement with policy origins and enactment. We documented temporal, geographic, and thematic trends in policy research across nearly four decades. We described temporal spikes in published policy research occurring in the mid-1970s, late 1990s, and after 2005. We also documented geographic under-representation of regions and countries, including Africa, South and Central America, Eastern Europe, and most of North and West Asia. Through in-depth thematic analysis, we documented patterns in research foci, including enduring concerns related to the instrumentalism of policy drivers, to the larger contexts of competing research paradigms and competing (educational) policy paradigms, and

the focus on teaching and learning directives. We have argued that policy research in sustainability education must attend to the challenges of theoretical and methodological rigor, incorporate intersectional and justice-based frameworks, and more fully address climate change. We have also argued for greater consideration of how policy research engages research “users,” including policymakers, in order to function more effectively as forms of public scholarship (McKenzie, 2009); informing, critiquing, and mobilizing policy development and enactment in sustainability education.

Transition

The previous chapter presented a systematic analysis of policy research within the field of environmental and sustainability education. Overall findings indicate that empirical policy research within the field remains scant and dominated by a few countries. Though several articles addressed Canadian policy contexts, these were limited to the provinces of British Columbia (BC) and Ontario; there existed no comparative analysis of education policy across Canadian contexts. Chapter 3 addresses this gap by providing a comparative analysis of ESE policy mobility across six Canadian provinces and territories, through analysis of provincial policy texts.

Chapter 2 also identified a general disconnect of ESE policy research with developments in critical policy studies and proposed potential theoretical trajectories for future research, including intersectional policy analysis, materialist approaches, and policy enactment. In the chapter that follows (Chapter 3), we employ a policy mobilities analytic to examine ESE policy texts across provincial ministries of education.

CHAPTER 3: The global ESD assemblage in Canadian context: ESD, EE, and Indigenous education across six provinces and territories

Introduction

Since the 1970s, global Environmental and Sustainability Education (ESE) policy initiatives have been spearheaded by the United Nations, with a leading role initially by UNEP (United Nations Environment Programme), then UNESCO (United Nations Educational, Scientific and Cultural Organization), and most recently, in relation to the UN Sustainable Development Goals (SDGs). An early declaration at the 1972 UN Conference on the Environment called for “the establishment of an international programme in environmental education... encompassing all levels of education and directed toward the general public, in particular the ordinary citizen...with a view to educating him as to the simple steps he might take within his means, to manage and control his environment” (sic, quoted in Stapp, 1976, p. 20). The 1980s-90s marked a shift in UN ESE paradigms, from environmental education to Education for Sustainable Development (ESD), followed by the Decade of ESD (2005-2014) and subsequent Global Action Programme on ESD (2015). In 2015, the SDGs were also launched, including a focus on Education for Sustainable Development in Target 4.7 (UN, 2015). In contrast with core educational subjects, ESE in all these versions has typically remained an adjectival area of policy and curriculum development in national and subnational policy contexts (Adedayo & Olawepo, 1997; Gayford & Dillin, 1995; Puk & Behm, 2003; Scott & Reid, 1998; Vare, 1998). It is perhaps because of weak national investments that ESE policies have been strongly influenced by UN programs in some countries, and subsequently ESE policy research has mainly focused on international to national policy uptake, with little attention to subnational and local contexts (Aikens, McKenzie, & Vaughtner, 2016; McKenzie & Aikens, forthcoming).

In their reporting on a comparative study of Education for Sustainable Development (ESD) and Climate Change Education (CCE), Feinstein and colleagues (2013) note the challenges of characterizing national approaches to sustainability education, particularly in contexts with semi-autonomous subnational states. In Canada, this challenge is exacerbated by the federated system in which each province or territory retains autonomy over its own

educational policy-making processes. Canada's polycentric approach to education policy, however, also affords the opportunity for comparative analysis of how ESE has been engaged across subnational jurisdictions. This paper examines the uptake of environment and sustainability into education policy in Canada, through analysis of policy texts across six provinces and territories.

In the following section we further outline the underlying theoretical framework and analytical methods, including justification for a policy mobilities analytic of global education for/about sustainability.

Policy assemblages, mobilities, and mutations. Policies are mobilizing with greater frequency and velocity than ever before. Peck and Theodore (2015) describe a "fast policy" regime where "policies that work" spread rapidly across regional and national boundaries. This borrowing of what are viewed as best practices within "compressed reform horizons" is facilitated by the increased influence of intermediaries, for example, policy entrepreneurs who push through particular ideas (Peck, 2011). As policymakers find themselves facing short timelines for reform, they begin to look for sure bets: "off the rack" policies that have been tried and tested with apparent success elsewhere (Temenos & McCann, 2012). Such policies can have important political ramifications: they operate under unspoken agreements about the efficacy of market solutions; they define what problems are pressing as well as possible solutions; and they are adopted through a smoothing process of constructing comparable contexts between policy origin and destination (Temenos & McCann, 2012).

Recently, researchers in education policy have suggested that a policy mobilities approach might support analysis of fast policy in education, including via discussions of policy networks (Ball 2016), policy conflict (Aikens & Hargis, 2019), vehicular ideas and affect (McKenzie, Bieler, & McNeil, 2015; McKenzie, 2017), and particular methodologies (Gulson et al., 2017). As McKenzie and colleagues (2015) note, the turn toward mobilities "is less defined by any overarching theoretical orientation than by a renewed empirical sensitivity to the movement of materials and ideas" (p. 321).

We understand ESD as a case of fast policy that has been mobile globally and within Canada (Peck and Theodore, 2015). Reorientation of public education systems toward sustainability requires a significant system overhaul, and a move away from traditional academic

achievement, and, more recently, global competition and innovation⁹ (Engel & Frizzell, 2015; Meyer & Benavot, 2013; Rizvi & Lingard, 2010). This reorientation was intended to be accomplished globally within a relatively short timeline. In 2002, the United Nations General Assembly adopted resolution 57/254: to implement a worldwide Decade of Education for Sustainable Development from 2005-2014. The UN International Implementation Scheme for the Decade (2005) described the initiative as “a complex and far-reaching undertaking. The environmental, social, and economic implications are enormous and touch many aspects of life of the world’s population” (p. 6). National governments were “encouraged” to integrate sustainable development into all aspects of education and learning, including public schooling systems. As the decade progressed, countries submitted mid-decade and final reports summarizing ESD activities and achievements. Since the end of the Decade, the global promotion of ESD has continued through the Global Action Programme (GAP) for ESD (2015-2019, first phase) (UNESCO, 2014).

Despite the ascendance of ESD in international policy arenas, it has not been uniformly mobilized across national/subnational contexts. From inception, ESD has sustained critiques related to perceived instrumentalism and anthropocentrism (e.g., Jickling, 1992; Kopnina, 2012; Sauvé 1996). In many places, pre-existing priorities and terminology of “environmental education” have persisted as a preferred descriptor, particularly in countries with historically strong environmental education communities, such as the United States, the United Kingdom, and Canada (Stevenson, 2013). Thus, responses to international ESD mandates, including the UN Decade of Education for Sustainable Development, have not necessarily conformed to straightforward adoption-and-implementation models.

ESD as a global policy assemblage. As part of our policy mobilities framework, we conceptualize ESD as a global policy assemblage, which has mobilized through complex networks of policy actors, international events, policy discourses, and policy texts themselves. An assemblage can be considered a relational and contingent entity, comprised of heterogeneous components which are brought together under particular conditions (DeLanda, 2016; Ong & Collier, 2005; Savage, 2019). This theoretical framing draws on the work of Ong and Collier (2005), who describe global phenomena as having “a distinct capacity for *decontextualization*

⁹Some might argue, however, that ESD falls within a paradigm of competition and innovation and that such a focus can lead to technological solutions that offer up a more sustainable future.

and recontextualization, abstractability and movement, across diverse social and cultural situations and spheres of life” (p. 7, italics added). This aligns with previous policy mobilities research in education which recognized “sustainability” as a vehicle idea, able to move through diverse contexts by virtue of its “hermeneutic and contextual flexibility” (McKenzie et al., 2015, p. 320).

An assemblage conceptualization recognizes the contingency and variegation involved in policy mobility (McCann & 2012; Savage, 2019). Through processes of decontextualization and recontextualization, the heterogeneous components that comprise a global assemblage form new arrangements as they “arrive” in new places. Some assemblage components may be emphasized at the expense of others, while others may be rejected entirely. As a global assemblage, ESE might consist of (but not be limited to) the following components: discourses of education for sustainable development (ESD) and environmental education (EE); actors such as policymakers, teachers, students, and community members; material objects such as policy texts themselves; and practices such as teaching or administrative procedures.

In this analysis, we focus on the **heterogeneous components enrolled in ESE policy texts** and undertake a textual analysis of provincial policy documents. Through conceptualizing provincial policies in relation to a global ESD policy assemblage, we emphasize that policies are not “internally coherent” wholes that “emerge fully formed in one particular place and then sometimes move, whole and unchanged, across space” (McCann & Ward, 2012, p. 328). Instead, policy texts represent particular *instances of recontextualization of a global ESD assemblage*, with different arrangements of component parts.

Methods

This work exists as part of a larger project investigating the relationship between policy and practice in ESE, through the Sustainability and Education Policy Network (SEPN). SEPN undertakes policy research in international, national, and regional education systems to provide rigorous, comparative evidenced-based understandings of policy, and enable deeper responses to sustainability (sepn.ca). This analysis is part of a larger, coordinated project addressing the gap in comparative ESE policy research in K-12 education in Canada.

In our operational definition of *policy texts*, we draw on work by Taylor and colleagues, who define public education policies as those “which are made on behalf of the state by its various instrumentalities to steer the conduct of individuals, such as teachers or students, and organizations, such as schools or universities” (Taylor, Rizvi, Lingard, & Henry, 1997, pp. 1-2).

We therefore consider provincial education policy as any high-level text or mandate produced by a ministry of education.

Policy document collection. Our primary method of document collection was a manual survey of publicly available policy material from all 13 provincial and territorial ministries/departments of education¹⁰. In the following sections we will use the term “ministry of education” except where referring to specific provincial/territorial contexts where another term is used. We collected two types of provincial education policies in relation to this analysis:

- (1) General documents that evidenced incorporation of sustainability into broader ministry of education priorities, including mission statements and essential learning/cross-curricular competency documents; and
- (2) Sustainability-specific policies in which sustainability was defined as including, at minimum, considerations of the environment¹¹. Only those sustainability-specific policies which addressed governance and/or curricular priorities are included in this analysis, in order to have the widest representation of comparable texts.

Six of 13 provinces and territories had developed sustainability-specific policies addressing either governance or curricular priorities, yielding a combined 17 policies, of which 11 were sustainability specific policies. These 17 policies comprise the dataset for the analysis presented in this paper. None of the remaining seven provincial or territorial ministries of education had developed sustainability policy¹². The majority of policies that inform this analysis were authored after the advent of the decade of ESD; however, one policy in each of Manitoba and the Northwest Territories (NWT), predate the decade¹³ (Manitoba Department of Education & Training, 2000; NWT Department of Education, Culture & Employment, 1996).

Policy analysis and identification of policy clusters. All policy texts were coded using the NVivo 11 qualitative data analysis platform. Our analytic process was iterative, involving

¹⁰ Manual website surveys were complemented by using Ministry-specific search engines, using the Boolean search terms “sustain*”, “environment*”, “ecological”, and “green.” For further details of these searches, refer to Beveridge, McKenzie, Aikens, and Strobbe (in press).

¹¹ This encompassed such terms approaches as Education for Sustainable Development (ESD), sustainability education, Education for Sustainability (EfS), environmental education, and Indigenous approaches.

¹² The Yukon territory had developed an ESE scoping document of activities undertaken in other ministries of education; however, this document which did not result in further policy development.

¹³ We retained these documents in the analysis as we judged them to be foundational policy documents for ESE in their respective contexts.

multiple stages of document analysis. The first stage focused on the development of a structured codebook through inductive coding; the second included identification of three policy clusters through assessment of inductive coding patterns; and the third stage involved application of inductively developed comparative categories across the three policy clusters. Each of the three stages of are described in more detail below.

We undertook an initial round of inductive coding using a subset of documents in order to create a structured codebook. This codebook was developed by three coding analysts, with subsequent review by three additional researchers. The entire set of documents was then coded using the codebook, with occasional refinements based on qualitative intercoder reliability assessments. We then performed several rounds of analytic “querying” with a focus on assessing patterns in the data across province and policy type, according to the inductive coding structure. We used the matrix coding query function in NVivo to assess coding frequency across documents, as well as coding content.

The second stage of analysis focused on the identification of **three policy clusters**: a sustainable development policy cluster, an environmental education policy cluster, and an Indigenous education policy cluster. These policy clusters emerged as distinct groupings, with differing themes and orientations to ESE evident across each cluster. As a cross-check of our findings, we examined word frequencies across all policies, as well as policy titles, and framing and closing statements of each policy. This confirmed our assignments of policies to each cluster, particularly with respect to consistency across documents within a province.

After the identification of each policy cluster, we undertook a comparative analysis of the following ESE components, which were derived from the inductive analysis and demonstrated consistent patterns of divergence across policy clusters. These included: 1) **Orientations to sustainability**, which focused on defining statements about the nature of sustainability, and the orientation towards sustainability evidenced by the documents. This included, for example, engagement with economic sustainability, or positioning on a spectrum of anthropocentrism to biocentrism. (2) **Sustainability action** refers to statements about how sustainability is achieved/engaged in a particular setting, i.e. within the provincial educational system, within regional educational authorities (e.g. school districts), within schools, by communities, and/or individuals. This included references to both internal and external stakeholders and to student action for sustainability. (3) **Teaching and learning** included statements about the development and implementation of sustainability-related teaching content and pedagogical methods.

Findings

In this section, we present our findings in relation to three identified ESE policy clusters, each associated with the analyzed policies from the following provinces and territories (Figure 3.1):

- (1) Education for Sustainable Development in Québec and Manitoba;
- (2) Environmental education in Ontario and British Columbia (BC); and
- (3) Indigenous education in Nunavut and the Northwest Territories.

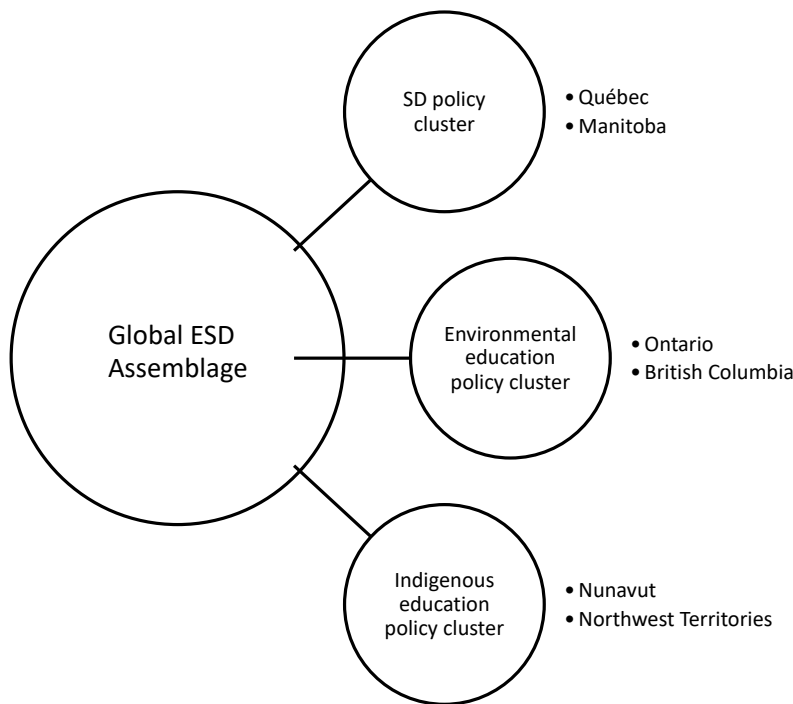


Figure 3.1. Representation of three ESE policy clusters across six provincial and territorial contexts, in relation to a global ESD assemblage.

Aside from the northern territories, geographic proximity does not appear to have influenced uptake of a particular form of ESE. Furthermore, the policies authored by provincial ministries of education (i.e., excluding the two territories) contained no references to policy or practice in other provinces, effectively presenting as silos of policy production. This does not necessarily indicate that these policies are free of entangling co-influences. For example, despite the absence of a federal bureau of education in Canada, there exists a more loosely networked Council of Ministers of Education from across the provinces and territories (CMEC) that meets

regularly and drafts non-binding agreements on educational priorities. In 1999, a CMEC statement on ESD was lead-authored by the representatives of the Manitoba Department of Education and Training, an early adopter of the ESD approach. Manitoba has continued to lead much of Canada’s work in ESD, and this has likely shaped the ways in which ESD has moved (or not) through other provincial education systems in Canada.

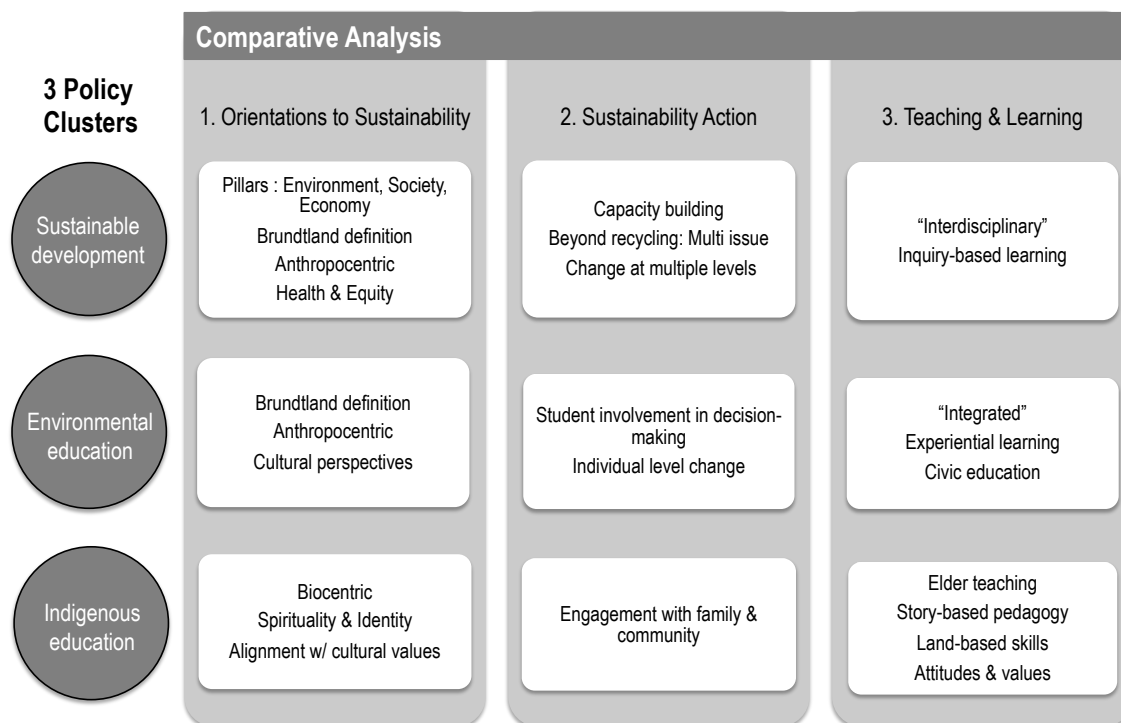


Figure 3.2 Comparative analysis of three categorical components of ESE, across three policy clusters.

Figure 3.2 summarizes the similarities and divergences across the three policy clusters in relation to the components of (1) orientations to sustainability, (2) sustainability action, and (3) teaching and learning. The following sections examine how these components have been taken up within each policy cluster. Despite distinct subthemes emerging in both “sustainability action” and “teaching and learning” categories, these two categories were frequently interwoven in the policy texts we examined; for example, student action was discussed alongside pedagogical approaches such as inquiry and experiential learning. Our analysis of sustainability action therefore overlaps somewhat with teaching and learning themes, particularly with respect to student learning and student action for sustainability.

As a result of repeated reference of the three (or four) sustainable development pillars, the term “economy” and its derivatives appeared much more frequently within this policy cluster. In fact, this group of policies contained five times as many references to economy than all other policies combined (Environmental education and Indigenous education policy clusters). In other words, there was a relative privileging of the economic component of sustainable development in relation to other clusters. Another feature of this three pillars orientation to sustainability was consistent linking of the words “environment,” “economy,” and “society,” such that one rarely appeared without the other two. This repetition of social, environmental, and economic reinforced the concept of mutual interdependence without recognition of the asymmetry of the relationship; economic systems are embedded within societies, which, in turn are completely dependent on the environment for sustenance. Within these texts, the environment was not accorded stand-alone discursive “space” by way of its consistent rhetorical attachment to the social and economic pillars. The implication created here was that humans must be included in order for a system to enjoy sustainability.

Increased **focus on the economic component** of sustainability opens up both greater risk and opportunity. Student advocacy for a “strong economy,”¹⁴ development of student “entrepreneurs,¹⁵” or inclusion of financial literacy as part of sustainability education, risks providing justification for maintaining the economic status quo (McKenzie, 2012; McKenzie et al., 2015). When a “strong economy” is undefined, this may be interpreted as support for current Canadian economic conditions, including government subsidies and support for extractive industries. A focus on financial literacy education in and of itself may encourage educational “box-checking” whereby ESD is considered accomplished by addressing any one of the three pillars (and ignoring the fundamental pillar of environment) (McKenzie, 2012). However, an opportunity is also presented here, that in addressing the economy as part of ESE, the concerns of economic justice and unfettered economic growth may be addressed. One of the policies

¹⁴ According to one Manitoba policy, as part of developing sustainability knowledge, skills, values, and practices, students will be enabled to “advocate for a strong economy and for government policies that support a strong economy” (Manitoba Department of Education and Training, 2000, p. 11)

¹⁵ The preface to the Québec sustainable development policy described educational systems as producing “citizens, workers, and entrepreneurs” (Québec Ministry of Education and Higher Education, 2008, p. 5, translated from French).

provides support for these kinds of openings, by discussing equitable resource access and promoting student advocacy in this area (Manitoba Department of Education & Training, 2000

Overall, the ESD-focused policies demonstrated a **human-centric orientation to sustainability**, with a focus on conservation for the benefit of human wellbeing; the concept of inherent value of the rest of the biosphere was largely excluded. It is important to note, however, that there are exceptions. For example, in one policy with a strong human-centric orientation, more biocentric viewpoints are also presented, for example: “equity is essential to the attainment of sustainability. This includes equity among nations, within nations, *between humans and other species*, as well as between present and future generations” (Manitoba Department of Education & Training, 2000, p. 7, italics added).

The sustainable development policy cluster also included a strong focus on “resources” and thus a downplaying of the value and agency of nonhuman life. These policies included repeated references to sustainability as the “conservation of resources,” with a vision of earth/nature/ environment primarily as a container for these resources. This reflects what Sauvé, Berryman, and Brunelle (2007) refer to as a “resourcist worldview,” in which “the environment is perceived as a pool of resources and is associated with various problems of resource management. The idea of a living world with an intrinsic value is overshadowed” (p. 273). A **resourcist view** sees all nonhuman living things as inert and passive, consisting of resources which should be managed more carefully (environmental sustainability) in order to maintain economic systems (economic sustainability) and human quality of life (social sustainability).

The term “resource” assembles multiple representations, including the issue of access: *who* uses *what* resources *when* and through *what means*, as well as historical and future trajectories of resource use. We note that the emphasis on resource use within the sustainable development policy cluster included expressions of equitable resource access, over-consumption, and other inequities of economic and social systems. For example, policies within this cluster included specific commitments to “poverty reduction and prevention” (Québec Ministry of Education and Higher Education, 2008, p. 14) and statements such as: “A sustainable economy is one that provides equitable access to resources and opportunities. It is characterized by development decisions, policies, and practices that respect cultural realities and differences, and do not exhaust the Earth’s resources” (Manitoba Department of Education & Training, 2000, p. 6).). As these policy texts are brought into the contexts of practice, conceptions of resource access necessarily articulate with educators’ personal experiences and convictions, as well as

surrounding social, economic, and material contexts. Such expressions could provide legitimacy to teachers' enactments of equity-focused pedagogies. This is one of many possible outcomes.

Sustainability action in the SD policy cluster. Relative to the other two policy clusters, the SD policy texts emphasized the component of **action**, a component also indicated within international ESD mandates. These policies emphasized engagement through capacity building, which was defined as a critical element of systemic change for sustainable development. Capacity-building was articulated as activity beyond professional development, as it encompassed both stakeholders embedded within the school system, such as teachers and regional district staff, and those considered without the system, such as families and communities. Capacity building was described as a holistic method of achieving system-wide, **whole school** change. This was not simply about preparing excellent classroom teachers but rather building capable participants engaged in all aspects of sustainability transformation, from school operations to development of regional sustainability networks. Alongside capacity-building, collaboration with community members and organizations was identified as part of achieving this whole-system change.

Across three of the four policies in the SD cluster, **student action for sustainability** was conceptualized through a broad array of issues. This included not only school-based projects in waste diversion and water/energy conservation projects, but also a focus on addressing broader issues related to public transportation and societal patterns of consumption and consumerism. Though student action was most frequently depicted as opportunity for individual behavioral change, examples of outcomes also included action projects targeting change at the societal or governmental level. According to this policy cluster, appropriate societal-level student sustainability action included lobbying local governments and organizing community projects (Manitoba Department of Education & Training, 2000).

Teaching and learning in the SD policy cluster. The student action component aligns with pedagogical approaches advocated in these policies: **inquiry and problem-based learning**, including student-directed learning projects. Overall, the role of teaching, and of teachers, was less emphasized relative to the other two policy clusters, even in the portions that describe appropriate sustainability action projects.

As an example of the reduced pedagogical focus, the fourth policy within this cluster and the only policy from the province of Québec, demonstrated a substantially reduced focus on the teaching and learning component of ESE. Rather than a goal of embedding *Education for*

Sustainable Development in curricula, the first objective of this policy was to “increase knowledge of the concept and principles of sustainable development and encourage the sharing of experiences and skills [amongst staff]” (Québec Ministry of Education and Higher Education, 2008, p. 9, translated from French). In this case, teaching and learning for sustainable development was entirely devolved to local school division authorities, with the ministerial purview ostensibly defined as “greening” administrative procedures and infrastructure.

Overall, the SD policy cluster reflected several key aspects that have been attributed to ESD in the research literature, including increased attention to the economy, and to action for sustainability (Huckle & Wals, 2015; Jickling & Wals, 2008; Sauvé, Berryman, & Brunelle, 2007). By attending to the economic component of sustainability, these policies could provide opportunities to address unsustainable development and overconsumption. Concerningly, the policies largely failed to identify root causes of economic unsustainability, and though diverse sustainability actions projects were identified, there was less attention to the pedagogical processes involved in teaching for sustainability.

Environmental education policy cluster. We now turn toward policies that demonstrated a focus on the terminology and priorities of environmental education. In the provinces of BC and Ontario (represented by 2 and 3 policy texts), ESE was recontextualized and formalized in policy, respectively, as “environmental learning” and “environmental education.” Figure 3.4 provides a representation of the key terms used throughout this policy cluster, through a word frequency cloud. The focus on “students” within this cluster is discussed with respect to teaching and learning, as well as sustainability action.

which students could develop loving relationships. One policy emphasized the pitfalls of anthropocentrism and encouraged humility as a key ingredient of sustainability:

One aspect of the human world view that has contributed to many of our environmental problems is the idea that nature should be controlled by humans. Humility can help us understand how we can live in balance with nature and how individual actions can make a difference. (British Columbia Ministry of Education, 2007, p. 10).

This cluster also emphasized the role of education in developing appreciation for nature through fostering affective connections and recognizing “the resilience, fragility, and beauty of nature and develop[ing] respect for the place and function of all living things in the overall planetary ecosystem” (Ontario Ministry of Education, 2009, p. 27).

Teaching and learning in the environmental education cluster. Environmental education policies emphasized the role of education in preparing students as citizens, leaders, and members of society. This was outlined as developing the appropriate knowledge, skills and attitudes to participate as environmentally literate citizens; for example, in order to contribute to a “prosperous, cohesive society” (Ontario Ministry of Education 1994, 2009). Despite its frequent invocation, however, conceptualizations of civic education were most often limited to statements emphasizing its importance in education. When specific pedagogical examples and projects were invoked, these mainly included change at the individual level, promoting individual behavior change and developing in students the capacity to make personally responsible environmental decisions.

In fact, the conceptualization of “student” across environmental education policies contained two dominant but competing expressions: the student as “**future citizen**,” and the student as **current stakeholder**. In these policies, schools were depicted as sites for molding of responsible *future* citizens, rather than sites for *current* collective action. For example, one policy declared that “[t]oday’s students will shape the world of tomorrow” (Ontario Ministry of Education, 2009, p. 7), and emphasized the role of schools in “preparing our young people to take their place as informed, engaged, and empowered citizens *who will be pivotal* in shaping the future of our communities, our province, our country, and our global environment” (Ontario Ministry of Education, 2009, p. 2, emphasis added). In other words, students were only worthy/capable/trusted to undertake sustainability action in the future, presumably after their exit from the public education system. Further supporting this orientation was the policies’ use of

future tense verbs which signalled that sustainability action was a delayed action, rather than current classroom activity.

Sustainability action in the environmental education policy cluster. Despite conceptions of student as “future citizen,” the environmental education policy cluster stood out, paradoxically, for its inclusion of students as key sustainability stakeholders. Policies described intended student participation in formalized sustainability governance through mechanisms such as environmental education committees, student council, and overall increased student leadership. As rationale for student involvement, one policy stated that “climate change is a long-term problem that will be solved over multiple generations, so it is key to involve youth in the solutions” (Government of British Columbia, n.d., p. 1). This apparent contradiction between encouraging student involvement yet delaying civic action highlights a tension with many entanglements, including: the role politics in schooling, teachers as objective/subjective leaders, perspectives on student competence, and perceptions of risk. In practice, such contradictions may lead to tokenistic student involvement, where students are present during the decision-making process, but excluded from meaningful participation.

Indigenous education policy cluster. The Indigenous education policy cluster was represented by one text from each of Nunavut and the Northwest Territories. The word cloud depicted in Figure 3.5 provides a sense of the relative emphases of different components within this policy cluster, including a focus on land-based practices and specific animal species.

Orientations to sustainability within the Indigenous education policy cluster. ESE in the northern territories of Nunavut and Northwest Territories is framed entirely in terms of Indigenous knowledges, specifically *Inuit Qaujimagatuqanigit*. In fact, the word “sustainability” does not appear at all within the policies. The preface to Nunavut’s policy notes that its purpose is “1) to outline the philosophy of Inuit beliefs upon which to build the Nunavut education system. 2) to apply those beliefs to the elements of teaching and learning and curricular foundations for instruction in Nunavut schools” (Nunavut Department of Education, 2007, p. 15).

(Nuliayuk, Sedna). She is the one that is the giver of sea animals. If you anger her, she has the power to take animals away” (NWT Department of Education, Culture & Employment, 1996, p. 97). This group of policies endorsed worldviews of other living things as possessing both “spirit” and decision-making capabilities. Alongside extensive incorporation of **land-based knowledge**, these policies also articulated a need to adapt to changing world conditions: Inuit Qaujimajatuqanigit, a knowledge system defined in the below quote is presented as key to the continued thriving of northern communities:

Elders are articulating how and why Inuit Qaujimajatuqanigit –beliefs, laws, principles, values, skills, knowledge and attitudes – are so well suited to Inuit today. In doing so, the Elders are not advocating a return to the past, but a grounding of education in the strengths of the Inuit so that their children will survive and successfully negotiate the world in which they find themselves today (Nunavut Department of Education, 2007, p. 22)

Unlike the other policy clusters, these policy documents omitted internationally current definitions of sustainability as well as references to international commitments. These policies were instead grounded in an uncompromising understanding of the interdependency of humans and the natural environment, as described in the curriculum policy from Nunavut:

Elders describe maligait (natural laws) as the most fundamental laws entrenched in Inuit society that respect one’s place in the universe, the environment, and in society. These laws speak to interconnectedness in the world and the spiritual supports available to aid in survival. The natural laws are best described as the core laws of relationship that govern how one connects to other people and how one connects to the environment (Nunavut Department of Education, 2007, p. 28).

The orientation to sustainability, though not using this term, was based in Inuit laws and their inherent focus on relationality and respect, versus in more global aims and mandates of ESE, such as ESD or environmental education.

Teaching and learning in the Indigenous education cluster. Indigenous education policies also departed significantly from SD and environmental education policy clusters with respect to indicated pedagogical approaches. As discussed in previous paragraphs, these policies emphasized **interdependence and survival**, not simply as framing statements meant as policy justification, but rather as objects of pedagogical concern. In other words, these policies did not simply state that we need to educate for continued survival of humans and other species, they also

indicated *how* such education should be undertaken, including the development of appropriate knowledge, skills, and attitudes. For example, expected outcomes of students in relation to weather-based learning included: “develop a respect for unpredictable weather; ...understand why elders may harshly question them about their knowledge of the weather...develop the habit of examining the weather first thing in the morning” (Northwest Territories Ministry of Education, 1996, p. 98). All sections on teaching and learning included general principles and values, followed by specific examples of knowledge and practice.

Sustainability action in the Indigenous education policy cluster. The Indigenous education policy cluster did not include explicit engagement with sustainability action per se; rather, we interpreted “action” within this policy cluster as including community engagement processes. The Indigenous education policies reflected a **relational approach** to education policy development and practice. The policy documents themselves included not only textual commitments to community-based collaboration but were also prefaced by significant acknowledgement sections evidencing extensive community input in their development. In contrast with policies in other provinces, the Indigenous education policies each listed over one hundred contributors, including elders, educators, and ministry and regional staff members.

Given the immediacy of climate change impacts in Arctic, and the decades-long work of Inuit climate educators and activists (e.g., S. Watt-Cloutier, 2015; R. Kuptana, former President of the Inuit Circumpolar Conference), it was surprising to us that the curriculum policies from the two northern territories did not include any references to climate change. We recognize that such work might instead be carried out by other organizations, including the Department of the Environment, which hosts environmental education activities such as land-based camps, and the Nunavut Climate Change Centre. Despite its apparent absence, climate change is entangled with these texts: any reading or discussion of weather patterns, sea ice, land excursions, and animal behavior must necessarily reflect changes caused by global warming in the north¹⁶.

The Indigenous education policies described learning processes that assembled local land-based features and organisms as educational actors: land, ocean, ice, birds, whales, and others. Where other policy clusters tended to describe a generalized “environment” needing protection, the Indigenous policies depicted specific, northern land and animals/ plants/others with which

¹⁶ There is an extensive body of literature, films, websites, radio interviews, podcasts, etc. that document Inuit concerns about climate change (see Kunuk & Mauro, 2010; Watt-Cloutier, 2015; the Inuit Circumpolar Council).

humans are already always in relation. Community elders were an important component of this policy cluster, participating in development and enactment (through intended classroom-community-land visits). International sustainability mandates, such as those that influenced both SD and environmental education policies, were ostensibly absent.

Discussion: Implicated Policy Mobilities

Returning to international policy mobility, an increasingly dense web of global organizations has assembled, with mandates for ESE, climate change education, and more recently, global citizenship education. For example, in its 2018 assessment, PISA focused on global competence, which included assessment of competencies for “collective wellbeing and sustainable development” in explicit support of the UN Sustainable Development Goals (PISA, 2018). Provincial ministries of education included in this analysis demonstrated different forms of engagement with international mandates, from enthusiastic uptake of ESD, to absence in favor of local Indigenous frameworks.

Reviewing the findings across all three ESE policy clusters, policies within the SD policy cluster, particularly those from the province of Manitoba, evidence numerous alignments with international ESD mandates. This included definitions of sustainability from the Brundtland declaration (1987); a consistent “sustainable development pillars” framing of environment, society, and economy; and, lastly, a focus on whole system sustainability. In contrast, policies within the Indigenous education cluster presented as entirely localized documents, developed through extensive local consultation and drawing on Inuit knowledge systems and educational practices. Rather than a case of failed policy mobility, the Indigenous education policies represent instances of alternative and localized policy development (McKenzie & Aikens, forthcoming).

The policies within the environmental education cluster, however, evidence a more complicated relationship to international ESE mandates. The policy texts themselves indicate that different processes of policy recontextualization took place in each province, resulting in varying arrangements with respect to a global ESD assemblage. In the province of BC, mandates associated with a global ESD assemblage, such as the Decade of Education for Sustainable Development, were absorbed into a suite of already existing policy initiatives that addressed environmental education (Courteney-Hall & Lott, 1999), climate change (Government of British Columbia, n.d.), and sustainability (Fallon, VanWynsberghe, & Robertson, 2017).

In the province of Ontario, ESD was adapted to fit with environmental education priorities, despite mandates for ESE flowing directly from the decade of Education for

Sustainable Development in Ontario (Working Group on Environmental Education, 2007). We describe this adaptation a case of **recoding**, in which the Decade of ESD prompted action, but the terminology was not adopted and instead the pre-existing terminology of environmental education was maintained. By translating new ESD momentum to something locally suitable, local environmental education advocates would see themselves reflected in new policy. Ministerial policy actors would then be able to gain local purchase, while using processes of back-translation to respond to global ESD mandates.

Gaps and silences across the analysis: Some implications. In this section, we take a reflexive position with respect to this analysis in order to articulate challenges related to the *overall socio-political systems* within which ESE policies in Canada are developed, and the absences produced by such systems. We first discuss the overall deprioritization of ESE and climate change education evidenced by this analysis, then examine the failure of both sustainable development and environmental education policies to address root causes of the current sustainability crisis. We finish the discussion section by considering the relationship between ESE policy and Indigenous education in Canada.

Of a possible 13 provinces and territories, only 6 were included in this analysis as having addressed ESE through ministry of education policies. This signals an overall de-prioritization of ESE in the majority of educational jurisdictions in Canada¹⁷. Furthermore, climate change education was not a substantial component of any policy we analyzed¹⁸. Though the province of BC had developed policy focused on reducing emissions in school division operations, there were no pedagogical components attached to this policy. With significant climate impacts anticipated in the near future (Steffen et al., 2015), as well as an increased focus on education through international climate agreements (UN Paris Agreement, 2015), we anticipate that climate change education will become a more compelling issue of public concern in Canada.

Returning to the policies we identified as either sustainable development or environmental education policy clusters, we find it useful to ask the question: just how different are these policies? In terms of overall orientation to sustainability, policies in both clusters were

¹⁷ The most populous provinces (Ontario, Québec, and BC), comprising nearly three quarters of the total Canadian population (2016 Canadian census), all had developed ESE policy.

¹⁸The ministry of education in Manitoba has since released climate change education resources, in response to requests from teachers who indicated a lack of appropriate resource material.

largely aligned with the Brundtland “future generations” concept, as well as continued economic growth paradigms. Winter (2007) notes that the Brundtland report identifies two problems upon which sustainable development solutions are predicated: (1) a failure of economic processes, resulting in widespread hunger, lack of housing, and rising inequality; (2) a failure of environmental management, resulting in degradation of the natural environment. The problem of unsustainability is therefore one of unsound management: fix the management issues and the current paradigm of economic growth can continue unchallenged. Indeed, initial UNESCO documents outlining the scope of the decade of ESD defined sustainable development’s mission as “improving *everyone*’s quality of life, including that of future generations, by *reconciling economic growth*, social development and environmental protection (UNESCO, 2005, p. 3, emphasis added).

Though subsequent UN documents were more hedging in their treatment of unfettered economic growth, this failure to challenge dominant economic paradigms also presented in provincial policy documents. When these policies did acknowledge the limits of planetary resources, the threat was identified not as overconsumption or unequal consumption, but of world-wide population increase. This effectively located the problem of unsustainability not within a capitalist economic system predicated on unlimited expansion but within particular national contexts experiencing continued population growth.

Through an increased focus on the economic component of sustainability, the SD policies might offer opportunities to educate for more equitable and less destructive economic systems. For example, one curriculum policy within the SD cluster included the proposal that the solution to population growth was a parallel process of “dedevelopment” for developed nations and “development of a different type” for underdeveloped nations. The concept of dedevelopment, and what that might imply for education, including a pedagogy of dedevelopment is not explored further within the policy. Nevertheless, it does open up interesting possibilities for educators.

It is also worth discussing the meaning of these ESE policies within the larger education systems in which they are embedded. Policies intended to guide all of teaching and learning within public schools, the core competency and graduand attribute documents, emphasize the importance of sustainability (amongst other high-level skill and knowledge development, such as critical thinking and empathy) (Beveridge et al., in press). However, other analyses of ministry-level strategic plans demonstrate priorities of academic achievement and workforce participation (SEPN, unpublished data). Increasingly, performance on standardized tests such as the

Programme for International Student Assessment (PISA) are considered measures of a successful education system (Engel & Frizzell, 2015). While some have advocated for ESE on the grounds that its inclusion may improve individual academic achievement (Bartosh, Tudor, Ferguson, & Taylor, 2007; Ghent, Trauth-Nare, Dell, & Haines, 2014), education systems within Canada remain aligned with economic growth paradigms.

In contrast with the above, the Indigenous education policies in this analysis provided very different views of the purpose of education, emphasizing connections to human and non-human kin and development of deep land-based knowledge. Such policies depict an alternate paradigm for ESE, one rooted deeply in local conditions and practices. This is not a replicable model but rather an adaptable one, which must be shaped by local relationships to land and place. It is critical to note here that there are numerous incommensurabilities between Indigenous and Euro-centric knowledge systems (Todd, 2014; Tuck, McKenzie, & McCoy, 2014; Watts, 2013). Superficial work to integrate the multiple perspectives often results in neglect of differing cosmologies/ontologies animating each system and preserves colonial hierarchies (Donald, 2012; Nakata, 2002; Shava, 2013).

We would emphasize here that inclusion of Indigenous knowledge and practices into all Canadian curricula is crucial, in terms of both learning for sustainability, and Canada's stated commitment to reconciliation between Indigenous nations and non-Indigenous Canadians. We would add, however, that without curricula and pedagogy that explicitly work towards land reparations and Indigenous sovereignty, such measures remain inadequate (Tuck & Yang, 2012).

Conclusions

This paper examined ESE policy across six provincial and territorial ministries of education in Canada, in relation to a global ESD assemblage that mobilized mainly via UN mandates, such as the Decade of Education for Sustainable Development. While the four provinces included in this analysis all evidenced some amount of policy activity in relation to these international ESD mandates, the two northern territories presented localized, Indigenous approaches to sustainability education. Based on this analysis, we recommend that provincial and territorial governments invest resources in supporting self-determined Indigenous education policy and programme development related to Indigenous forms of ESE.

This analysis indicates that while there are multiple windows of opportunity within existing ESE policy frameworks, current paradigms of sustainable development and environmental education failed to address critical sustainability issues in Canada, namely

resource-intensive economic systems, and Indigenous sovereignty/Canadian colonialism. Engaging such issues places ministries in a difficult position with respect to educational politics, and an untenable position with respect to extraction and colonialism. In other words, there exists a fundamental tension between current Canadian political and economic systems and land reparations for Indigenous nations. Even if these issues are not adequately addressed within policy and curriculum, we suspect that there exist more subversive and radical undertakings within classrooms. Alongside analysis of new ESE policies as they are produced, we advocate for research that explores how practitioners (teachers, administrators, others) and students might be using the openings offered by ESE policy to create more radically sustainable educational practices.

Transition

Chapter 3 examined ESE policy mobility across six provincial and territorial ministries of education within Canada. While this analysis was limited to ESE governance and curriculum documents, it is still striking that fewer than half of the provincial ministries of education have invested resources in the creation of such policies. This is one demonstration of the overall lack of prioritization of ESE within Canadian K-12 public education.

We identified three distinct ESE policy clusters with differing relationships to a global ESD assemblage: sustainable development; environmental education; and Indigenous education. The sustainable development and environmental education policies demonstrated varying interactions with international sustainability mandates, while Indigenous education policies attended to local priorities without engaging international mandates.

Amongst these six provinces and territories, the province of Manitoba stood apart for the extent of its policy work in ESD. Manitoba is the only province to develop policy explicitly in accordance with whole school sustainability, and, as such, has invested in policy development across all whole-school domains, from governance to facilities to community outreach. The final data chapter, Chapter 4, examines the enactment of this ESD policy across four Manitoba schools. It examines how actors and material infrastructure come together to produce school-specific enactments and focuses on the relationships implicated in the ESD program successes in two of these schools. It also highlights the need for more research on the small-scale, everyday practices of school-based ESE leadership involved in policy enactment.

CHAPTER 4: A comparative case study analysis of ESD policy enactment in the Canadian province of Manitoba

Introduction

In 2005, the International Implementation Scheme for the Decade of Education for Sustainable Development (ESD) declared the need to “re-orient” public education toward sustainable development. Although ESD was heralded as a novel approach to environmental and sustainability education (ESE), similar statements on the urgency of reorientation date back decades (e.g., Tbilisi declaration, UNESCO-UNEP, 1978.) Nevertheless, the decade of ESD has had tangible impacts on national and subnational education policy and practice (Buckler & Creech, 2014; Wals, 2012). In the Canadian context, the decade spurred policy development across a number of provincial jurisdictions (Chapter 3; Nazir et al., 2009). What this means in terms of “on the ground” practice in K-12 schools is less clear: the processes and relationships involved in the school-level enactment of ESD policy are not well understood (Aikens, McKenzie, & Vaughter, 2016; Mogren & Gerike, 2017; Nazir et al., 2009; 2011). For example, Nazir and colleagues (2009) were critical about the state of research with respect to ESD policy and practice in Canada:

There is a paucity of research on how ESD, CCE or EE policy is being implemented, and its impact on schools and classrooms. Reports that do exist come from government bodies and other organizations active in the area. These self reports tend to be uncritical catalogues that focus on successes and are silent about problems and failures. This research gap may reflect a deeper systemic weakness, that is, the lack of emphasis on research in influencing policy and practice (p. 27)

These statements are also reflected in a more recent analysis of policy research across international, national, and subnational contexts (Aikens, McKenzie, & Vaughter, 2016).

The purpose of this paper is to examine *ESD policy enactment* within the Canadian province of Manitoba, through comparative case study analysis of four schools, and in relation to school division, ministry, and international ESE policy. This research takes a “relational” approach to analysis, focusing on how practices within schools, together with material contexts such as classrooms and other school facilities, work together to produce particular enactments of ESD policy.

Background

This paper is situated in relation to recent literature on policy enactment, as well as prior ESE research. The following sections highlight these literature contexts of the research, prior to a discussion of the methods and study results.

Policy enactment. The term “enactment” draws attention to the complexity of policy work in schools. This conceptualization of the policy-practice relationship is an intended contrast with the term “policy implementation,” which tends to focus on fidelity of practice with respect to policy. Instead, policy enactment is used to indicate an iterative process with a fuzzier demarcation between policy and implementation. Policies are complexly encoded texts, often constructed by multiple authors representing diverse and sometimes conflicting values and interests (Codd, 1988; Ball, 1994; Simons, Olssen, & Peters, 2009). Policy enactment examines how these complex texts are “interpreted and translated and reconstructed and remade in different but similar settings, where local resources, material and human, and diffuse sets of discourses and values are deployed in a hybrid process of enactment” (Ball, Braun, Maguire, & Hoskins, 2012, p. 6).

Different kinds of policies produce different policy subjects. Ball and colleagues (2011) distinguish between “imperative” policies which produce a “passive policy subject ... whose practice is heavily determined by the requirements of performance and delivery” (p. 612) and “exhortative” policies which permit greater interpretation on the part of policy subjects. Exhortative policies require active policy subjects, who “bring judgement, originality and ‘passion’ ... to bear upon the policy process, although this is tempered by the nature of the whole school response” (p. 615). Such policies can also be co-opted, or re-appropriated, though they also face easier rejection or dismissal. Exhortative policies provide greater opportunities for creative practices with respect to policy enactment. Though not an absolute division, imperative and exhortative policies often sort into respective categories of material and symbolic policies, with the latter usually lacking dedicated resources (Rizvi & Lingard, 2010). This has significant implications for material resourcing of exhortative policies.

This paper argues that, within the contexts of formal schooling in general as well as the specific provincial context under investigation here, ESE policies are exhortative and symbolic policy formations. Overall, ESE policy and curriculum tend to be perceived as optional components of formal schooling (Aikens et al., 2016), requiring emotional buy-in from individual school actors (Evans, Whitehouse & Gooch, 2012; Jucker, 2011; McNaughton, 2007;

Swayze & Creech, 2009). There are both affordances and pitfalls involved in enacting such policies, including opportunities for creative and entrepreneurial leadership practices. Previous research focusing on ESE leadership in schools suggests that school administrators play critical roles in building school vision; accessing resources for their school and staff, including professional development; and permitting creativity and risk-tasking to take place in their schools (Kadji-Beltran, Zachariou, & Stevenson, 2013; Mogren & Gericke, 2017).

Leader-centric analyses have dominated the literature of educational administration and leadership (Eacott, 2013; Evers & Lakomski, 2013) and are reflected in the above examples of ESE leadership research. Alternate paradigm proposals, which recognize the emergent and co-constructed nature of successful leadership within schools, include distributed leadership (Spillane, 2005) and relational organizational theory approaches (Eacott, 2018; Riveros, 2016). Relational approaches have attempted to overcome ontological divisions between structuralist and individualist views of school-based leadership, emphasizing instead the situated (or contextual) co-construction of organizational practices (e.g. Eacott 2018; Newton & Riveros, 2015; Riveros, Verret, & Wei, 2016). Conceptualising leadership as a relational phenomenon directs attention to the relationships among policy actors, as well as their shared (school) contexts.

Defining “context” with respect to the practices implicated in policy enactment remains a tricky undertaking; in a sense, any implicated component could be considered contextual: school buildings, general school “cultures,” broader community, available resources, student demographics, etc. Thrupp and Lupton (2006) drew attention to the complexity of context, demonstrating that even superficially similar school contexts produced drastically different results in student achievement.

Braun and colleagues (Braun et al., 2011; see also Ball et al., 2012) outline four inter-related contexts of policy enactment: situated contexts, professional contexts, material contexts, and external contexts. These respectively address school setting and intake; professional cultures and values; school buildings and resources; and broader policy pressures and authorities. Singh and colleagues note that this approach uses “context as a heuristic device to consider the circumstances of, and especially the ‘materiality’ aspect of these circumstances in ‘real’ schools” (Singh et al., 2014, p. 827). This paper focuses on material contexts such as classrooms and school facilities, and in particular the infrastructure-related affordances and limitations that are implicated in the school-level enactment of ESD policy.

Historical contexts of environmental education and ESD. This paper considers ESD to be one of many, non-mutually exclusive approaches within ESE. ESD was relatively recently formalized as a program of education, growing from the 1987 report of World Commission on Environment and Development, and the 1992 Earth Summit (U.N. Conference on Environment and Development). It was heralded by some as a new, more humanistic paradigm than its (apparent) predecessor, environmental education (Tilbury, 1995). While environmental education has sometimes been taken up as a broad educational concern, dealing with issues of poverty, justice, and livelihood, it has also rightfully received criticism for narrow, conservationist practices (Smyth, 1995; Tilbury, 1995). Meanwhile, ESD critics have identified concerns with the ambiguity, instrumentalism, and greenwashing potential of ESD (Jickling, 1992; McKenzie, 2012; Sauv , 1996). Currently, ESD and environmental education remain intertwined in both practice and policy, particularly in countries with historical investment in environmental education, such as Canada, the United States, and South Africa (Wals & Kieft, 2010). This analysis focuses on ESD because it is the policy term currently in use within the Manitoba Department of Education and Training.

Like its broader umbrella of ESE, ESD brings together multiple contested policy terrains within education. Through its focus on educating for a sustainable future, it claims to provide guidance as to the development of ethical, engaged citizens (Buckler & Creech, 2014; UNESCO, 2005). While preparing educated citizens is a widely-accepted central aim of public education, this is often depicted as a neutral rather than political process, in both practice and policy (Giroux & McLaren, 1986; Youdell, 2010). In practice, ESD is viewed by some educational stakeholders as inherently more political, in part because the development of sustainable systems involves challenging and dismantling the status quo (Nazir et al., 2011). ESD is intended to be action-oriented and problem-solving, yet the forms of student or teacher action may be relatively constrained with respect to environmental and sustainability concerns. In a Canadian context, issues of climate change emissions, habitat loss, and human wellbeing, are connected to resource-based economies. This complicates the introduction of sustainability issues into classroom teaching, particularly as the benefits and ills accruing from extractive industries are unevenly distributed (Agyeman, Cole, Haluza-Delay, & O'Riley, 2010; Dei, Hall, & Rosenberg, 2000).

Despite the urgency expressed through international declarations, ESD and other forms of ESE are often considered optional in K-12 education, enacted primarily by those passionate about environmental causes (Evans, Whitehouse & Gooch, 2012; Jucker, 2011; McNaughton, 2007;

Swayze & Creech, 2009). ESD and ESE practice in schools has largely relied on the labor of individual “green” teacher champions and/or been relegated to one-off events such as “Envirothons” or Earth Day celebrations (Evans et al., 2012; Henderson & Tilbury, 2004; Kennelly, Taylor, & Serrow, 2011). The history of ESE in schools, and its status with respect to “core” subjects (Gayford & Dillin, 1995; Puk & Behm, 2003), indicates the challenge of achieving the ambitious reorientation advanced by the UNESCO Decade of ESD.

More recently, ESD has been proposed as a whole-school endeavour, intended to transform not only teaching and learning processes, but also school governance, facilities, and community relations (Tilbury & Henderson, 2004; Wals, 2012). Whole school policy for ESD is therefore explicitly material in its orientation, directly implicating school buildings and surrounding communities. In practice, these material contexts interact with cultural conditions, such as local attitudes towards sustainability and professional cultures within schools, in order to produce temporally and locally specific enactments of ESD policy.

Contexts of ESD policy development in Manitoba. The province of Manitoba is unique within Canada for its efforts to fully integrate ESD into education policy and practice (Beveridge et al., in press; Buckler & McDiarmid, 2013). This commitment to ESD dates back nearly two decades and is supported by multiple policy mechanisms. The provincial education mission reads as follows (*italics added*):

To ensure that all Manitoba’s children and youth have access to an array of educational opportunities such that every learner experiences success through relevant, engaging and high quality education that prepares them for lifelong learning and *citizenship in a democratic, socially just and sustainable society* (Manitoba Department of Education and Training, n.d.-a)

ESD is also listed as one of five priority educational areas for the Manitoba Department of Education and Training, given equal rank with literacy and numeracy, and annual educational reports provide consistent evaluation of ESD efforts (2015, 2016). Whole school sustainability is promoted across all recent policies, with an emphasis on both systemic embedding of ESD into ministerial priorities, and incorporation of sustainability into curriculum, operations, community engagement, and governance (International Institute for Sustainable Development & Manitoba Department of Education and Training, 2016; Manitoba Department of Education & Training, n.d.-b).

The ministry encourages school-level ESD policy enactment, through a number of mechanisms, including accessible ministerial staff, training opportunities for administrators and tailored resources for incorporating ESD into school planning (Manitoba Department of Education and Training, n.d.-b). Furthermore, the ministry has committed to the goal of ESD integration into the annual school plan of each public and independent school within the province, with staff resources dedicated toward this priority (Manitoba Department of Education and Training, n.d.-b).

School-level ESD achievements are recognized through a provincially-administered eco-certification program, the Manitoba Eco Globe Schools program. Eco-certified school programs are internationally widespread and well-established (Boeve-de Pauw & Van Petegem, 2018; Eames, Cowie, & Bolsted, 2008; Posch, 1999); in Canada, there are multiple eco-certification programs operating at either the provincial or interprovincial level (Strobbe, Young, McKenzie, & Beveridge, 2014). Eco-certification recognizes success toward whole-school sustainability; it intends to move schools “from temporary individual initiatives to ecologically sustainable structures and to a combination of pedagogical, social and technical/economic initiatives” (Posch, 1999, p. 343). The province of Manitoba administers its eco-certification program directly through the provincial Department of Education and Training, rather than through a third party¹⁹. Because of this, the Manitoba Eco Globe Schools program functions as a policy apparatus for ESD implementation, through an encouragement and rewards-based model (McKenzie, 2017), rather than a mandatory approach.

Rather than focusing on a single ESD policy, this analysis examines ESD policy enactment as an ensemble of policies and policy mechanisms. This includes the suite of ministry of education policies described above (e.g., broad commitments to whole-school ESD, curricular frameworks, operations-focused policies), and the Ministry-operated Eco Globe Schools certification program, as well as school division policy texts and mandates established by divisional leadership (e.g. official statements by the superintendent).

¹⁹ While various eco-certification programs exist across Canada, Manitoba is the only province to administer its program entirely within the ministry of education. In other provinces, these programs are supported by not-for-profit organizations (E.g., Ontario Eco Schools; Écoles Verts Brundtland in Québec; Green Schools in Nova Scotia) (See (Strobbe et al., 2014)

Methods

This research was completed as part of a larger, pan-Canadian project, including case studies of 20 schools across 6 provinces and territories, conducted by the Sustainability and Education Policy Network (SEPN). The analysis in this paper draws on a subset of data from the province of Manitoba, including policy documents, interviews, focus groups, photo documentation and other field observations, and participant ratings of whole school engagement with sustainability.

Data collection. A combined 214 participants from Manitoba took part in this research; this included representatives from the provincial Department of Education and Training and two local school divisions; school staff and administrators, students, and community members. In total, this included 27 in-depth interviews, 9 focus groups, and 74 sidewalk interviews (5-minute interviews, conducted with staff and students throughout a given school). Researcher observations complemented interactive forms of data collection; team members completed extensive field notes for each school, accompanied by photo documentation notes. Photo documentation focused on the material contexts of the school buildings and grounds, and included indoor and outdoor common spaces, green infrastructure, transportation infrastructure, food procurement and preparation, waste diversion, and evidence of sustainability achievements, including eco-certification.

Data collection, including all participant interviews and focus groups, took place between December 2015 and November 2016. Policy documents were collected throughout this period, from school division and ministry websites, as well as from key policy informants who participated in interviews (e.g. school and divisional administrators).

The project team used a semi-structured interview approach for full-length interviews, combined with a brief initial questionnaire that provided information about participants' understandings of sustainability. Participants also provided a numerical assessment (ratings of 1-10) according to how they perceived their school's response to

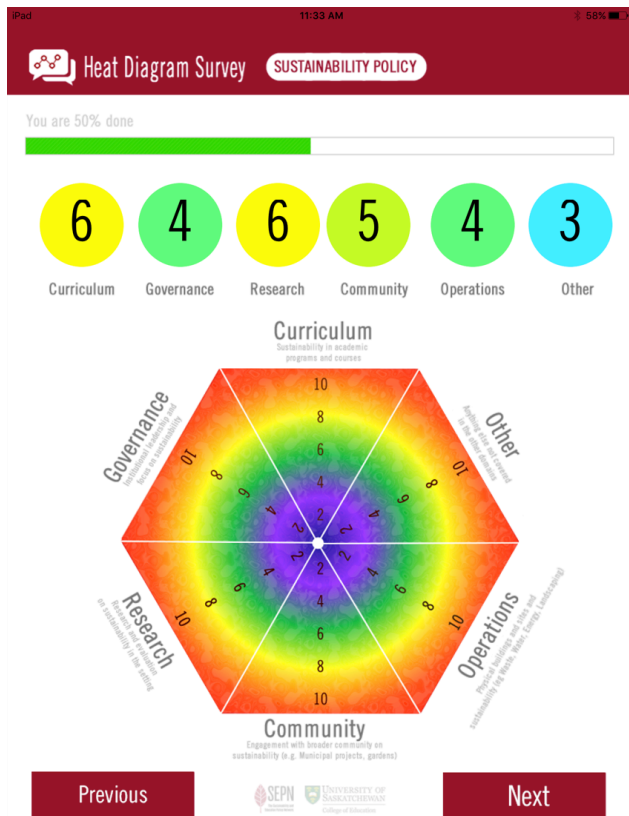


Figure 4.1 Heat diagram application with example participant ratings provided.

various domains of whole school sustainability. Instead of a traditional Likert Scale, we asked participants to evaluate their school’s performance with an innovative web-based application (“app”) we called a heat diagram (Figure 4.1) Participants were asked to assign a rating of 1-10, based on “how hot” their school was performing in each of five whole-institution domains: Governance/Leadership; Curriculum/Teaching; Operations/Facilities; Community Outreach; Research/Evaluation. An “other” category permitted inclusion of additional categories that individual participants felt were excluded from the five domains.

While the instrumental purpose of this app was the collection of comparative quantitative information, it also provided participants an opportunity to instantly visualize their own perceptions of sustainability within their school. Perceptions of areas of relative strength and weakness were immediately apparent, with the semi-structured interview providing space to discuss both high and low scoring domains of activity. Participants in interviews, sidewalk interviews, and focus groups all completed this heat diagram assessment of their school context.

Ministry and School Division participants also provided these assessments, based on their perceptions of sustainability uptake at the provincial and divisional levels, respectively.

Data analysis. All transcribed data were imported into NVivo11 and auto-coded by interview or focus group question. This enabled compilation of participant responses to specific interview questions and across particular thematic areas. As this study is part of a large-scale, comparative research project, the data analysis was conducted through two stages. The first stage was a foundational, collaborative system of thematic analysis intended to evaluate the pan-Canadian data. The second stage focused entirely on policy enactment within the province of Manitoba, building on findings from the first stage.

As part of the first stage of analysis, a team of researchers developed a process of analytic memo-writing, which provided a system of recording, cross-checking, and building-upon individual researcher analysis. Each interview question (e.g. “Policy outcomes: How would you describe the influence of this policy overall in your school?”) was auto-coded in NVivo and assigned to an individual researcher for thematic content analysis. The researcher reviewed all participant responses to the question and assigned inductive themes, then completed a standardized written memo. This written memo summarized thematic findings and provided key quotations and other notes required for interpretation. Each memo was, in turn, reviewed by the principal investigator and other team members.

The second stage of analysis was an iterative process of coding and secondary memo-writing that focused on actors, material contexts, and relationships. I used triangulation across all data types as a means of investigating agreements and tensions in the findings. Rather than ensuring representation of an absolute truth, triangulation served to “secure an in-depth understanding” of the theme or finding in question (Denzin & Lincoln, 2008 p. 7). Each significant finding was assessed across each data type, and frequency counts of coding in NVivo were compared with interview and transcript contents. For evaluation of whole school sustainability performance, I compared participant ratings across whole school domains directly with interview and focus group transcripts. I then examined researcher field notes and photo documentation for evidence supporting or contradicting observed patterns and illustrative stories.

Findings

In this findings section, I first discuss a focus in the data on school-level enactment of ESD policy based on alignment with the provincial eco-certification program. I present the enactment stories of two case study schools that had achieved significant success in ESD policy

enactment, according to participant perceptions and researcher observations. In each of these cases, I examine the relationships between school ESD leaders and school contexts in influencing ESD policy enactment. Following this, I discuss the challenges faced by the other two schools who struggled to maintain previous successes in implementing ESD policy, including barriers of school leadership.

School context. With respect to divisional ESD policy, the four case schools resided within two school divisions that had demonstrated significant ESD policy commitment. Schools 1 and 2 were located within a large, urban school division that had integrated ESD into divisional annual planning processes, provided a dedicated divisional ESD staff member, and developed specific divisional ESD mandates with respect to waste diversion and active transportation. Schools 3 and 4 were located within a small rural school division which had developed a large suite of policies addressing ESD priorities and created ESD-specific divisional governance procedures that engaged local school staff and students, such as an Education for Sustainability committee. Both school divisions offered ESD professional development opportunities and encouraged post-graduate training in ESD for administrators and teachers.

Each of the four schools included in this analysis had participated in the provincial eco-certification program, Manitoba Eco Globe Schools, with two schools awarded Awareness and Action levels, respectively, and two awarded Transformational level status. Awareness level schools must demonstrate widespread understanding of ESD principles and practices and have integrated ESD into school governance and classroom activities (Manitoba Department of Education and Training, n.d.-c). To move beyond Awareness to Action level certification, schools must demonstrate commitment to a variety of ESD action projects. Finally, Transformation level schools must provide evidence of “a school-wide culture transformed by an ongoing commitment to the principles and practices of ESD” (Manitoba Department of Education and Training, n.d.-c).

This section presents the enactment stories of two case schools who achieved significant success in enacting ministerial Eco-Globe certifications: School 1, which appeared to have quickly transitioned beyond its Awareness level designation; and School 4, which had managed to cultivate and sustain a pervasive cultural and material transformation towards sustainability (Figure 4.2). Figure 4.2 depicts perceived progress toward sustainability across all four case schools, as measured by staff (administrators,

Table 4.1 Mean staff ratings across each sustainability domain, for each of the four schools. Ratings are 1-10, with 1 indicating low sustainability activity and 10 indicating high sustainability activity. The “Other” category is not depicted here, as mean ratings for this domain are not appropriate, given that different areas identified by individual staff members were rated in each case.

	School 1 (5)	School 2 (2) ²⁰	School 3 (7)	School 4 (5)
Governance	7.4	5	7.0	9.0
Teaching	7.8	4.5	6.6	8.3
Operations	6.3	5.5	6.6	8.8
Community	5.8	5	7.0	7.8
Research/Evaluation	5.8	2.5	5.8	7.8

teachers, and other school staff)²¹ ratings (mean rating, scale of 1-10.) Ratings for the domains of Governance/Leadership), Teaching/Curriculum, and Operations/Facilities are presented here, while Table 4.1 includes mean ratings for all domains across all four schools. In contrast with Schools 1 and 4, staff at Schools 2 and 3 suggested that the schools were struggling to maintain their achieved eco-certification status.

²⁰ Only two staff members participated in formally rating their school at School 2. The heat diagram scores are not intended as quantitative data, but rather as a heuristic for depicting perceptions of ESD policy enactment. It is likely that if we had had access to other staff members, a more nuanced, less critical picture would emerge. Students at School 2 rated their school in more positive terms; however, there was wide variation in student ratings with a significant number indicating verbally or through writing that they were unsure of sustainability practices within the domain. Notably, students did perceive their school operations as more sustainable overall (mean rating of 7.3, range 5-10, n=21).

²¹ Staff includes teachers, administrators, and other employees. Student ratings are not given here, as they are not comparable across sites, due to varying ages and abilities to participate in a ratings process.

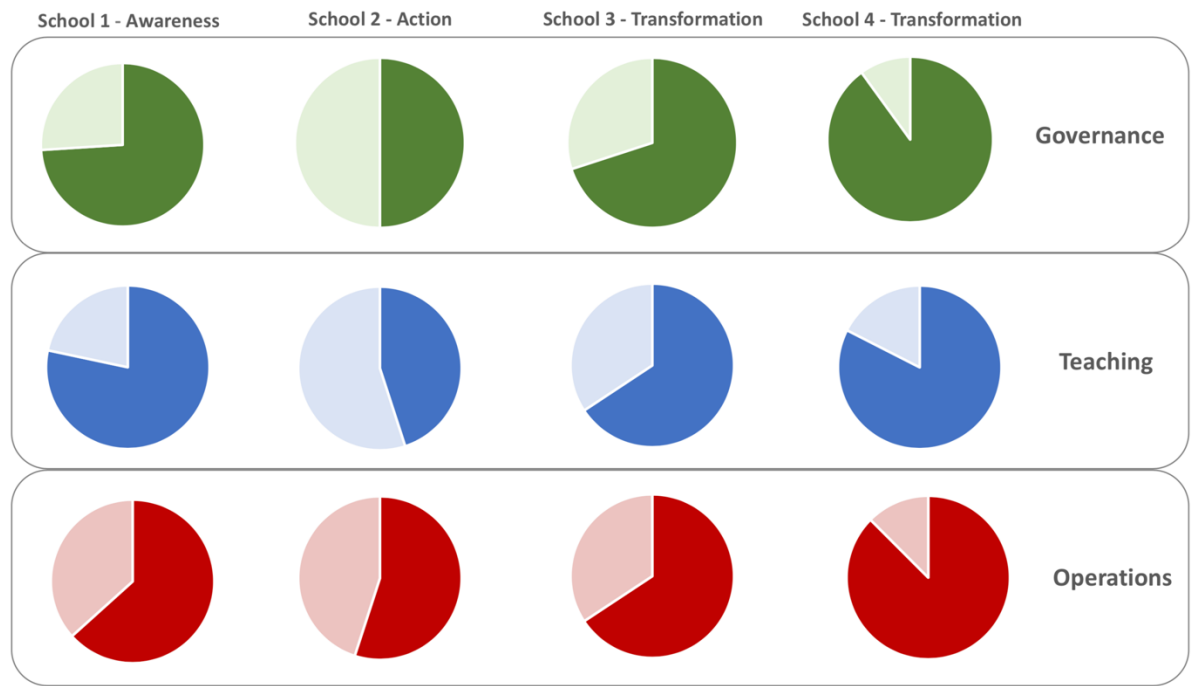


Figure 4.2. Progress toward creation of a sustainable school, as assessed by staff at each of four schools. The mean ratings for domains of governance, teaching, and operations are provided here.

School 1: Leapfrogging past awareness. Despite only recently achieving “Awareness” level eco-certification, School 1 was perceived by school staff members as demonstrating significant leadership in both ESD governance and teaching (Figure 4.2, Table 4.1). Researcher observations supported participant assertion: the school building and grounds, as well as interactions amongst teachers showed sustained growth in ESD initiatives. Teacher interviews suggested an expanding web of mutually-supporting colleagues, who helped one another through informal, skill-sharing partnerships. Furthermore, administrators and teachers perceived their school ESD program as directly supported by ministry ESD curricula, as well as divisional ESD policy and leadership: “Our superintendent, ... it’s very clear that sustainability is very important to him and our division and that’s coming from our leadership at the top” (Teacher, School 1). Analysis across data indicated two competing themes in the enactment of ESD policy at School 1; firstly, a sense of momentum in program achievement through a critical mass of dedicated staff; and, secondly, resource challenges related to space constraints and an aging building.

One of the more successful ESD programs within the school was an active transportation program which had ostensibly transformed the material contexts of the school building, as well as the relationships amongst staff and students. This school-wide program was intentionally aligned

with divisional active transportation commitments and included a campaign encouraging all students to walk or ride to school. There was evidence that the active transportation mandate was modifying the school building in subtle yet pervasive ways: student-made bicycling posters hung on the walls, and staff-made flyers advertised meetings of the bicycle club. In the classrooms of coordinating teachers, bicycle parts were overflowing from bins, and bikes were tucked into corners and hanging from stands. The most striking feature of the principal's office was the corner where multiple bikes and a child's scooter were housed. During one of our meetings, we were interrupted by students who poked their heads in the door of the office to ask Mr. H about retrieving their "wheels." After overhearing a few conversations, it was apparent that the principal often dedicated his after-school time to helping students repair their bicycles. Instead of an off-limits space reserved for student discipline, through the addition of the student bikes, the office became a space for principal-student collaboration.

The uptake of this active transportation program was mixed; on one hand, classrooms now housed spare bicycle parts, school walls displayed student-created signage, and an after-school bicycle club met regularly (Figure 4.3). On the other hand, staff described an uphill battle against local car culture and parental perceptions of risk related to active transportation, as described by the school principal:

...and this neighborhood was built on the idea that children would walk to school. There's all kinds of walkways and little paths... Yet every morning we have a giant clog up of people that don't even drop their kids- they pull around and they wait until they're right in front of the door, and they sit and wait until their kid goes into the school, and we've kind of lost the sense that these children are adolescents and they can walk and get here without being snatched away by scary strangers (School 1, Principal).

In this case, despite all the core ingredients for active transportation to school- alignment with divisional mandate; walk-able neighborhood; appropriately-aged students; supportive administration; dedicated school infrastructure- pervading perceptions of risk and convenience amongst parents tempered success and the uptake amongst students was not (yet) as extensive as hoped.



Figure 4.3 Evidence of the commitment to active transportation was visible throughout the school building and grounds.

When asked about the maintenance of ESD practices within the school, staff spoke about the introduction of a new school principal as a key inflection point in this particular school, with the principal serving as both a supporter of staff ideas, and an initiator of ESD programs aligned with school division mandates. The following quote from one of the science teachers describes the principal's supportive approach:

Right away when you mentioned leaders, I think of our own administrator, Jordan²². . . .

[H]e's been very encouraging for anything that - whether it be we want to do a mural in the back, for my class, we are looking at building gardens using reusable wooden pallets. So you know supporting that and talking to the staff, like, 'okay this [ESD] is important' (Science Teacher, School 1).

The new principal had also secured a stronger policy position for ESD within the school by deciding to incorporate ESD into the official school plan as one of five priority action areas. This school-level reorientation toward ESD followed provincial policy guidelines, as well as divisional mandates, and supported the uptake and expansion of various ESD programs within the school.

With respect to overall challenges of ESD policy enactment, administrators and teachers consistently cited lack of resources as a significant obstacle. The school building itself was perceived by staff as a persistent barrier; it was an aging building originally built for fewer students than were currently housed. Participants consistently linked descriptions of the school as

²² Pseudonym used here.

small and overcrowded with an overall divisional lack of resources. Staff described the school as a “have-not” relative to newer schools, particularly with respect to school facilities and green infrastructure.

This resourcing gap appeared to have contributed to a school culture of “guerilla sustainability” characterized by co-optation and re-appropriation of spaces and materials. While the active transportation program was understood as a specific policy mandate from the school division, it was not well-resourced with respect to school infrastructure. In many ways, the enactment of this ESD mandate was driven by the creativity of enthusiastic proponents, who willingly integrated program materials into their classrooms and the principal’s office (Figure 4.3). This form of guerilla sustainability meant that, despite pervasive material evidence of ESD programs, the program had no dedicated space within the school and was not functionally integrated into school operations.

Overall, despite resourcing gaps, School 1 managed several successful ESD programs, which school staff perceived as accomplishing divisional and provincial ESD mandates. These included a healthy, waste-free school lunch program, a school-wide composting initiative, and hands-on ESD learning in classrooms. Within a short time-span, this school had effectively “leap-frogged” past its sustainability Awareness certification.

In many ways, School 1 demonstrates the contingency and relationality of ESD policy enactment within schools, particularly how certain levels of sustainability enactment are achieved through the temporal assemblage of key actors. Prior to the introduction of the principal and several new teachers, school sustainability work was isolated to a few classrooms. The rapid expansion of sustainability infrastructure indicated a latent capacity for action within the school, enabled through the addition of new supporting actors. These new actors effectively drew links across fragmented people, programs, and material resources, resulting in a more tightly supportive sustainability “web” within the school. This sustainability web is critical in the successful enactment of exhortative policies (Ball et al., 2011) such as ESD, particularly when these policies are understood low priority in relation to “core” educational subjects.

The contingency of this sustainability web also demonstrates the vulnerability of such work: loss of one or more nodes within the web could result in the dismantling of programs and infrastructure. The continued enactment of ESD policy within the school was reliant on continued supply of sustainability champions, either through avoiding staff turnover or replacement with

other ESD enthusiasts. Interaction with material contexts is also key here; despite pervading evidence of sustainability programs throughout the school, the space constraints meant that this infrastructure was largely non-permanent and required the continued buy-in from classroom teachers in order to persist. This highlights the challenge of resourcing whole-school sustainability policies; financial resources adequate to the ESD infrastructure needs of School 1 would exceed the yearly grants offered by the school division and ministry by several orders of magnitude.

Sustaining transformation at School 4. The sustainability web at School 1 appears to have assembled mainly by happenstance, i.e., neither the supportive principal nor the enthusiastic new teachers were assigned to the school specifically for their ESD advocacy. In contrast, participants at School 4 narrated a story of sustainability “Transformation” that depicted deliberate curation of a school-wide network of sustainability champions. Key themes emerged through analysis across data types: diffuse participation in ESD practices, creative interaction with material contexts, and access to resources.

The principal had served as lead administrator for six years, and described collaborative decision-making processes in school structure, practices, and staffing that enabled sustained, tangible ESD practices and infrastructures. According to interviews with the principal and other staff members, these transformations resulted from widespread commitment to learning for sustainability, as well as alignment with divisional Education for Sustainability policy and priorities. Staff within the school uniformly described an atmosphere of encouragement and expressed feelings of mutual solidarity and support (Staff interviews, 1-6).

Critically, the principal had decided early on to diffuse ESD leadership beyond her own work, designating a lead sustainability teacher, and re-structuring the school time-table to include a dedicated daily sustainability timeslot:

I have a teacher at my school that came in to my classroom for many years, I guess 20 years. I saw this really strong skill-set in her and sustainability. When I became principal, I asked her to be a lead teacher in sustainability and I time tabled slots, a 30-minute slot [daily, for all students and staff] for her to *co-construct knowledge* at our school and *co-teach* and lead the way. It was kind of scary because she said well what do I do? We don't have curriculum document necessarily, it's embedded in our curriculum document (Principal, School 4, emphasis added).

In addition to regular practices of formal ESD leadership through the lead teacher and principal, classroom teachers as well as the specialized music and physical education teachers described how ESD had become embedded in their teaching practices. Notably, our school visit was not timed in order to showcase ESD work, yet all classrooms demonstrated active ESD projects. The physical education teacher described an affective and material transition in teaching approaches with respect to the outdoor material environment (i.e. “nature”):

You know at one time kids would bring in snow from outside and at one time it was, ‘snow stays at the door.’ But as we all kind of got using nature as our teacher, we said bring the snow in. You know, yeah, that is a cool looking piece of ice! And then we were watching it and observed it and looked at it much closer and writings came out of that and discussion and yeah it was gone by the end of the day, right? And whoa, maybe it left a sediment behind and why was that it- we didn’t see it before, and so a lot of this discussion (Physical Education Teacher and Sustainability Lead, School 4).

According to school staff, this transition was not led by one person, but rather emerged as interaction between students’ outdoor play, the material natural world, and an evolving staff commitment toward ESD and environment-as-third-teacher pedagogical approaches (including Reggio Emilia early learning approaches, e.g. Rinaldi, 2004.)

Commitment to enactment of whole school ESD policy required buy-in from all staff members. The school custodian was integrally involved in the school sustainability operations and, through the principal’s support, became an educator working with rotating groups of students through composting, recycling, and gardening:

So they [the students] saw potatoes grow, you got to dig them up. That was a learning curve for a few of them. They never really did it, so it’s nice for people that don’t see these type of things to do it hands-on. And work in the garden, they’re all keen on it (Custodian, School 4).

The school garden was a site of integrated, cross-curricular teaching that reinforced provincial curricula for whole-school sustainability through hands-on learning and development of affective ties amongst classes, and between staff and students. One teacher described the affective learning process through sharing her memories of the previous year’s wheat harvesting:

Well one [story] I love to recall is a grade four boy winnowing, seeing the wind take the chaff and the grain fall. And he’s collaborating with someone and he yelled out “This is

fantastic! I'll never be able to winnow again in my life." And we're like, this is a nine-year-old and he kind of had this concept that...this might be the last time he might be winnowing grain... he just felt elated. And you can't script it or buy it, it just happened (Teacher, School 4).

These affective relationships amongst staff, students, and garden plants were supported by a strong material infrastructure. In addition to extensive school gardens, there was a sizable outdoor greenhouse (Figure 4.4), purchased through fundraising by the school community (staff, students, parents, and community members), as well as grants provided through provincial ESD policy commitments.

The school principal and teachers articulated a strong commitment to inquiry-based learning, one that was deliberately cultivated through formal and informal professional development and outreach with parents and community. The principal acknowledged that this transition away from "traditional" learning felt risky, but in the



Figure 4.4. Outdoor greenhouse at School 4 with raised-bed garden boxes visible to the right.

end, had been widely embraced by the school and surrounding community. She attributed its success to a system of reinforcing links amongst school philosophy, provincial curriculum, and

divisional priorities:

I also fostered that culture through my vision and my mission, my message. I acted, I lived and breathe that message. So, I modelled what I wanted for our school. So, it kind of trickled down. It was an invitation to explore... but it was not mandated. But then combine that with the focus on education for sustainability, it all just sort of merged together. It fits with our curriculum. There wasn't problematic in that sense. It all was aligned with our division. That's what made it really easy. At Evergreen School Division mission statement and education plan, it fit beautifully with that. So, there was nothing that was out of step, didn't fit with them.

This quotation, combined with interview, observational, and document analysis, evidenced a sustained approach to whole-school ESD, embedded within and across professional learning communities in the school, the division, and the province. This approach required support from formal school leadership (the school principal), as well as informal leaders, such as the lead sustainability teacher and the school custodian, in forming a network of distributed leadership (Riggan & Supovitz, 2008; Spillane, 2005).

According to interviews and policy documents, School 4 experienced a critical synergy in its process of ESD policy enactment: the initiation of the school's ESD vision and practice took place concurrently with a renewed divisional commitment to ESD. This enabled significant support for the school, in terms of knowledge-sharing, professional development opportunities, financial support, and formal divisional recognition of the school's ESD achievements (Interview data: School 4 principal, School Division Director; Research field observations; School-based document collection). To date, there is little research investigating the role of local policymaking in supporting school-based ESD policy enactment (Aikens et al., 2016, but see Swayze & Creech, 2009²³); however, in this case, evidence points to a potential amplified effect when both divisional and school commitments align.

This alignment between divisional and school commitments included increased access to both material and affective forms of resources. The material resources included funds for infrastructure development within the schools, both small-scale changes modifying classrooms,

²³ Swayze and Creech published an extensive report on the relationships amongst provincial and divisional policy, and school-level sustainability action in Manitoba. At the time of their survey, they found that divisional policy had little effect on school projects; however, they concluded that strong divisional policy would be an important factor in creating systemic change.

as well as larger structures such as the school greenhouse. Affective forms of divisional resources included sustained recognition of the school's ESD achievements, appointment to sustainability leadership committees, and support for riskier and more novel approaches, such as the overall integrated, inquiry-based learning program at the school.

Struggling to sustain. While School 1 appeared to have leapfrogged its Awareness level eco-certification, and School 4 had maintained a challenging transformational level status, Schools 2 and 3 seemed to be struggling to preserve their designated sustainability achievements. Analysis of participant interviews, field notes, and student focus groups indicate a variety of factors contributing to the sense of struggle, including teacher perceptions of isolation with respect to ESD activities and organizational bottlenecks.

In both schools it was evident that participation in ESD activities was limited to a relatively small group of teachers and classrooms. Particularly in School 2, there was a sense of fragmentation and isolation amongst the teachers we spoke with. They described many competing interests and a greater number of barriers, including a perceived lack of administrative buy-in. Despite policy commitments to sustainable operational standards, and initial momentum toward achieving LEED (Leadership in Energy and Environmental Design) gold standard, eventual budgetary constraints meant that the school fell short of its sustainability certification.

Teachers within School 2 did not feel that ESD was a priority, either within their school or overall within the division, as suggested by this interview quotation: "I guess I'm more blunt and honest, I think it was a lot of more bluster and saying that we're doing it but it's not necessarily something that we're doing in practice [in the division]" (Teacher, School 2). This contrasted with perceptions of strong divisional leadership in ESD policy articulated by staff at School 1, which was located in the same school division.

Organizational bottlenecks also emerged as a factor limiting success of ESD policy implementation within both schools. At School 2, one teacher described delays in communication as a gatekeeping activity on the part of the school administration, which had curtailed his ability to undertake sustainability initiatives, including a school Eco Club: "Recently, a few kids have come to me with interest, which I'm very happy about, about doing an Eco Club... Unfortunately, though, I've talked to admin and it's been a month and they haven't even gotten back to me" (Teacher, School 2). The teacher expressed these delays as demotivating; although he had undertaken postgraduate training in sustainability education and had developed several

project ideas, none had come to fruition at the time of our interview. Therefore, despite an initial set of ESD policy activities undertaken by the teacher (the postgraduate program funding and promotion was directly linked to divisional ESD policy), further activity was curtailed by an apparent bottleneck in administrative support. In the context of a prior personal perception of administrative de-prioritization of ESD policy, the teacher interpreted this specific administrative communication delay as further evidence of apathy toward ESD policy enactment.

At School 3, the principal spoke directly about his understanding of administrative gatekeeping, through a lens of protecting teachers' time and prioritizing amongst competing needs:

There are lots of things going on simultaneously and it's easy to lose focus on what we say is most important. So on any given day, I'll receive half a dozen requests for things... But you can't do them all, because teachers are stretched pretty thin... we'll rationalize it as we really care about all these things so we need to do them all. But the truth of the matter is we do a lot of them not so well [laughs] because you can't. We don't actually have the capacity to do that. So that's a stressor within the system, I think all the way down from ministerial to being in a classroom of saying now they want this, now they want this, and they're all good things, but we know enough about change theory to know that only a couple things can be happening (Principal, School 3).

In this case, despite having received Transformational level sustainability certification and residing within a school division with significant ESD policy commitment, School 3 struggled to maintain momentum in implementing policy for whole school sustainability.

The two cases of "struggling" schools point to the limits of [some] eco-certification programs as policy instruments to support ESD enactment. Despite encouraging progressive achievement of higher certification levels, once a satisfactory level of Eco Globe certification is achieved, there is no external motivation to continue the ESD practices that led to the certification. In other words, the certification in-and-of itself is a temporally-fixed achievement; schools do not lose their certification and once achieved, can "choose" to enact other kinds of school practices.

Discussion: Refraction and the Role of Administrators

As Ball, Maguire, and Hoskins (2011) note, policy produces particular subjects. Even in contexts of high ESD policy commitment, ESD continues to be perceived as optional (Evans,

Whitehouse, & Gooch et al., 2012). This perception of ESD policy produces a fundamental division in policy actors, between those who opt in and those who do not. Rather than a form of resistance, opting out of ESD is positioned as more mainstream, as environmental and sustainability education is still widely perceived as political and adjectival (Evans et al., 2012; McNaughton, 2007; Stevenson, 2007; Whitehouse, 2001).

The Department of Education and Training in Manitoba is one of only two ministries of education in Canada to mandate ESD uptake at lower levels of administration²⁴. Rather than requiring divisional policy, the Manitoba department has committed to ensuring each school has integrated ESD into its school plan by 2019. At the time of research interviews (2015-16), 93% of public schools had achieved this goal (Department of Education and Training, key informant). This means that school principals are in the position of having to report on ESD activities and are expected to respond not only to teaching activities, but also operations, community engagement and other forms of whole school ESD policy enactment.

Evidence from all four schools indicates that school administrators play a critical role in mediating teacher perceptions of ESD policy commitment. This analysis suggests that school level administrators are “refractive actors”²⁵ with respect to division ESD policy; i.e., the existing policy mandates are refracted through administrator enactment of ESD commitment (or lack thereof). Teachers’ perceptions of divisional commitment are subsequently and iteratively amplified or diminished, according to their observations and interactions with administrators.

School administrators can also play mediating roles in the relationship between material contexts and whole school sustainability. Enactment of sustainable operations policies in particular requires transformation of the material conditions of school buildings and grounds. Examples of re-making of school grounds included: a large greenhouse on school property; a natural playground; school gardens; outdoor classrooms; active transportation infrastructure. Within school buildings, there were cafeteria renovations; aquaponic installations; indoor

²⁴ The province of Ontario has mandated adoption of an environmental education policy for each school division in the province. It has largely been successful, with 88% of school divisions producing a publicly available policy within five years (Beveridge, McKenzie, Aikens, & Strobbe, 2019).

²⁵ The term “refractive actor” draws on work by Supovitz (2008) and Taylor and Henry (1995). Supovitz conceptualized policy implementation as an iteratively refractive process “through which reforms are adjusted repeatedly as they are introduced into and work their way through school environments.” (2008, p.153).

greenhouses; and, finally, the re-making of every classroom in the school to better support hands-on ESD inquiry. These indoor and outdoor transformations often required not only administration permission to proceed, but also more active forms of support through navigating complex divisional bureaucracies and completing multiple detailed grant applications (Interview participants, Schools 1, 3, 4).

If project initiation is critical, so too is project maintenance. Administrators are able to foster continued care and use of such facilities, and, in cases of staff turn-over or burn-out, appoint new administrative responsibilities (or better yet, strengthen ESD practices through multiple point people, School 4). When administrator support is lacking, facilities can become vestigial components of school grounds, neglected and un-used. In this way, administrators play critical roles in both ESD program initiation and maintenance.

Implications and Conclusions

This analysis highlighted the role of leadership in school contexts, beyond the role of few charismatic visionaries, as is commonly depicted in ESE success stories. This analysis suggests that sustained enactment of ESD policy is linked to everyday school practices undertaken through webs or networks of school-based actors, in relation with their material contexts.

In the case of School 4, ESD was supported by a vision for sustainability that was co-created and widely endorsed by staff and students. In practice, leadership was diffused amongst team members, with apparent high trust and distributed recognition for achievements (Scott, 2013; Spillane, 2005). For example, the school custodian was integrated into the ESD educational team and had accepted awards on the school's behalf. The school itself had been transformed from classrooms to school grounds, with sustainability "locked in" to both the material infrastructure and daily practices of the school. Scott (2013) highlights the importance of securing sustainable operations in this manner, stating that

The "locked in" notion is particularly crucial as development will not take place in a progressive way unless there is firm ground upon which to build – ground that will not shift or be eroded with, for example, the arrival of a new school leader (p.189).

In the case of School 4, even if the charismatic principal left her post, there were several back-up mechanisms that could serve as protection against dismantling of the ESD programs within the school, including other school leaders, widespread integration of sustainability into teaching practices, redesigned school timetable, and extensive school facilities.

Beyond distributing sustainability leadership across the school, the principal at School 4

demonstrated strong qualities of a school-based “policy entrepreneur” (Ball et al., 2012). Policy entrepreneurs perform critical roles with respect to school-based policy enactment. According to Ball and colleagues (2012), policy entrepreneurs

seek to recruit others to their cause...to build a critical mass for change and to bring off policy enactments. They rework and recombine aspects of different policies, draw on disparate ideas, examples of “good practice” and other resources to produce something original, and crucially they are able to translate this into a set of positions and roles and organizational relationships which “enact” policy (p. 53).

The success in enacting ESD policy across all whole school domains, as evident at School 4, relied on the creative, entrepreneurial work of the principal. The implication here is that the initial stages of ESD policy enactment may require the deliberate placement of similar policy entrepreneurs in school leadership positions, in order to achieve transformation across whole school domains of school governance, operations, teaching, and community outreach.

It is important to highlight here that material contexts, including classrooms, school grounds, composting and greenhouse facilities, are critical in maintaining sustainability. They support the maintenance of everyday sustainable practices involved in school-based policy enactment. There is little research attending to the rhythms or everyday practices in schools that support ESD policy enactment (or, more broadly, ESE policy enactment). In order to better understand how those practices are initiated and maintained, in relation to material contexts, in-depth case studies of schools with high sustainability performance are needed. Conversely, similar studies of struggling schools could also shed light on sites of challenge or struggle with respect to ESD policy enactment.

CHAPTER 5: Assembling conclusions and contributions

Synopsis

This doctoral dissertation used critical comparative policy analysis to investigate ESE policy research and policy enactment across international, national, provincial and local contexts. The critical component of this research required attention to structures and relations of power, while the comparative component required investigating themes and relationships across units of analysis. Overall, this research aimed to examine ESE policy research internationally, and ESE policy in the Canadian education system.

Chapter 2 contributed to this objective by supplying a foundational analysis of the state of policy research within the (international) field of ESE. This work provided guidance for the following two chapters which were empirical analyses of the contexts of ESE policy and practice. Through analysis of ESE policy texts developed by provincial and territorial ministries of education, Chapter 3 provided insight into how ESE has been adapted in different provinces and territories in Canada and according to different paradigms, including sustainable development, environmental education, and Indigenous education. Finally, Chapter 4 examined how an ESD policy mandate was translated into practice in four Manitoba schools, and the central role of school-level leadership in ESD policy enactment. This final chapter provides a summary of each manuscript, outlines their contributions to the literature, and describes dissemination contributions to date. It also includes a discussion of challenges encountered during the research and limitations of the findings.

Chapter 2 reported on a systematic literature review of policy research in the area of ESE and was co-authored with SEPN principal investigator (McKenzie) and postdoctoral fellow (Vaughter). We analyzed 215 research articles, spanning four decades and representing 71 countries, and which engaged a range of methodologies. Our analysis of geographic distribution of research outputs indicated significant gaps in representation, likely attributable in part to the limits of English-language searches. The majority of studies reviewed (70%) were non-empirical discussion papers or reports; however, approaches to empirical policy work had diversified over the last several decades indicating development of a more robust field of policy research. We concluded our analysis by making several key recommendations for ESE policy research, advocating for greater investment in critical policy theory and methodology; intersectional policy

analysis which attends to issues of race, Indigeneity, and coloniality; and climate change education.

Chapter 3 examined the mobilization of international ESE policy across six provincial and territorial ministries of education in Canada. We identified three distinct ESE policy clusters with differing relationships to a global ESD assemblage: sustainable development, environmental education, and Indigenous education. The sustainable development and environmental education policies demonstrated varying interactions with international sustainability mandates, while Indigenous education policies attended to local priorities without engaging international mandates. This analysis focused on the heterogeneous components of policy texts within each cluster and documented variegated emphasis with respect to sustainability orientation, sustainability action, and teaching and learning approaches.

Chapter 4 used comparative case study analysis to examine the ESD policy enactment in four schools within the province of Manitoba. I focused on the relationship between actors and contexts, to explore how particular ESD policy enactments are produced in specific places (i.e. schools). This chapter examined policy enactment in relation to a provincial eco-certification program, which functioned as a policy apparatus through an encouragement and rewards model. Chapter 4 explored the successes and challenges in enacting ESD policy, first in two schools which had experienced sustained achievement in their ESD programs, then in two other schools who struggled to maintain their designated sustainability status through the eco-certification program. These analyses highlighted the role of “relational” leadership, which is distributed amongst different school-based actors and reliant on material infrastructures.

Research Dissemination and Impact

In the introductory chapter of this thesis, I outlined goals of contributing not only to scholarship but also to ESE policy and practice. In this section, I describe the various forms of research dissemination I have undertaken in order to contribute to both academic and policy-practice domains. As part of SEPNI, I recognize that my dissemination work has relied on many relationships cultivated by others; in a reciprocal spirit, I have endeavoured to strengthen network connections.

Chapter 2 was published prior to the submission of this thesis and was included in a virtual special issue on policy research in the journal *Environmental Education Research*. I presented this work at a roundtable at the annual meeting of the American Educational Research Association (AERA) in 2015. I also worked with Routledge’s social media team to produce a

brief video abstract for the paper. In the 2.5 years since its online publication, the paper has been cited nearly 30 times, which is a healthy citation rate for the field of educational research (Environmental Education Research, top quartile journal, 2017 citation rate of 2.595). My co-authors and I worked with SEPN staff, Christine Thompson and Nicola Chopin, to co-author a short, accessible research brief that summarized this research (Appendix K). This research brief has been shared at conferences and meetings from 2016 to present.

Chapters 3 and 4 will be submitted for publication in spring 2019. I have presented this research, along with findings from the broader SEPN project, at various conference venues, including the annual meetings of the AERA, the Environmental Studies Association of Canada (ESAC), and the Canadian Network for Environmental Education and Communication (EECOM). Reporting back to the participating school communities is both a personal and network priority. In the spring of 2019, I will be co-authoring individualized reports to the four schools who participated in my dissertation research, in addition to providing support for the reports to the additional 16 schools who took part in SEPN research.

Research Contributions and Recommendations for Future Research

This work was completed through SEPN, which was established with the goal of addressing the gap in coordinated, national-level analysis of ESE policy and practice in Canada. This dissertation contains three publication-length manuscripts that aim to strengthen the empirical base of critical policy research within the field of ESE. All contributions are in K-12 education, with a focus on international (manuscript 1), inter-provincial (manuscript 2), and intra-provincial (manuscript 3) policy contexts. To maximize utility of this research, I took a somewhat eclectic analytic approach, opting to follow those who advocate for a “toolbox” of theoretical and methodological approaches (Ball, 1994). I assert that this dissertation makes the following scholarly contributions:

- (1) It provides a systematic assessment of peer review articles focusing on policy research within the field of ESE. This contribution contributes not only a critical foundation for the following two manuscripts but also serves as a basis for other researchers to better understand how to contribute to the ESE policy literature, as well as how ESE policy research could better intersect with broader policy research trends and needs. This contribution represents the first such assessment of ESE policy research to date.
- (2) It uses comparative case study analysis to examine how international ESE mandates are taken up across a variety of provincial policy contexts. At the time of publication of

Chapter 2, there existed no examples of pan-Canadian (interprovincial) policy research focusing on ESE²⁶. Chapter 3 contributes one of the first comparative, cross-Canadian analysis of ESE education policy in Canadian ministries of education. Chapter 4 takes a more in-depth focus on a single provincial context, examining policy enactment in four Manitoba schools.

Chapter 2 assessed the status of policy research within ESE in K-12 contexts, according to peer-reviewed journal articles. This chapter outlined several methodological and geographic gaps within ESE policy research, including a relatively scant empirical focus, and an over-representation of particular national contexts (e.g., the United States, the United Kingdom, and Australia) in the literature. This indicates an impoverished evidence base for ESE policy; we simply do not have adequate data to understand and make recommendations toward policy enactment across different national and subnational contexts. Given the urgency of education for a sustainable future, ESE policy researchers have a dual role: to undertake more empirically-grounded policy research AND to work simultaneously towards ensuring the use of such research in policy development and practice. This requires sustained involvement of policy actors in research: both policymakers and practitioners²⁷ need to be involved in determining research goals, processes, and dissemination (Davies & Nutley, 2008; Edwards, Sebba, & Rickinson, 2007; Stevenson, 2013).

One surprising finding in Chapter 2 was the relative paucity of policy research in Climate Change Education (CCE). Prior to 2005, few articles mentioned climate change, and far fewer overall (1974-2013) included climate change as a substantial focus (for exceptions see Bangay & Blum, 2010; Feinstein et al., 2013). Since analysis for this article was completed, there has been a substantial increase in CCE-focused publications, including a recent meta-analysis of research (Monroe, Plate, Oxarart, Bowers, & Chaves, 2017) and a cross-national Canadian study (Bieler et al., 2018).

²⁶ Since then, SEPN members have published several peer-review publications and research briefs on ESE uptake across all K-12 Ministries and school divisions (Beveridge et al., in press), eco-certification programs (Strobbe et al., 2014), as well as climate change education commitments across four Canadian provinces (Bieler et al., 2018).

²⁷ In practice, categorizations of policymaker and practitioner are blurred rather than bounded. Actors may traverse different categories, for example, when teachers form part of local policy development teams. Even the act of translating policy in order to put it into practice “makes” policy.

Following on from the decade of ESD, the Global Action Programme has included an increased focus on CCE, including a UNESCO Associated Schools Programme “climate ready” initiative (Chopin, Hargis, & McKenzie, 2018; UNESCO, n.d.). There still exist chasms between aspirational international climate change declarations and national action on climate change. Recent analysis of national documents submitted to the United Nations Climate Change²⁸ organization as part of the Paris Agreement indicate that most nations are only beginning to integrate CCE into education curricula and policy (McKenzie, forthcoming). There is a clear need for networked programmes that effectively incorporate climate action into all domains of public education, across K-12, postsecondary, and community contexts. Researchers can provide connections to international organizations and resources, as well as coordinate effective evaluation schemes that identify good practices and their supporting conditions.

Chapter 3 provided one of the first comparative analyses of provincial ESE policy for Canada. Policy analysis to date had consisted of provincial-level studies of Ontario (Puk & Behm, 2003) and British Columbia (Courtenay-Hall & Lott, 1999). This paper complements recent work by Bieler and colleagues (2018) examining educational responses to climate change across four provincial contexts. The comparative assessment of provincial ESE policy presented in Chapter 3 provides a foundational analysis for researchers interested in both comparative and single case ESE policy enactment in Canada. Furthermore, as provincial policy priorities evolve in response internationally current conceptions of ESE and CCE (e.g. UNESCO, 2015; PISA, 2018), this assessment provides a starting point from which to evaluate adaptations and new approaches.

To my knowledge, this paper is also one of the first within the field of ESE to report on Indigenous ESE K-12 policy in Canada (see also, Bentham, Wilson, McKenzie, & Bradford, in press; Vizina, 2018, which focuses on Indigenous ESE policy in postsecondary education in Canada.) Inclusion of Indigenous ESE policy within this analysis helps make visible other policy worldviews and approaches. While I recognize that development and use of this policy was/is not an idealized process,²⁹ it nevertheless offers an alternate paradigm within sustainability

²⁸ Formerly the UNFCCC, United Nations Framework Convention on Climate Change.

²⁹ The IQ framework is not universally applauded within Nunavut; some Inuit educators appreciate it while others prefer to use other philosophies of teaching and learning (SEPN, unpublished data.)

education. It my cautious recommendation³⁰ that governments should invest resources in supporting self-determined Indigenous education policy and programme development related to Indigenous forms of ESE.

In Chapter 4, I examined the enactment of ESD policy in four Manitoba schools. This paper focused on the relationships between actors and material contexts, providing evidence of the ways in which ESD enactment re-makes physical spaces such as school grounds, classrooms, and even the principal's office. It also documents school administrators as refractive actors with respect to ESD policy; the form and extent of policy enactment is heavily mediated by these actors. Research on ESD/ESE policy enactment and school-based leadership is still scant and incomplete (Mogren & Gericke, 2017), and this chapter provides insight into how the practices of school-based actors interact with material contexts to produce particular enactments of ESD policy. There is little research attending to the small-scale, everyday school-based practices that support ESD/ESE policy enactment. In order to better understand how those practices are initiated and maintained in-depth case studies of schools with high sustainability performance are needed.

Research Challenges and Limitations

It is a truism that the best dissertation is a(n adequately) done dissertation. There will always be more stories (Adichie, 2009³¹), more participants to engage, or a more comprehensive analysis resulting in additional chapters. Across all chapters, this dissertation adopted a comparative analytic, with the units of comparison ranging from 215 articles to 4 case study schools. This focus on comparison across contexts and themes necessarily means that some amount of depth is sacrificed.

The literature review work of Chapter 2 focused on literature that explicitly falls within the domain of ESE, in order to make statements about a particular disciplinary field of research. This came at the expense of interdisciplinary insights from fields related to ESE, such as health

³⁰ I qualify this recommendation as “cautious” because while it is critical that Indigenous knowledge/practices/scholarship are supported, it unlikely that current political systems in Canada can support non-paternalistic relations with Indigenous nations. Moreover, the goal should not be to reproduce Indigenous knowledges in formats that render it more easily consumed by non-Indigenous Canadians; in other words, I wish to respect instances of Indigenous refusal (Tuck & Gaztambide-Fernández, 2013).

³¹ This is an intended reference to Chimamanda Ngozi Adichie's 2009 TED talk, in which she discusses the dangers of a single story. It is worth considering which stories were told in this dissertation, through what lenses, and with what effects (and affects).

and wellbeing education, Indigenous education, and multicultural and anti-racist education. Future projects could include a systematic survey of intersections between policy research in each of the above disciplines, and the field of ESE. In addition to peer review research, there is ample documentation of ESE policy efforts in the “grey” literature: non-peer review reports, articles, websites, government white papers, etc. While the focus of Chapter 2 was assessment of *policy research*, there is value in examining documentation of ESE policy. Fortunately, many UN commissioned reports provide useful summaries of national and subnational ESE policy efforts (e.g., Buckler & Creech, 2014; McKenzie, forthcoming; UNESCO, 2014); this also includes Canadian reports to UNESCO (CMEC, 2007, 2014). A systematic assessment of UNESCO reports, including country-specific contributions would be enormously useful for monitoring, evaluation, and ultimately practice carried out in connection with the Decade of ESD, the Global Action Programme (GAP) on ESD, the Sustainable Development Goals, and climate change education efforts related to the UN Climate Change Paris agreement.

The textual analysis in Chapter 3 focused on governance and curriculum policies, which provided the greatest number of comparable documents across contexts. This focus excluded potential insights from subject-specific curricula, for example, Science, Mathematics, and Language Arts. As part of SEPN research, several team members including myself completed a comparative thematic analysis of representative subject-specific curricula for each province. Initially, Chapter 3 was written to include insights from this subject-specific analysis; however, I found that the subject-specific curricula differed too much in scope from the ESE policies to facilitate cross-case (inter-provincial) comparison. Further analysis focusing on comparison amongst document types, particularly in their conceptualizations of the purposes and outcomes of education, as well as the uptake of sustainability into subject-specific curricula, would be useful.

Chapter 4 findings are informed by analysis of policy documents, interview and focus group transcripts, school-based field observations, photo documentation, and ratings of whole school performance from students and school staff. As the only manuscript with field-based components, it offers the most “could have/should have/would have” thoughts with respect to the research process. Overall, the SEPN research team conducted research in a manner to accommodate the school days of our participants. While many school staff were able to dedicate as much time as needed to complete interviews, at other times, our interactions were cut short by classroom and administrative needs. This limitation is the reality of school-based research. In total, my co-researchers and I spent two weeks in four schools in Manitoba with an approximate

total of 30 researcher contact hours with each school. This contact time allowed investigation of the actors, contexts, and mechanisms involved in policy enactment but shed little light on how relationships amongst these components are maintained through everyday practices. Next steps in researching ESE policy enactment could focus on investigation of these micro-processes, potentially drawing on practice theory (Bourdieu & Nice, 1977; Nicolini, 2012) or rhythmanalysis (Christie, 2013; LeFebvre, 2004).

Limitations of the Canadian colonial context. This dissertation did not focus specifically on colonialism and, overall, addressed intersections of sustainability and Indigenous education only in Chapter 3. Nevertheless, it is part of my overall orientation to research ethics and responsibility that I feel compelled to address these issues here. The dynamics of educational policy enactment in Canada are inextricably tied to historical and present-day relationships between Indigenous nations, (historical) settlers and recent newcomers. A remarkably high overall standard of living within Canada obscures deep inequities that shape, among a great many other things, issues of education and sustainability (Truth & Reconciliation Commission, 2015).

The Canadian Truth and Reconciliation Commission (TRC) published a list of calls to action that are intended to serve as guides to the reconciliation process between Indigenous and non-Indigenous peoples living in Canada (2015). For education, this includes a call to incorporate Indigenous knowledges and practices into curriculum and teaching, for Indigenous and non-Indigenous learners. The TRC provides one moral imperative for ESE to better incorporate Indigenous education, but it is not the only one. Decolonization, a process of undoing colonialism and centering Indigenous knowledges (Battiste, 2005; Smith, 1999), also involves the return of land to Indigenous peoples (Simpson, 2014; Tuck & Yang, 2012.) In this way, ESE is intimately linked to Indigenous education: if return of land is a moral imperative, then the forms of education that deal directly with this relationship to land must support this process. I also understand land reparations as a crucial move away from extractive industries that currently threaten not only Indigenous futurities, but also much of life on earth.

Following on the scholarship of Eve Tuck, K.Y. Wang, Rubén Gaztambide-Fernández, and others (e.g. Tuck & Yang, 2012; Tuck & Gaztambide- Fernández, 2013), I find it necessary to ask myself to what extent this dissertation contributes to land reparations, if at all. The institutions and borders of what is currently known as Canada, and the provinces and territories therein, must be re-negotiated, in good faith, and in full respect of all legal traditions operating on this land (Todd, 2014). By completing comparative policy research on education policy within

Canada, this dissertation inadvertently supports (an) illegitimate state(s). I have only begun to think through this challenge in the final stages of completing my dissertation, and I currently have no satisfactory answers. Nevertheless, it is important for me to include this a significant limitation of this research.

Conclusions

In informal conversation during this doctoral research, I occasionally encountered the view that policy does not matter in ESE practice or research; that good ESE work is so far outside the boundaries of the mainstream that it persists in spite of policy, not because of it. There is merit to this opinion, and I share concerns about the limits of acceptable policy discourse and its distance from environmental, social, and economic justice. I am also disappointed in the lofty rhetoric deployed in the opening statements of the ESE policies I analyzed, and the subsequent “dropping of the ball” when it came to pedagogical practice. I am concerned about the diffuse responsibility for environmental harms that surfaced in both policy and practice: references to a general “we” avoided approaching the variegated patterns of destruction and accrued benefits, both at a national and international level. I am concerned that Canadian environmental histories are presented without linkages to historical and present-day colonialism. And, finally, I am concerned that the very necessary pedagogies of hope and action are being created and enacted without adequate space given to grief for socio-ecological losses, for both teachers and students (and policymakers, for that matter).

Despite outlining all of my concerns with ESE policy in Canada, I conclude this dissertation by making a case for its current modest contributions to a sustainable future. I would also note here that ESE is inextricably tied to notions of the purpose of a public education system, and efforts to create a system with fewer over-burdened teachers, more collaboration, and accessible supports for all classrooms/pedagogical places. Through the research processes of this dissertation, I have listened as principals and teachers described meaningful sustainability action within their schools; in many cases, I have noticed the respect and responsibility they accorded students within (and without) their classrooms. Many of these reorientations toward sustainability were only possible through inter-locking layers of policy support, including financial resources, from the school divisions and province. In one instance, I witnessed more substantial transformation than I would have thought possible within a public school, due in part to the synergistic effects of school and divisional policy development. Policy, therefore, can amplify

work done in schools, and, when needed, it can serve as protection against dismantling of programs and staff positions. It can effectively support a stronger web of sustainability actors.

Neither Canadian ESE policy nor practice is currently adequate to the challenge of sustainability: we are facing multiple intersecting crises of climate change, biodiversity loss, disruptions to nutrient cycles, and more (Steffen et al., 2015). As I write this dissertation, however, schools have become sites of climate action in the form of school strikes led by students (CBC Radio 1, 2019; School Strike 4 climate, n.d.; Thunberg, 2019). This is a policy move directed by students, against the current political/educational system. It is a reminder that policy conflict can be a more critical site of transformation than policy creation, as well as an exhortation to leave space for the unexpected.

References

- Adara, O. A. (1996). Strategies of environmental education in social studies in Nigeria by the year 2000, *Environmental Education Research*, 2(2), 237-246.
- Adedayo, A. & Olawepo, J. A. (1997) Integration of environmental education in social science curricula at the secondary school level in Nigeria: problems and prospects, *Environmental Education Research*, 3(1), 83-93.
- Adiche, C. N. (2009). The danger of a single story. *TED talks*. Retrieved from https://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story
- Agyeman, J., Cole, P., Haluza-DeLay, R., & O'Riley, P. (Eds.). (2010). *Speaking for ourselves: Environmental justice in Canada*. Vancouver, BC: UBC Press.
- Aikens, K., McKenzie, M., & Vaughter, P.V. (2016). Environmental and sustainability education policy research: A systematic review of methodological and thematic trends over time. *Environmental Education Research*, 22(3), 333-359.
- Aikens, K., & Hargis, K. (2019). Policy conflicts on the move: A 'mobilities' case study of neoliberal postsecondary policy. *Journal of Education Policy*, 34(1), 22-43.
- Bagoly-Simo, P. (2013). Tracing sustainability: An international comparison of ESD implementation into lower secondary education. *Journal of Education for Sustainable Development*, 7(1), 95-112.
- Bak, N. (1995). Green doesn't always mean go: Possible tensions in the desirability and implementation of environmental education. *Environmental Education Research*, 1(3), 345-352.
- Ball, S. J. (1994). *Education reform: A critical and post-structural approach*. Philadelphia, PA: Open University Press.
- Ball, S. J. (1997). Policy sociology and critical social research: A personal review of recent education policy and policy research. *British Educational Research Journal*, 23(3), 257-274.
- Ball, S. J. (2016). Following policy: Networks, network ethnography and education policy mobilities. *Journal of Education Policy*, 31(5), 549-566.
- Ball, S. J., & Junemann, C. (2012). *Networks, new governance and education*. Bristol, UK: Policy Press.

- Ball, S. J., Maguire, M., & Braun, A. (2012). *How schools do policy: Policy enactments in secondary schools*. London, UK: Routledge.
- Bang, M., Curley, L., Kessel, A., Marin, A., Suzukovich III, E. S., & Strack, G. (2014). Muskrat theories, tobacco in the streets, and living Chicago as Indigenous land. *Environmental Education Research*, 20(1), 37-55.
- Bangay, C., & Blum, N. (2010). Education responses to climate change and quality: Two parts of the same agenda? *International Journal of Educational Development*, 30, 359-368.
- Barraza, L., Duque-Aristizabal, A., & Rebolledo, G. (2003). Environmental education: From policy to practice. *Environmental Education Research*, 9(3), 347-357.
- Barth, M., Fischer, D., Michelsen, G., Nemnich, C., & Rode, H. (2012). Tackling the knowledge-action gap in sustainable consumption: Insights from a participatory school programme. *Journal of Education for Sustainable Development*, 6(2), 301-312.
- Bartlett, L., & Vavrus, F. (2017). *Rethinking case study research: A comparative approach*. New York, NY: Routledge.
- Bartosh, O., Tudor, M., Ferguson, L., & Taylor, C. (2010). Impact of environment-based teaching on student achievement. In D.L. Hough (Ed.), *Research supporting middle grades practice*, (p.157-172) Charlotte, NC: Information Age Publishing.
- Battiste, M. (2005). Post-colonial remedies for protecting Indigenous knowledge and heritage. P. Tripp & L. Muzzin (Eds.), *Teaching as activism. Equity meets environmentalism* (pp. 224-232). Montreal & Kingston, ON: McGill-Queen's University Press.
- Benito, A. E. (2003). The school in the city: School architecture as discourse and as text. *Paedagogica Historica: International Journal of the History of Education*, 39(1), 53-64.
- Bentham, D., Wilson, A., McKenzie, M., & Bradford, L. (in press). Federal underfunding of First Nations education: Translating policy into practice and analyzing implications for sustainability education. *Canadian Journal of Education Administration and Policy*.
- Bernon, G. (1978). Environmental education in Fiji. *The Journal of Environmental Education*, 9(3), 12-17.
- Berryman, T., & Sauvé, L. (2016). Ruling relationships in sustainable development and education for sustainable development. *The Journal of Environmental Education*, 47(2), 104-117.
- Beveridge, D., McKenzie, M., Aikens, K., & Strobbe, K.M. (2019) A national census of sustainability in K-12 education policy: Implications for international monitoring, evaluation, and research. *Canadian Journal of Educational Administration and Policy*,

188, 36-52.

- Bieler, A., Haluza-DeLay, R., Dale, A., & McKenzie, M. (2018). A national overview of climate change education policy: Policy coherence between subnational climate and education policies in Canada (K-12). *Journal of Education for Sustainable Development*, 11(2), 63-85.
- Boeve-de Pauw, J., & Van Petegem, P. (2018). Eco-school evaluation beyond labels: the impact of environmental policy, didactics and nature at school on student outcomes. *Environmental Education Research*, 24(9), 1250-1267.
- Bolscho, D., & Hauenschild, K. (2006). From environmental education to education for sustainable development in Germany. *Environmental Education Research*, 12(1), 7-18.
- Bonnett, M., & Williams, J. (1998). Environmental education and primary children's attitudes toward nature and the environment. *Environmental Education Research*, 28(2), 159-174.
- Bourdieu, P., & Nice, R. (1977). *Outline of a theory of practice* (Vol. 16). Cambridge, UK: Cambridge University Press.
- Bowe, R., Ball, S. J., with Gold, A. (1992). *Reforming education and changing schools*. London, UK: Routledge.
- Braun, A., Maguire, M., & Ball, S. J. (2010). Policy enactments in the UK secondary school: Examining policy, practice and school positioning. *Journal of Education Policy*, 25(4), 547-560.
- Braun, A., Ball, S. J., Maguire, M., & Hoskins, K. (2011). Taking context seriously: Towards explaining policy enactments in the secondary school. *Discourse: Studies in the Cultural Politics of Education*, 32(4), 585-596.
- Breiting, S., & Wickenberg, P. (2010). The progressive development of environmental education in Sweden and Denmark. *Environmental Education Research*, 16(1), 9-37.
- British Columbia, Government of. (n.d.). The British Columbia climate action charter between the province of British Columbia (The Province) and the signatory board of education (Board). Government of British Columbia, Canada.
- British Columbia Ministry of Education. (n.d.). *Environmental learning*. Retrieved from <http://www2.gov.bc.ca/gov/topic.page?id=2E7B5372BE124611B18A785552F2BCF7>
- British Columbia Ministry of Education. (2007). *Environmental learning and experience: An interdisciplinary guide for teachers*. Government of British Columbia, Canada.

- Brown, V. A., Deane, P. M., Harris, J. A., & Russell, J. Y. (2010). Towards a just and sustainable future. In V.A. Brown, J.A. Harris, and J.Y. Russell (Eds.), *Tackling wicked problems: Through the transdisciplinary imagination* (pp. 3-15). New York, NY: Earthscan.
- Brundtland, G. H. (1987). *Our common future: The world commission on environment and development*. Oxford: Oxford University Press.
- Buckler, C., & MacDiarmid, A. (2013). Education for sustainable development in Manitoba: A provincial-wide approach. In R. McKeown and V. Nolet (Eds.), *Schooling for sustainable development in Canada and the United States* (pp. 95-108). Dordrecht, NL: Springer.
- Buckler, C., & Creech, H. (2014). Shaping the future we want: UN Decade of Education for Sustainable Development; final report. Paris, FR: UNESCO. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000230171>
- Canadian Broadcasting Corporation (CBC). (2019, Feb.1). *Cutting class to stop climate change: Young Canadians strike for the planet*. Retrieved from <https://www.cbc.ca/radio/day6/episode-427-mcarthur-pleads-guilty-quebec-tofu-shortage-huawei-indictments-youth-climate-strikes-and-more-1.5001950/cutting-class-to-stop-climate-change-young-canadians-strike-for-the-planet-1.5001974>
- Carr, C. (2014). Discourse yes, implementation maybe: an immobility and paralysis of sustainable development policy. *European Planning Studies*, 22(9), 1824-1840.
- Chapman, J. D., & Aspin, D. N. (2013). A problem-solving approach to addressing current global challenges in education. *British Journal of Educational Studies*, 61(1), 49-62.
- Chopin, N., Hargis, K., & McKenzie, M. (2018). *Building climate-ready schools in Canada: Towards identifying good practices in Climate Change Education*. Sustainability and Education Policy Network, University of Saskatchewan, Saskatoon, Canada.
- Christie, P. (2013). Space, place, and social justice: Developing a rhythmanalysis of education in South Africa. *Qualitative Inquiry*, 19(10), 775-785.
- Clarke, P. (2009). Sustainability and improvement: A problem “of” education and “for” education. *Improving Schools*, 12, 11-17.
- Climate Action 150. (n.d.). Climate Action 150 - A national youth dialogue on climate change. Retrieved from <http://www.climateaction150.ca/>
- Clothey, R., Mills, M., & Baumgarten, J. (2010). A closer look at the impact of globalization on science education. *Cultural Studies of Science Education*, 5, 305-313.

- Coburn, C. E. (2005). Shaping teacher sensemaking: School leaders and the enactment of reading policy. *Educational policy*, 19(3), 476-509.
- Codd, J. (1988). The construction and deconstruction of educational policy documents. *Journal of Educational Policy*, 3(5), 235-248.
- Collier, J. S., & Ong, A. (2005). Global assemblages, anthropological problems. In A. Ong & S.J. Collier (Eds.), *Global assemblages: Technology, politics and ethics as anthropological problems* (pp. 3-21). Malden, MA: Blackwell.
- Council of Ministers of Education, Canada (CMEC). (1999). *Educating for sustainability: The status of sustainable development education in Canada*. Retrieved from <http://www.cmec.ca/Publications/Lists/Publications/Attachments/9/environment.en.pdf>
- Council of Ministers of Education, Canada (CMEC). (2007). *Report to UNECE and UNESCO on indicators of education for sustainable development report for Canada*. Retrieved from <https://www.cmec.ca/Publications/Lists/Publications/Attachments/104/Canada-Report-ESD-2007-10.en.pdf>
- Council of Ministers of Education, Canada (CMEC). (2010). *Report to UNECE and UNESCO on indicators of education for sustainable development report for Canada*. Retrieved from <http://cmec.ca/Publications/Lists/Publications/Attachments/265/esd-canada-report-2007-2010-en.pdf>
- Council of Ministers of Education, Canada (CMEC). (2014). *Canada's response to UNESCO questionnaires on the UN Decade of Education for Sustainable Development, 2005–2014: Education for Sustainable Development after 2014 and UN Decade of ESD. Final report*. Retrieved from <http://www.cmec.ca/Publications/Lists/Publications/Attachments/335/Canada-Response-UNESCO-DESD-2014-Questionnaires-1-and-2-EN.pdf>
- Courtenay-Hall, P., & Lott, S. (1999). Issues of inclusion in developing environmental education policy: Reflections on B.C. experiences. *Canadian Journal of Environmental Education*, 4, 83-103.
- Creech, H., Roy, M., & Buckler, C. (2008). *Environment and sustainable development policy development in K-12 schools in Manitoba and Canada: An initial exploration*. Winnipeg, MB; International Institute for Sustainable Development. Retrieved from http://www.iisd.org/pdf/2008/enviro_sd_policy_schools.pdf

- Dale, R., & Robertson, S. L. (2012). Toward a critical grammar of education policy movements. In G. Steiner-Khamsi & F. Waldow (Eds.), *World yearbook of education 2012: Policy borrowing and lending* (pp. 21-40), London, UK: Routledge.
- Davies, H. T. O., & Nutley, S. M. (2008). Learning more about how research-based knowledge gets used: Guidance in the development of new empirical research. New York, NY: William T. Grant Foundation.
- Dei, G. J., Hall, B. L., & Rosenberg, D. G. (Eds.). (2000). *Indigenous knowledges in global contexts: Multiple readings of our world*. Toronto, ON: University of Toronto Press
- DeLanda, M. (2006). *A new philosophy of society: Assemblage theory and social complexity*. London, UK: A&C Black.
- DeLanda, M. (2016). *Assemblage theory*. Edinburgh, UK: Edinburgh University Press.
- Denzin, N. K. & Lincoln, Y.S. (2011). Introduction: Disciplining the practice of qualitative research. In N.K. Denzin & Y.S. Lincoln (Eds.), *The Sage handbook of qualitative research 4* (pp.1-19). Thousand Oaks, CA: Sage Publishers.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota Press.
- Donald, D. (2012). Indigenous Métissage: A decolonizing research sensibility. *International Journal of Qualitative Studies in Education*, 25(5), 533-555.
- Eacott, S. (2013). Rethinking 'leadership' in education: A research agenda. *Journal of Educational Administration and History*, 45(2), 113-125.
- Eacott, S. (2018). *Beyond leadership*. Singapore: Springer.
- Eames, C., Cowie, B., & Bolstad, R. (2008). An evaluation of characteristics of environmental education practice in New Zealand schools. *Environmental Education Research*, 14(1), 35-51.
- Edwards, A., Sebba, J., & Rickinson, M. (2007). Working with users: Some implications for educational research. *British Educational Research Journal*, 33(5), 647-661.
- Elliot, J. (1999). Sustainable society and environmental education: Future perspectives and demands for the educational system. *Cambridge Journal of Education*, 29(3), 325-340.
- Environics Institute, with the David Suzuki Foundation. (2015). *Focus Canada 2015: Canadian public opinion on climate change*. Final Report, Environics Institute. Retrieved from <https://www.environicsinstitute.org/projects/project-details/focus-canada-2015-canadian-public-opinion-on-climate-change>

- Engel, L. C., & Frizzell, M. O. (2015). Competitive comparison and PISA bragging rights: sub-national uses of the OECD's PISA in Canada and the USA. *Discourse: Studies in the Cultural Politics of Education*, 36(5), 665-682.
- Evans, N., Whitehouse, H., & Gooch, M. (2012). Barriers, successes and enabling practices of education for sustainability in far North Queensland schools: A case study. *The Journal of Environmental Education*, 43(2), 121-138.
- Evers, C. W., & Lakomski, G. (2013). Methodological individualism, educational administration, and leadership. *Journal of Educational Administration and History*, 45(2), 159-173.
- Fallon, G., VanWynsberghe, R., & Robertson, P. (2017). Conceptions of sustainability within the redesigned K-12 curriculum in British Columbia, Canada: Mapping a disputed terrain. *Journal of Sustainability Education*, 16.
- Fay, B. (1975). *Social theory and political practice*. London, UK: Allen and Unwin.
- Feinstein, N. W., Læssøe, J., Blum, N., & Chambers, D. (2013). Challenging the premises of international policy reviews: An introduction to the review symposium. *Environmental Education Research*, 19(2), 198-205.
- Feinstein, N. W., Jacobi, P. R., & Lotz-Sisitka, H. (2013). When does a nation-level analysis make sense? ESD and educational governance in Brazil, South Africa, and the USA. *Environmental Education Research*, 19(2), 218–230.
- Fenwick, T., Edwards, R., & Sawchuk, P. (2011). *Emerging approaches to educational research: Tracing the socio-material*. New York, NY: Routledge.
- Ferguson, T. (2008). “Nature” and the “environment” in Jamaica’s primary school curriculum guides. *Environmental Education Research*, 14(5), 559-577.
- Fontes, P. J. (2004). Action competence as an integrating objective for environmental education. *Canadian Journal of Environmental Education*, 9, 148-162.
- Foucault, M. (1977). *Discipline and punish*. (A. Sheridan, Trans.) New York, NY: Vintage Books.
- Gale, T. (2001). Critical policy sociology: Historiography, archaeology and genealogy as methods of policy analysis. *Journal of Education Policy*, 16(5), 379-393.
- Gayford, C. G., & Dillin, P. J. (1995). Policy and the practice of environmental education in England: A dilemma for teachers. *Environmental Education Research*, 1(2), 173-182.

- Ghent, C., Trauth-Nare, A., Dell, K., & Haines, S. (2014). The influence of a statewide green school initiative on student achievement in K–12 classrooms. *Applied Environmental Education & Communication, 13*(4), 250-260.
- Giroux, H., & McLaren, P. (1986). Teacher education and the politics of engagement: The case for democratic schooling. *Harvard Educational Review, 56*(3), 213-239.
- Gonzalez-Gaudiano, E. J. (1999). Environmental education and sustainable consumption: The case of Mexico. *Canadian Journal of Environmental Education, 4*, 176-192.
- Gonzalez-Gaudiano, E. J. (2006). Environmental education: A field in tension or in transition? *Environmental Education Research, 12*(3), 3-4.
- Gonzalez-Gaudiano, E. J. (2007). Schooling and environment in Latin America in the third millennium. *Environmental Education Research, 13*(2), 155-169.
- Gough, A. (1997). Founders of environmental education: Narratives of the Australian environmental education movement. *Environmental Education Research, 3*(1), 43-57.
- Gough, A. (2011). The Australian-ness of curriculum jigsaws: Where does environmental education fit? *Australian Journal of Environmental Education, 27*(1), 1-15.
- Gruenewald, D. A., & Manteaw, B. O. (2007). Oil and water still: How No Child Left Behind limits and distorts environmental education in US schools. *Environmental Education Research, 13*(2), 171-188.
- Gulson, K. N. (2011). *Education policy, space, and the city*. New York, NY: Routledge.
- Gulson, K. N., & Symes, C. (2007). Knowing one's place: space, theory, education. *Critical Studies in Education, 48*(1), 97-110.
- Gulson, K. N., Lewis, S., Lingard, B., Lubienski, C., Takayama, K., & Webb, P. T. (2017). Policy mobilities and methodology: a proposition for inventive methods in education policy studies. *Critical Studies in Education, 58*(2), 224-241.
- de Haan, G. (2006). The BLK “21” programme in Germany: A “gestaltungskompetenz”-based model for Education for Sustainable Development. *Environmental Education Research, 12*(1), 19-32.
- Hägglund, S., & Samuelsson I. P. (2009). Early childhood education and learning for sustainable development and citizenship. *International Journal of Early Childhood, 41*(2), 49-63.
- Hale, S. (2010). The new politics of climate change: Why we are failing and how we will succeed. *Environmental Politics, 19*(2), 255-275.

- Hankivsky, O. (Ed.). (2012). An intersectionality-based policy analysis framework. Vancouver Institute for Intersectionality Research and Policy. Vancouver, BC: Simon Fraser University.
- Hankivsky, O., Grace, D., Hunting, G., Giesbrecht, M., Fridkin, A., Rudrum, S., Ferlatte, O., & Clark, N. (2014). An intersectionality-based policy analysis framework: Critical reflections on a methodology for advancing equity. *International Journal for Equity in Health, 13*, 119.
- Hart, P., & Nolan, K. (1999). A critical analysis of research in environment education. *Critical Studies in Science Education, 34*(1), 1-69.
- Heimans, S. (2012). Coming to matter in practice: Enacting education policy. *Discourse: Studies in the Cultural Politics of Education, 33*, 313-326.
- Heimans, S. (2014). Education policy enactment research: Disrupting continuities. *Discourse: Studies in the Cultural Politics of Education, 35*(2), 306-317.
- Hepburn, M. A., & Keach, Jr., E. T. (1974). The impact of environmentalism on the social studies curriculum. *The Journal of Environmental Education, 5*(3), 15-18.
- Henderson, K., & Tilbury, D. (2004). *Whole-school approaches to sustainability: An international review of sustainable school programs*. Canberra, Australia: Australian Government Department of the Environment and Heritage and the Australian Research Institute in Education for Sustainability (ARIES).
- Huckle, J. (2008). An analysis of New Labour's policy on education for sustainable development with particular reference to socially critical approaches. *Environmental Education Research, 14*(1), 65-75.
- Huckle, J. (2009). Consulting the UK ESD community on an ESD indicator to recommend to government: An insight into the micro-politics of ESD. *Environmental Education Research, 15*(1), 1-15.
- Huckle, J., & Wals, A. E. J. (2015). The UN Decade of Education for Sustainable Development: Business as usual in the end. *Environmental Education Research, 21*(3), 491-505.
- Hursh, D., & Henderson, J. (2011). Contesting global neoliberalism and creating alternative futures. *Discourse: Studies in the Cultural Politics of Education, 32*(2), 171-185.
- Ingold, T. (2011). *Being alive: Essays on movement, knowledge and description*. New York, NY: Routledge.

- International Institute for Sustainable Development (IISD) & Manitoba Department of Education and Training. (2016). *Guide for Sustainable Schools in Manitoba, 2nd Edition*. Winnipeg, MB. Retrieved from https://www.edu.gov.mb.ca/k12/esd/pdfs/sustainable_guide.pdf
- Iyengar, R., & Bajaj, M. (2011). After the smoke clears: Toward Education for Sustainable Development in Bhopal, India. *Comparative Education Review*, 55(3), 424-456.
- Jickling, B. (1992). Why I don't want my children to be educated for sustainable development. *The Journal of Environmental Education*, 23(4), 5-8.
- Jickling, B., & Wals, A. E. (2008). Globalization and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies*, 40(1), 1-21.
- Jickling, B., Sauv , L., Bri re, L., Niblett, B., & Root, E. (2010). The 5th World Environmental Education Congress, 2009: A research project. *Canadian Journal of Environmental Education*, 15, 47-67.
- J hannesson, I. A., Noro dahl, K.,  skarsd ttir, G., P lsd ttir, A. & P tursd ttir, B. (2011). Curriculum analysis and education for sustainable development in Iceland. *Environmental Education Research*, 17(3), 375-391.
- Jucker, R. (2011). ESD between systemic change and bureaucratic obfuscation: Some reflections on environmental education and Education for Sustainable Development in Switzerland. *Journal of Education for Sustainable Development*, 5, 39-60.
- Kadji-Beltran, C., Zachariou, A., & Stevenson, R. B. (2013). Leading sustainable schools: exploring the role of primary school principals. *Environmental Education Research*, 19(3), 303-323.
- Kennelly, J., Taylor, N., & Jenkins, K. (2008). Listening to teachers: Teacher and student roles in the New South Wales Sustainable Schools Programme. *Environmental Education Research*, 14(1), 53-64.
- Kennelly, J., Taylor, N., & Serow, P. (2011). Education for sustainability and the Australian curriculum. *Australian Journal of Environmental Education*, 27(2), 209-218.
- Kingdon, J. W. (1984). *Agendas, alternatives, and public policies*. Boston, MA: Little, Brown and Company.
- Kopnina, H. (2012). Education for sustainable development (ESD): The turn away from “environment” in environmental education? *Environmental Education Research*, 18(5), 699-717.

- Koyama, J. (2015). When things come undone: The promise of disassembling education policy. *Discourse: Studies in the Cultural Politics of Education*, 36(4), 548-559.
- Kunuk, Z., & Mauro, I. 2010. Inuit knowledge and climate change. Retrieved from <http://www.isuma.tv/en/inuit-knowledge-and-climate-change>
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, U.N. Doc FCCC/CP/1997/7/Add.1, 37 I.L.M. 22 (1998).
- Læssøe, J., Feinstein, N.W., & Blum, N. (2013). Environmental education policy research – Challenges and ways research might cope with them. *Environmental Education Research*, 19(2), 231-242.
- Latour, B. (2004). Why has critique run out of steam? From matters of fact to matters of concern. *Critical Inquiry*, 30(2), 225-248.
- Latour, B. (2005). From realpolitik to dingpolitik or how to make things public. In B. Latour & P. Weibel (Eds.), *Making things public: Atmospheres of democracy* (pp. 14-43). Cambridge, MA: MIT Press.
- Lee, J. C. K. (1997). Environmental education in schools in Hong Kong. *Environmental Education Research*, 3(3), 359-371.
- Lefebvre, H. (2004). *Rhythmanalysis: Space, time and everyday life*. London, UK: Continuum.
- Leithwood, K., Harris, A., & Hopkins, D. (2008). Seven strong claims about successful school leadership. *School Leadership and Management*, 28(1), 27-42.
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 45(2), 123-152.
- Lingard, B. & Ozga, J. (2007). Introduction: Reading education policy & politics. In B. Lingard, & J. Ozga (Eds.), *The RoutledgeFalmer reader in education policy and politics* (pp. 1-8). Oxon, UK: Routledge.
- Locke, S. (2009). Environmental education for democracy and social justice in Costa Rica. *International Research in Geographical and Environmental Education*, 18(2), 97-110.
- Lotz-Sisitka, H. (2009). How many declarations do we need? Inside the drafting of the Bonn Declaration on education for sustainable development. *Journal of Education for Sustainable Development*, 3, 205-210.

- Major, C. H., & Savin-Baden, M. (2010). Qualitative research synthesis: The scholarship of integrated practice. In M. Savin-Baden and C. H. Major (Eds.), *New approaches to qualitative research: Wisdom and uncertainty* (pp. 108-118). New York, NY: Routledge.
- Manitoba Department of Education and Training. (2000). *Education for a sustainable future: A resource for curriculum developers, teachers, and administrators*. Winnipeg, MB: Government of Manitoba.
- Manitoba Department of Education and Training. (2015). *Manitoba Education and Advanced Learning Annual Report, 2014-15*. Winnipeg, MB: Government of Manitoba.
- Manitoba Department of Education and Training. (2016). *Manitoba Education and Advanced Learning Annual Report, 2015-16*. Winnipeg, MB: Government of Manitoba.
- Manitoba Department of Education and Training. (n.d.-a). *Mandate, mission, vision, and priority areas*. Retrieved from <https://www.edu.gov.mb.ca/edu/mandate.html>
- Manitoba Department of Education and Training. (n.d.-b). *Education for sustainable development in Manitoba Education and Advanced Learning*. Retrieved from https://www.edu.gov.mb.ca/k12/esd/pdfs/esd_mb.pdf
- Manitoba Department of Education and Training. (n.d.-c). *Eco-Globe Schools: Recognizing education for sustainable development in kindergarten to grade 12 schools*. Retrieved from https://www.edu.gov.mb.ca/k12/esd/eco_globe/index.html
- Mannion, G., Biesta, G., Priestley, M., & Ross, H. (2011). The global dimension in education and education for global citizenship: Genealogy and critique. *Globalisation, Societies and Education*, 9(3-4), 443–456.
- Marsh, D., & Evans, M. (2012). Policy transfer: coming of age and learning from the experience. *Policy Studies*, 33(6), 477-481.
- Martina, C., Hursh, D., & Markowitz, D. (2009). Contradictions in educational policy: Implementing integrated problem-based environmental health curriculum in a high stakes environment. *Environmental Education Research*, 15(3), 279-297.
- Masson-Delmotte, V., Zhai, P., Pörtner, H. O., Roberts, D., Skea, J., Shukla, P. R., & Waterfield, T. (2018). Global warming of 1.5 C: An IPCC Special Report on the impacts of global warming of 1.5 C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Intergovernmental Panel on Climate Change.

- Massey, D. (1994). A global sense of place. In *Space, place, and gender* (pp. 146-156). Minneapolis, MN: University of Minnesota Press.
- Massey, D. (2005). *For space*. Thousand Oaks, CA: Sage Publishers.
- McCann, E., & Ward, K. (2012). Policy assemblages, mobilities and mutations: Toward a multidisciplinary conversation. *Political Studies Review*, 10(3), 325-332.
- McKenzie, M. (2009). Scholarship as intervention: Critique, collaboration and the research imagination. *Environmental Education Research*, 15(2), 217–226.
- McKenzie, M. (2012). Education for y'all: Global neoliberalism and the case for a politics of scale in sustainability education policy. *Policy Futures in Education*, 10(2), 165-177.
- McKenzie, M., Bieler, A., & McNeil, R. (2015). Education policy mobility: Reimagining sustainability in neoliberal times. *Environmental Education Research*, 21(3), 319-337.
- McKenzie, M. *Global reporting on climate change*. A report to UNESCO and UN Climate Change. Report forthcoming.
- McKenzie, M., & Aikens, K. The interscalar mobilities of education policy: A comparative case study of sustainability in K-12 education. Manuscript forthcoming.
- McKeown, R., & Hopkins, C. (2007). Moving beyond the EE and ESD disciplinary debate in formal education. *Journal of Education for Sustainable Development*, 1(1), 17-26.
- McKeown, R., & Nolet, V. (Eds.). (2013). *Schooling for sustainable development in Canada and the United States*. Dordrecht, The Netherlands: Springer.
- McLean, B. L., & Borén, T. (2015). Barriers to implementing sustainability locally: A case study of policy immobilities. *Local Environment*, 20(12), 1489-1506.
- McNaughton, M. J. (2007). Sustainable development education in Scottish schools: The Sleeping Beauty syndrome. *Environmental Education Research*, 13(5), 621-638.
- Meyer, H. D., & Benavot, A. (Eds.). (2013). *PISA, power, and policy: The emergence of global educational governance*. Oxford, UK: Symposium Books Ltd.
- Mildenberger, M., Howe, P., Lachapelle, E., Stokes, L., Marlon, J., & Gravelle, T. (2016). The distribution of climate change public opinion in Canada. *PloS one*, 11(8), e0159774.
- Mintrom, M. (1997). Policy entrepreneurs and the diffusion of innovation. *American Journal of Political Science*, 41(3), 738-70.
- Mogren, A., & Gericke, N. (2017). ESD implementation at the school organisation level, part 1—investigating the quality criteria guiding school leaders' work at recognized ESD schools. *Environmental Education Research*, 23(7), 972-992.

- Mokuku, T., Jobo, M. E., Raselimo, M., Mathafeng, T., & Stark, K. (2005). Encountering paradigmatic tensions and shifts in environmental education. *Canadian Journal of Environmental Education, 10*, 157-172.
- Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2017). Identifying effective climate change education strategies: a systematic review of the research. *Environmental Education Research*, doi: 10.1080/13504622.2017.1360842.
- Mucunguzi, P. (1995). Environmental education in the formal sector of education in Uganda. *Environmental Education Research, 1*(2), 233-240.
- Mulcahy, D. (2015). Re/assembling spaces of learning in Victorian government schools: Policy enactments, pedagogic encounters and micropolitics. *Discourse: studies in the cultural politics of education, 36*(4), 500-514.
- Nakata, M. (2002). Indigenous knowledge and the cultural interface: Underlying issues at the intersection of knowledge and information systems. *IFLA Journal, 28*(5-6), 281-291.
- Nam, S. -J. (1995). Environmental education in primary and secondary schools in Korea: Current developments and future agendas. *Environmental Education Research, 1*(1), 109-122.
- Nazir, J., Pedretti, E., Wallace, J., Montemurro, D., & Inwood, H. (2009). *Climate change and sustainable development: The response from education. The Canadian Perspective*. Centre for Science, Mathematics and Technology Education, Ontario Institute for Studies in Education, University of Toronto, Ontario, Canada.
- 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.
- Newton, P., & Riveros, A. (2015). Toward an ontology of practices in educational administration: Theoretical implications for research and practice. *Educational Philosophy and Theory, 47*(4), 330-341.
- Nicolini, D. (2012). *Practice theory, work, and organization: An introduction*. Oxford, UK: OUP Oxford.
- Nixon, J., Sankey, K., Furay, V., & Simmons, M. (1999). Education for sustainability in Scottish secondary schools: Boundary maintenance or professional reorientation? *Environmental Education Research, 5*(3), 305-318.

- Northwest Territories Department of Education, Culture, and Employment. (1996). *Innuuqatigiit: The Curriculum from the Inuit perspective*. Government of the Northwest Territories, Canada.
- Nunavut Department of Education. (2007). *Inuit Qaujimagatuqangit education framework for Nunavut curriculum*. Government of Nunavut, Canada.
- Ong, A., & Collier, S. J. (Eds.). (2008). *Global assemblages: Technology, politics, and ethics as anthropological problems*. John Wiley & Sons.
- Ontario Ministry of Education. (2008). *Standards for environmental education in the curriculum*. Government of Ontario, Canada.
- Ontario Ministry of Education. (2009). *Acting today, shaping tomorrow: A policy framework for environmental education in Ontario Schools*. Government of Ontario, Canada.
- Ontario Ministry of Education. (2012). *Statement of environmental values*. Toronto, ON: Government of Ontario. Government of Ontario, Canada.
- Ozga, J. (2000). *Policy research in educational settings: Contested terrain*. Buckingham, UK: Open University Press.
- Pace, P. (1997). Environmental Education in Malta: Trends and challenges, *Environmental Education Research*, 3(1), 69-82.
- Payne, P. G. (2016). The politics of environmental education. Critical inquiry and education for sustainable development. *The Journal of Environmental Education*, 47(2), 69-76.
- Palmer, J. A. (1999). Research Matters: A call for the application of empirical evidence to the task of improving the quality and impact of environmental education. *Cambridge Journal of Education*, 29(3), 379-395.
- Peck, J. (2011). Geographies of policy: From transfer-diffusion to mobility-mutation. *Progress in Human Geography*, 35(6), 773-797.
- Peck, J., & Theodore, N. (2010). Mobilizing policy: Models, methods, and mutations. *Geoforum*, 41, 169-174.
- Peck, J., & Theodore, N. (2012). Follow the policy: A distended case approach. *Environment and Planning A*, 44(1), 21-30.
- Peck, J., & Theodore, N. (2015). *Fast policy: Experimental statecraft at the thresholds of neoliberalism*. Minneapolis, MN: University of Minnesota Press.
- Pinto, L. E. (2012). Hidden privatization in education policy as “quick fixes” by “hired guns”: Contracting curriculum policy in Ontario. *Critical Policy Studies*, 6(3), 261- 281.

- Plant, M. (1995). The riddle of sustainable development and the role of environmental education. *Environmental Education Research*, 1(3), 253-266.
- Posch, P. (1999). The ecologisation of schools and its implications for educational policy. *Cambridge Journal of Education*, 29(3), 341-348.
- Programme of International Student Assessment (PISA). (2018). *PISA 2018 global competence*. Retrieved from <http://www.oecd.org/pisa/pisa-2018-global-competence.htm>
- Prunty, J. (1985). Signposts for a critical educational policy analysis. *Australian Journal of Education*, 29(2), 133-140.
- Puk, T., & Behm, D. (2003). The diluted curriculum: The role of government in developing ecological literacy as the first imperative in Ontario secondary schools. *Canadian Journal of Environmental Education*, 8, 217-232.
- Québec Ministry of Education and Higher Education- Ministère de l'Éducation et de l'Enseignement Supérieur. (2008). *Action plan for sustainable development- Plan d'action de développement durable*. Québec, QC: Government of Québec.
- Reid, A., & Scott, W. (2008). Researching education and the environment: Retrospect and prospect. In A. Reid and W. Scott (Eds.) *Researching education and the environment: Retrospect and prospect* (pp. 325-341). Abingdon, UK: Routledge.
- Renton, Z., & Butcher, J. (2010). Securing a sustainable future for children and young people. *Children & Society*, 24, 160-166.
- Rickinson, M., Sebba, J., & Edwards, A. (2011). *Improving research through user engagement*. London, UK: Routledge.
- Riggan, M., & Supovitz, J. A. (2008). Interpreting, supporting, and resisting change: the geography of leadership in reform settings. In J. A. Supovitz & E. H. Weinbaum (Eds.), *The implementation gap: Understanding reform in high schools* (pp. 103-125). New York, NY: Teachers College Press.
- Rinaldi, C. (2004). *In dialogue with Reggio Emilia: Listening, researching and learning*. New York, NY: Routledge.
- Riveros, A. (2018). Thinking relationally about the “school leader”. In S. Eacott (Ed.) *Beyond leadership* (pp. 231-241). Singapore: Springer.
- Riveros, A., & Viczko, M. (2015). The enactment of professional learning policies: Performativity and multiple ontologies. *Discourse: Studies in the Cultural Politics of Education*, 36(4), 533-547.

- Riveros, A., Verret, C., & Wei, W. (2016). The translation of leadership standards into leadership practices: A qualitative analysis of the adoption of the Ontario Leadership Framework in urban schools. *Journal of Educational Administration*, 54(5), 593-608.
- Rizvi, F., & Lingard, B. (2010). *Globalizing education policy*. London, UK: Routledge.
- Robottom, I., & Stevenson, R. B. (2013). Analyses of environmental education discourses and policies. In R. B. Stevenson, M. Brody, J. Dillon, & A. E. J. Wals (Eds.), *International handbook of research in environmental education* (pp. 123-125). New York, NY: Routledge.
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin III, F. S., Lambin, E., ... & Nykvist, B. (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and society*, 14(2), 472-475.
- Sahlberg, P., & Oldroyd, D. (2010). Pedagogy for economic competitiveness and sustainable development. *European Journal of Education*, 45(2), 280-299.
- Savage, G. C., & Lewis, S. (2018). The phantom national? Assembling national teaching standards in Australia's federal system. *Journal of Education Policy*, 33(1), 118-142.
- Sauvé, L. (1996). Environmental education and sustainable development: A further appraisal. *Canadian Journal of Environmental Education*, 1, 7-34.
- Sauvé, L., & Berryman, T. (2005). Challenging a "closing circle": Alternative research agendas for the ESD Decade. *Applied Environmental Education & Communication*, 4(3), 229-232.
- 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, 33-54.
- Scheunpflug, A., & Asbrand, B. (2006). Global education and education for sustainability. *Environmental Education Research*, 12(1), 33-46.
- Schoenfeld, C. (1975). National environmental education perspective. *The Journal of Environmental Education*, 7(2), 9-10.
- School Strike for Climate, Australia. (n.d.). *School strike for climate*. Retrieved from <https://www.schoolstrike4climate.com/>
- Scott, W. (2013). Developing the sustainable school: Thinking the issues through. *Curriculum Journal*, 24(2), 181-205.

- Scott, W., & Reid, A. (1998). The revisioning of environmental education: A critical analysis of recent policy shifts in England and Wales. *Environmental Education Research*, 50(3), 213-223.
- Sellar, S., Savage, G. C., & Radhika, G. (2014). The politics of disagreement in critical education policy studies: A response to Morsey, Gulson and Clarke. *Discourse: Studies in the Cultural Politics of Education*, 35(3), 462-469.
- SEPN (Sustainability and Education Policy Network). (2019). *Evaluation of ESE policy and practice in 20 case study schools in Canada* (working title). Report of the Sustainability and Education Policy Network, Saskatoon, SK.
- Shava, S. (2013). The representation of Indigenous knowledges. In R. B. Stevenson, M. Brody, J. Dillon, & A. E. J. Wals (Eds.), *International handbook of research in environmental education* (pp. 384-393). New York, NY: Routledge.
- Sheller, M., & Urry, J. (2006). The new mobilities paradigm. *Environment and Planning A*, 38, 207-226.
- Simons, M., Olssen, M., & Peters, M. A. (2009) *Re-reading education policies: A handbook studying the policy agenda of the 21st century*. Rotterdam, NL: Sense Publishers.
- Simpson, L. B. (2014). Land as pedagogy: Nishnaabeg intelligence and rebellious transformation. *Decolonization: Indigeneity, Education & Society*, 3(3), 1-25.
- Singh, M. (1998). Critical literacies for environmental educators. *Environmental Education Research*, 4(3), 341-354.
- Singh, P., Heimans, S., & Glasswell, K. (2014). Policy enactment, context and performativity: ontological politics and researching Australian National Partnership policies. *Journal of Education Policy*, 29(6), 826-844.
- Smith, L. T. (1999). *Decolonizing methodologies: Research and Indigenous peoples*. New York, NY: Zed.
- Smyth, J. (1995). Environment and education: A view of a changing scene. *Environmental Education Research*, 1(1), 3-20
- Smyth, J. (1999). Is there a future for education consistent with Agenda 21? *Canadian Journal of Environmental Education*, 4, 69-83.
- Snaza, N. & Weaver, J. A. (2015). Introduction: Education and the posthumanist turn. In N. Snaza & J. A. Weaver (Eds.), *Posthumanism and Educational Research* (pp. 1-14). New York, NY: Routledge.

- Spillane, J. P. (2004). *Standards deviation: How schools misunderstand education policy*. Cambridge, MA: Harvard University Press.
- Spillane, J. P. (2005). Distributed leadership. *The Educational Forum*, 69, 143–150.
- Stapp, W. B. (1976). International Environmental Education: The UNESCO-UNEP Programme. *The Journal of Environmental Education*, 8(2), 19-25.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... & Folke, C. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 1259855.
- Stevenson, R. B. (2007). Schooling and environmental/sustainability education: From discourses of policy and practice to discourses of professional learning. *Environmental Education Research*, 13(2), 265-285.
- Stevenson, R. B. (2013). Researching tensions and pretensions in environmental/ sustainability education policies: From critical to civically engaged policy scholarship. In R. B. Stevenson, M. Brody, J. Dillon, & A. E. J. Wals (Eds.), *International handbook of research in environmental education* (pp. 147–155). New York, NY: Routledge.
- Stevenson, R. B., Brody, M., Dillon, J., & Wals, A. E. J. (Eds.). (2013). *International handbook of research on environmental education*. New York, NY: Routledge.
- Stimpson, P. G. (1997). Environmental challenge and curricular responses in Hong Kong. *Environmental Education Research*, 3(3), 345-357.
- Stimpson, P. G., & Kwan, F. W. B. (2001). Environmental education in Guangzhou in the People's Republic of China: Global theme, politically determined. *Environmental Education Research*, 7(4), 397-412.
- Swayze, N., & Creech, H. (2009). *Sustainability policies at the school division level in Manitoba: The status of policy development and its relationship to actions in schools*. International Institute for Sustainable Development, Winnipeg, MB. Retrieved from http://www.iisd.org/pdf/2009/sd_policies_mb_school_division.pdf
- Sykes, G., Schneider, B., & Plank, D. N. (Eds.). (2009). *Handbook of education policy research*. New York, NY: Routledge.
- Taylor, S., Rizvi, F., Lingard, B., & Henry, M. (1997). *Educational policy and the politics of change*. London, UK: Routledge.

- Temenos, C., & McCann, E. (2012). The local politics of policy mobility: Learning, persuasion, and the production of a municipal sustainability fix. *Environment and Planning A*, 44(6), 1389-1406.
- Temenos, C., & McCann, E. (2013). Geographies of policy mobilities. *Geography Compass*, 7(5), 344-357.
- Thrupp, M., & Lupton, R. (2006). Taking school contexts more seriously: The social justice challenge. *British Journal of Educational Studies*, 54(3), 308-328.
- Thunberg, G. (2019). *The disarming case to act right now on climate change*. TEDxStockholm. Retrieved from https://www.ted.com/talks/greta_thunberg_the_disarming_case_to_act_right_now_on_climate?fbclid=IwAR09uwVZSKR0KFstwJbZ4UnTytOs5znmIt9qO0m6WTnK7Ka0rrkdt6uRUpY
- Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research*, 1(2), 195-212.
- Todd, Z. (2014). Fish pluralities: Human-animal relations and sites of engagement in Paulatuq, Arctic Canada. *Etudes/Inuit/Studies*, 38(1-2), 217-238.
- Truth and Reconciliation Commission. (2015). *Truth and Reconciliation Commission: Calls to action*. Winnipeg MB: Truth and Winnipeg, MB: TRC 2015
- Tuck, E., & Yang, K. W. (2012). Decolonization is not a metaphor. *Decolonization: Indigeneity, Education & Society*, 1(1), 1-40.
- Tuck, E., & Gaztambide-Fernández, R. A. (2013). Curriculum, replacement, and settler futurity. *Journal of Curriculum Theorizing*, 29, 72-89.
- Tuck, E., McKenzie, M., & McCoy, K. (2014). Land education: Indigenous, post-colonial, and decolonizing perspectives on place and environmental education research. *Environmental Education Research*, 20(1), 1-23.
- Tuck, E., & McKenzie, M. (2015). *Place in research: Theory, methodology, methods*. New York, NY: Routledge.
- United Nations (UN). (2000). *Millennium development goals: Progress report*. Place of publication not identified: UN Dept. of Economic and Social Affairs
- United Nations (UN). (2015). *Sustainable development goals*. Retrieved from <https://sustainabledevelopment.un.org/sdg4>

- United Nations Conference on Environment and Development. (1992). *Agenda 21, Rio Declaration, Forest Principles*. New York, NY: United Nations.
- United Nations Educational, Scientific and Cultural Organisation (UNESCO). (2005). *United Nations Decade of Education for Sustainable Development (2005–14): International Implementation Scheme*. Paris: UNESCO.
- United Nations Educational, Scientific and Cultural Organisation (UNESCO). (n.d.). *Associated Schools Network: About the network*. Retrieved from https://aspnet.unesco.org/en-us/Pages/About_the_network.aspx
- United Nations Educational, Scientific and Cultural Organization (UNESCO). (2014). *UNESCO roadmap for implementing the Global Action Programme on Education for Sustainable Development*. Paris: UNESCO.
- United Nations Educational, Scientific and Cultural Organisation- United Nations Environment Programme (UNESCO-UNEP). (1978). *Recommendations of the intergovernmental conference on environmental education, Tbilisi, USSR*. Paris: UNESCO.
- Urry, J. (2007). *Mobilities*. Cambridge, UK: Polity Press.
- Van Poeck, K., & Lysgaard, J. A. (2016). The roots and routes of environmental and sustainability education policy research. *Environmental Education Research*, 22(3), 305-318.
- Van Poeck, K., Vandenabeele, J., & Bruyninckx, H. (2013). Taking stock of the UN Decade of Education for Sustainable Development: The policy-making process in Flanders. *Environmental Education Research*, 20(5), 695-717.
- Vare, P. (1998). ECoSA: A report on a pan-African environmental education survey. *Environmental Education Research*, 4(1), 5-24.
- Viertel, E. (2010). Vocational education for sustainability: An obligation for the European Trading Foundation. *European Journal of Education*, 45(2), 217-235.
- Vizina, Y., (2018). Indigenous knowledges and sustainability in post-secondary Education. University of Saskatchewan, College of Graduate Studies Research.
- Wals, A. E. J. (2012). *Shaping the education of tomorrow: 2012 full-length report on the UN decade of education for sustainable development*. Paris, FR: UNESCO. Retrieved from <https://library.wur.nl/WebQuery/wurpubs/fulltext/246667>
- Wals, A. E. J., & Kieft, G. (2010). *Education for sustainable development: Research overview* (No. 2010: 13). Stockholm: Swedish International Development Agency.

- Watt-Cloutier, S. (2015). *The right to be cold: One woman's story of protecting her culture, the Arctic and the whole planet*. Toronto, ON: Penguin Canada.
- Watts, V. (2013). Indigenous place-thought and agency amongst humans and non humans (First Woman and Sky Woman go on a European world tour!). *Decolonization: Indigeneity, Education & Society*, 2(1), 20-34.
- Whitehouse, H. (2001). 'Not greenies' at school: Investigating the discourses of environmental activism in regional Australia. *Australian Journal of Environmental Education*, 17, 71-76.
- Wiek, A., Withycombe, L., & Redman, C., (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science*, 6(2), 203-218.
- Youdell, D. (2010). *School trouble: Identity, power and politics in education*. New York, NY: Routledge.

Appendices

Appendix A. Interview Protocol



SITE ANALYSIS INTERVIEW PROTOCOL

Researcher Note:

- *Maintain focus throughout interview on institution for PSE (e.g., sustainability research at institution more broadly vs that of faculty being interviewed, broader than curriculum in one program, etc.). Ministry, SD, and School participants at K-12 may focus on policies and practices across those levels from their position within any one of the three.*

Researcher Note:

- *Interview begins with introductions. Then move to consent form - give them a minute to review and then ask if they have any questions. After participant and researcher sign both copies (interviewee keeps one), let participants know you are turning on recorders.*
- *Note that most provinces should include a recognition of only First Nations and Métis, and territories should include Inuit and First Nations in some cases. In phone interviews, modify first sentence of interview to say 'on which we are both located' vs. 'on which we are meeting.'*

Introduction

To open our discussion, we would like to acknowledge the traditional First Nations, Métis, and/or Inuit territories on which we are meeting.

We will start this interview with a survey that will ask you to evaluate your [setting's] work regarding sustainability policy and practice. We will then ask you some follow up questions. Please note that we will be following a formal structure of questions, as this format needs to be consistent across our nation-wide study. Please answer to the best of your knowledge, there are no right or wrong answers.

Here is an iPad [document if app not available] on which we'd like you to answer some questions to start. At the beginning you will see some basic information about sustainability, as well as demographic information - if you're able to take a few minutes now and complete this, that would be great.

In the next part, we're going to use a heat diagram to ask you about your experiences of how policies and practices developed in your setting. Would you describe yourself as more familiar with policy or with practice in this setting?

Researcher Note: If participant describes themselves as more familiar with practice, go to section 1; if policy, go to section 2. For participants that are less familiar with practice, use only the questions (and prompts, as needed) under Box 1. For participants that are less familiar with policy, use only the questions (and prompts, as needed) under Box 2. If a participant is familiar with both practice AND policy within a setting (e.g. Sustainability Officer, others) and time allows, can use full protocol for each of practice and policy.

Section 1: Sustainability Practices

Introduction to Heat Diagram

Researcher Note: For phone interviews, please go through each domain at a time, beginning with governance, curriculum, research, community outreach, operations, and other to enter their ratings and get any short examples.

To start, please rate your setting's activity in relation to sustainability practice across several domains using this diagram.

To explain the task a bit, we are defining "sustainability" as including, at minimum, consideration of the natural environment. When we use the word "practice," we mean any practices or activities in your setting that engage with sustainability (be they led by administration, faculty/teachers, students, community, etc.).

We'd like you to please rate your setting's activity in relation to existing practices that address sustainability across the domains of: overall governance, curriculum and teaching, research, community outreach, facilities operations, and 'other' - explanations of these domains are included on the diagram.

Please assign a number from 0-10 for sustainability practices in each of these areas, with '0' indicating little to no sustainability practice in that domain, what we are referring to as 'cool,' and '10' indicating a 'hot' domain of sustainability practice for your setting. Please also add any details of what you have in mind in giving that rating. In other words, types of practice initiatives you may be thinking of in that area.

These are your own ratings based on your experiences and impressions. If you're really not sure, you can simply indicate 'don't know.' Do you have any questions? Would you like clarification on any of the categories?

Questions for those 'Less Familiar' with Practice [replaces questions 1-3]

Box 1. Researcher Note: If the participant has selected practice as the context with which they are LESS familiar, ask them the following questions. *If the participant appears familiar with the practices described and time allows, include regular follow-up probes in relation to the questions below (from 'more familiar' section). Also include questions on 'cool' domain below unless time is short; then move on directly to Section 3: General.*

In your ratings diagram, can you please choose one of the 'hottest' rated domains to discuss in relation to practice?
[Ensure participant or researcher says out loud which domain they choose]

- Can you tell us about your general impressions of practice in this domain?
- Is there a particular practice or practices that you were thinking of when you decided to give this rating?
- **Origins:** Do you know why your setting decided to begin this sustainability practice?
- **Mobility:** Are you aware of any practices or policies elsewhere that influenced its adoption (regionally, nationally, or internationally)?
- **Actors:** Can you tell us about any of the actors involved in this practice, champions or others?
- How successful has this practice been, in your estimation?

Can you now please choose one of the more 'cool' rated domains to discuss as an area with relatively low levels of practice?

- Can you tell us about your impressions of sustainability practice or lack thereof in this domain?
- What kinds of factors do you think have made the development of sustainability practice challenging in this domain?
- Do you have anything else to add on this topic, or otherwise in relation to practice, before we move on?

Questions for Domains with 'Hot' Ratings for those 'More Familiar' with Practice

Researcher Note: If the participant has selected practice as the context with which they are MORE familiar, please ask all of the following before moving on to Box 2 for policy.

1. In your ratings diagram, can you please choose one of the 'hottest' rated domains to discuss in relation to good practice? [Ensure participant or researcher says out loud which domain they choose]
 - (a) Can you tell us about your general impressions of practice in this domain?
 - (b) Is there a particular practice or practices that you were thinking of when you decided to give this rating?

2. **Practice Origins:** Can you please pick one of these practices to tell us about in some depth and I'll ask you some further questions on it.
 - (a) **Drivers:**
 - a. To your knowledge why did your setting decide to begin this sustainability practice?
 - b. What influenced its development?
 - (b) **Mobility:**
 - a. Are you aware of any practices or policies elsewhere that influenced its adoption? For example, at another location or in another province or territory?
 - b. What about national or international influences, for example through various networks, associations, or policy bodies?
 - (c) **Actors:** Now I have some questions about any key people involved in developing this sustainability practice in your setting; people either based here or elsewhere:
 - a. Were there any champions or leaders in moving it forward?
 - b. Did anyone from outside your setting influence the development of the practice?
 - c. Were there any resisters to this practice? Or perhaps some that had hesitations? How so?
 - d. Do you know if students played a role in developing this practice? How so?
 - e. What about faculty and staff?
 - f. How would you describe the diversity of those involved, in terms of gender, race, or other forms of diversity?
 - (d) **Emotions:** What emotions, if any, would you say accompanied the uptake of this practice - for example, excitement, trepidation, feelings of competition, stress, or other emotions, if any?
 - (e) **Barriers:**
 - a. Are you aware of any tensions or challenges in initiating or maintaining this practice?
 - b. How about tensions or challenges in relation to any other, possibly competing, practices or policies?
 - (f) **Supports:** Aside from those you've already mentioned, were there any other supports or factors involved in the initiation of this practice?
 - (g) **Funding:**
 - a. Do you know how this sustainability practice is funded, if applicable?
 - b. Have there been any resource limitations in carrying it out?
 - c. What would be needed to overcome these limitations?
 - (h) **Temporal:** How long did it take to develop this practice?
 - (i) **Outcomes:**
 - a. How would you describe the influence of this practice overall in your setting?
 - b. Who has been most and least affected or engaged by this practice?

Questions for Domains with 'Cool' Ratings for those 'More Familiar' with Practice

3. Can you now please choose one of the more 'cool' rated domains to discuss as an area with relatively low levels of practice?
 - (a) Can you tell us about your impressions of sustainability practice or lack thereof in this domain?

- (b) What kinds of factors do you think have made the development of sustainability practice challenging in this domain?
- (c) Do you have anything else to add on this topic, or otherwise in relation to practice, before we move on?

Section 2: Sustainability Policies

Introduction to Diagram

Researcher Note: For phone interviews, please go through each domain at a time, beginning with governance, curriculum, research, community outreach, operations, and other to enter their ratings and get any examples.

In this part of the interview, we're going to use the heat diagram to discuss how policy developed in your setting. To start, please rate your setting's activity in relation to sustainability policy across several domains using this diagram.

As a reminder, we are defining "sustainability" as including, at minimum, consideration of the natural environment. When we use the word "policy," we mean official texts produced or used by your [setting] that address sustainability (be it a policy, plan, strategy, or mandate). This may also include documents that guide teaching practice, such as required curriculum.

These are your own ratings based on your experiences and impressions. If you're really not sure, you can simply indicate 'don't know.' Do you have any questions? Would you like clarification on any of the categories?

Questions for those 'Less Familiar' with Policy [replaces questions 4-6]

Box 2. Researcher Note: *If the participant has selected policy as the context with which they are LESS familiar, ask them the following questions. If the participant appears familiar with the policies described and time allows, include regular follow-up probes in relation to the questions below (from 'more familiar' section). Also include questions on 'cool' domain below unless time is short; then move on directly to Section 3: General.*

In your ratings diagram, can you please choose one of the 'hottest' rated domains to discuss in relation to policy?
[Ensure participant or researcher says out loud which domain they choose]

- Can you tell us about your general impressions of policy work in this domain?
- Is there a particular policy or policies that you were thinking of when you decided to give this rating?
- **Origins:** Do you know why your setting decided to create this sustainability policy?
- **Mobility:** Are you aware of any practices or policies elsewhere that influenced its adoption (regionally, nationally, or internationally)?
- **Actors:** Can you tell us about any of the actors involved, champions or others?
- How successful has this policy been, in your estimation?

In your ratings diagram, can you please choose one of the 'cool' rated domains to discuss as an area with relatively low levels of policy?

- Can you tell us about your impressions of policy work or lack thereof in this domain?
- What kinds of factors do you think have made the development of sustainability policy challenging in this domain?
- Anything else to add on this topic, or otherwise in relation to policy, before we move on?

Questions for Domains with 'Hot' Ratings for those 'More Familiar' with Policy

Researcher Note: If the participant has selected policy as the context with which they are MORE familiar, please ask all of the following before moving on to Box 1 for practice.

4. In your ratings diagram, can you please choose one of the hottest rated domains to discuss in relation to good policy?
 - (a) Can you tell us about your general impressions of policy work in this domain?
 - (b) Is there a particular policy or policies you were thinking of when you gave this rating?

5. **Policy Origins:** Can you pick one of these policies to tell us about in some depth and I'll ask you some further questions on it.
 - (a) **Drivers:**
 - a. To your knowledge why did your setting decide to create this policy?
 - b. What influenced its development?
 - (b) **Mobility:**
 - a. Are you aware of any policies or practices elsewhere that influenced its adoption? For example, at another location or in another province or territory?
 - b. What about national or international influences, for example through various networks, associations, or policy bodies?
 - (c) **Actors:** Now I have some questions about any key people involved in developing this sustainability policy in your setting; people either based here or elsewhere:
 - a. Were there any champions or leaders in moving it forward?
 - b. Did anyone from outside your setting influence the development of the policy?
 - c. Were there any resisters to this policy? Or perhaps some that had hesitations? How so?
 - d. Do you know if students played a role in developing the policy? How so?
 - e. What about faculty and staff?
 - f. How would you describe the diversity of those involved, in terms of gender, race, or other forms of diversity?
 - (d) **Emotions:** What emotions, if any, would you say accompanied the uptake of this policy - for example, excitement, trepidation, feelings of competition, stress, or other emotions, if any?
 - (e) **Barriers:**
 - a. Are you aware of any tensions or challenges in initiating or maintaining this practice?
 - b. How about tensions or challenges in relation to any other, possibly competing, practices or policies?
 - (f) **Supports:** Aside from those you've already mentioned, were there any other supports or factors involved in the initiation of this policy?
 - (g) **Funding:**
 - a. Do you know how this sustainability policy is funded, if applicable?
 - b. Have there been any resource limitations in carrying it out?
 - c. What would be needed to overcome these limitations?
 - (h) **Temporal:** How long did it take to develop this policy?
 - (i) **Outcomes:**
 - a. How would you describe the influence of this policy overall in your setting?
 - b. Who has been most and least affected or engaged by this policy?

Questions for Domains with 'Cool' Ratings for those 'More Familiar' with Policy

6. In your ratings diagram, can you please choose one of the 'cool' rated domains to discuss as an area with relatively low levels of policy?
 - (a) Can you tell us about your impressions of policy work or lack thereof in this domain?

- (b) What kinds of factors do you think have made the development of sustainability policy challenging in this domain?
- (c) Anything else to add on this topic, or otherwise in relation to policy, before we move on?

Researcher Note: Return to section 1 (Practice), if participant started with section 2 (Policy)

Section 3: General

Researcher Note: Work to have at least 10 minutes remaining in interview at this point, can skip over cool and/or hot in second policy/practice area if needed to discuss below

Relationship of Policy and Practice

- 7. To your knowledge, are there relationships between the sustainability policies and sustainability practices we have talked about? For example, have the policies been drivers or barriers to practice or vice versa?

Reporting: Sustainability Assessment and Certifications

- 8. Are you aware of any kind of sustainability assessment, evaluation, or certification that takes place in your [setting]?
- 9. Are these assessment or certification details currently communicated? If so, how and to whom?

Section 4: Relations of Local Place to Policy and Practice

- 10. Moving on to some questions about place, do you think physical aspects of place (within this city, province, or another relevant scale) have influenced the approach to sustainability policy or practice in your setting - for example, the land of the setting, the surrounding geography, or buildings or other objects?
- 11. Do you think local culture has influenced the approach to sustainability policy or practice in your setting? How so?
- 12. (a) How would you describe the relationship between sustainability and Indigenous perspectives and priorities in your setting?
(b) Can you provide examples of this relationship?
- 13. (a) What term do you think is most commonly used to refer to sustainability in your setting? [*Researcher note: If examples are needed for clarification, can provide examples of: environment, sustainability, sustainable development, land*]
(b) Do you think the term commonly used is influenced by local context and/or more global influences?

Section 5: Moving Forward - Gaps and New Directions

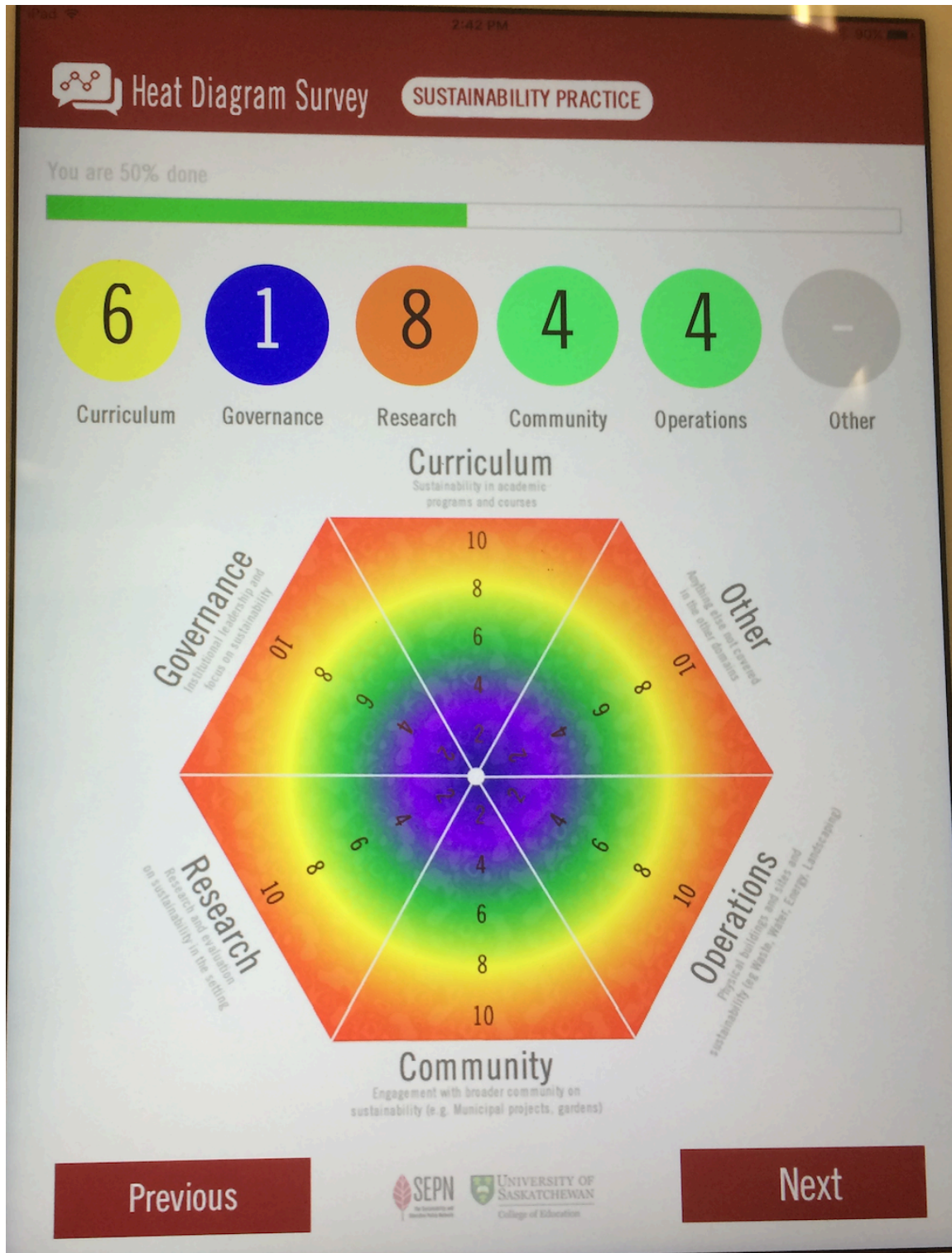
- 14. And finally, some questions about new directions: what more do you think your [setting] should or could be doing to address sustainability practice or policy?
- 15. What resources and support do you think would be needed to address these gaps?
- 16. Is there anything else you would like to add in relation to sustainability policy or practice in your setting?

17. Are there any other key sustainability champions and/or critics of sustainability that we should be talking to as part of our study if possible?
- (a) Do you feel comfortable sharing their names with us?
 - (b) If not, do you feel comfortable sharing our information with them?
18. Are there any documents or policies in particular that you think we should review as part of the study?
- (a) If so, why?
 - (b) Can you provide them or direct us to where they can be found? [*Researcher note: Collect on memory stick at the time if possible*]

19. **ONLY** for student sustainability leader interviews:
To close the interview, can you please tell me why and how you became involved in sustainability efforts in your setting?

Thank you for your time and for participating in this research project!

Appendix B. Heat Diagram Application



Appendix C. Sidewalk Interview Protocol



SITE ANALYSIS SIDEWALK INTERVIEW PROTOCOL

Researcher note:

- *Target: a minimum of 30 per high school for K-12 (elementary and junior high excluded), 50 campus community members for PSE*
- *Identify busy areas, but able to hear each other:*
 - *School lobby/PSE institution student union building (near talking wall?)*
 - *Cafeterias*
 - *Lounges*
 - *Other common areas*
- *Approach passers-by using the introduction and questions below*
- *Use “university” or “school” as appropriate in the introduction and questions below.*

Introduction and questions:

Hi there! We're completing a study on environment and sustainability in schools and universities across Canada. Can I chat with you for a couple of minutes?

[If answer is 'yes':]

I'm going to ask you a few questions about your experiences of sustainability here at your (school/university). All of your comments will remain confidential. Do you have any questions before beginning?

Here is a document/ipad on which I'd like you to answer some questions to start. On the first page you will see some basic information about sustainability, as well as demographic information - if you're able to take a few minutes now and complete that first page that would be great.

[Give them a few minutes to complete first page]

Next, please rate your [settings'] activity in relation to sustainability practice across several domains using this “heat diagram.”

To explain the task, we are defining “sustainability” as including, at minimum, consideration of the natural environment. When we use the word “practice,” we mean any practices or activities in your setting that engage with sustainability (be they led by administration, faculty/teachers, students, community, etc.).

Please rate your [settings'] activity in relation to existing practices that address sustainability across the domains of overall governance, curriculum and teaching, research, community outreach, facilities operations, and 'other' - explanations of these domains are included on the diagram.

Please assign a number from 1-10 for sustainability practices in each of these areas, with '1' indicating little to no sustainability practice in that domain, what we are referring to as 'cool,' and '10' indicating a 'hot' domain of sustainability practice for your setting. Please also add any details of what you have in mind in giving that rating. In other words, types of practice initiatives you may be thinking of in that area.

These are your own ratings based on your experiences and impressions. If you're really not sure, you can simply indicate 'don't know.' Do you have any questions? Would you like clarification on any of the categories?

Final question:

To close our discussion, what more do you think your [setting] should or could be doing to address sustainability (practice or policy)?

Thank you so much for your time. If you're interested in following up with us and/or keeping track of this research, here's some information about the project [provide business card]. Our website is on there so you can check that out. We're also on Facebook and Twitter.

Appendix D. Child Focus Group



CHILD FOCUS GROUP PROTOCOL (GRADES 3-8)

Researcher Note:

- *Students in Grades 3-8 encompass a broad range of developmental capabilities. The language in this guide can be modified according to the age of participants. In the drawing portion below, researchers may want to explain to upper grades (6-8) that drawing is a way of understanding the world around us, that provides different information than words alone (explanation helps articulate that drawing is not necessarily a “childish” activity).*
- *Before the session starts, organize the room as needed – e.g., space for two circles, or two separate rooms for break out groups.*
- *Give out Child Assent and Demographic forms and blank paper to students as they arrive or before starting. All should have file naming code on right corner and group number on left corner (1 or 2).*
- *Before starting, ask instructor not to participate in discussion if that is okay with them. If they prefer to, ask them to identify themselves as the instructor each time they speak.*

Introduction to Research

Before beginning, we would like to acknowledge the traditional First Nations, Métis, and/or Inuit [as appropriate] territories on which we are meeting.

We are researchers from the Sustainability and Education Policy Network, studying environment and sustainability in schools and universities across Canada. As researchers, we learn about the world through collecting information and listening to the stories and experiences of other people. We are visiting 24 schools across the country, including your school. Today we want to talk with you about sustainability at your school as part of this research.

We have handed out a Child Assent form to sign if you are okay with talking with us today as part of this study. Can you please read this now and print your name at the bottom when you are finished. If you don't want to sign, that is fine – please let us know or your teacher know.

In the left corner of your child assent form we've put either a number 1 or number 2. We'd now like the people with '1's' on their form to move to this side of the room, and '2's' to move to this other side of the room. Please move to your side of the room now. Please take your pencil or pen with you.

Researcher Notes:

- *Place recorders in the middle of each group and turn on.*

Demographics Form

The second page of your handout is a Demographics form – questions about what sustainability is and about who you are. We will go through these questions with you now as a group.

For question 1a, we are asking you about how you understand the word “sustainability.” What kinds of words come to your mind when you hear “sustainability”? We are asking you to write down any words or ideas you can think of that might relate to sustainability in the box underneath the question. You can also write “don’t know” or “not sure.”

Does anyone have any questions?

[After students have the chance to write down answers, ask for volunteers to share back what kinds of words or ideas came to mind.]

Next, for question 1b, we are asking you about what kinds of words are used to discuss environmental issues around your school. This could include [as appropriate for grade level]: sustainability, sustainable development, environment, eco, green.

Researcher Note:

- *Depending on time available, ask for student volunteers to share back answers, then continue on to Demographic questions.*
- *The Demographic questions may have to be explained. As such, regularly check for student understanding as you progress through the following questions.*

Drawing and Discussion Activity

Researcher Note:

- *Collect Assent and Demographic forms.*
- *Students should have labelled sheets of blank paper, with a data code label on right corner and a 1 or 2 in left hand corner (latter for appropriate group).*

As we discussed earlier, there are many definitions of sustainability. However, in this research project, we are focusing on different kinds of sustainability knowledge and practice to include considerations of the environment or planet.

For our activity now we would like you to draw a picture of a topic relating to sustainability in your school:

Addressing Topic 1 students: What is your school currently doing to be sustainable?

Now, if this group could please draw pictures, or write information to show how your school is being sustainable, that would be great.

Addressing Topic 2 students: What do you wish your school was doing to be more sustainable?

If this group could please draw pictures, or write information to show what you wish your school was doing to be more sustainable, that would be great.

For ALL students:

- Please only draw/write on 1 side of the paper. If you would like more paper, please let us know
- You have 10 minutes for your drawings. We will let you know when 5 minutes has passed
- The two groups are going to be working at the same time, so please do your very best not to be too noisy
- At the end of the 10 minutes, we will go around each group, at the same time, and ask you to briefly discuss your drawings

Okay, we will now stop drawing and discuss drawings within our group. We will use recorders as “talking sticks” to be passed around the circles for when each student is speaking. When you have the “talking stick,” it will be your turn to speak. If you do not have the “talking stick,” please try and be as quiet as you can. This is because we want the recorders to get all of your information and it could get very noisy in the room if too many people are talking at once.

Great! Are there one or two students who would like to present our discussions back to the whole group.

Researcher Note:

- *Help students choose 1-2 students to present main findings back to the whole group.*
- *Bring groups back together.*

Large Group Discussion

Now that we are all back together, each group will share some of the discussions from their drawings. Each group had a different topic to draw and discuss.

Topic 1 Students:

Can you please tell the whole class some of the things that your school is currently doing to be sustainable, as discussed by individuals in your group?

Topic 2 Students:

Can you please tell the whole class some of the things that you wish your school was doing to be more sustainable, as discussed by individuals in your group?

Final question for the whole group together:

Is there anything important about sustainability that we have not asked you about today that you would like to share?

Thank you for participating in this study!

Appendix E: Focus Group Protocol



SITE ANALYSIS FOCUS GROUP PROTOCOL

Researcher Note:

- *Maintain focus throughout interview on institution for PSE (e.g., sustainability research at institution more broadly vs that of faculty being interviewed, broader than curriculum in one program, etc.). Ministry, SD, and School participants at K-12 more flexible may focus on policies and practices across those levels from their position within any one of the three.*
- *Anytime the term 'setting' is used in the protocol, replace with either 'school' for K-12 student focus groups, 'school, school division/board/district [use appropriate term for that area], and Ministry' for K-12 community focus groups, and 'university' or 'college' as appropriate for PSE focus groups.*

Researcher Instructions for Student Focus Groups:

- *If room and instructor are amenable to changing chair orientation into a circle, set this up before participants arrive*
- *Ask instructor not to participate in discussion if okay with them. If they prefer to, ask them to identify themselves as the instructor each time they speak.*
- *Affix printed heat diagram domains on the walls in various parts of the room*
- *Place one of audio recorders in centre of circle/group and have one researcher hold recorder and be responsible for moving it as a 'mic' to whoever is speaking to avoid inaudible portions for transcription. If only one researcher, ask for a volunteer at start to be the 'mic' person.*
- *Sign researcher signature in consent forms. Labels go on one of the consent forms, and each page of the heat diagram survey - do this in advance of participants' arrival.*
- *Upon arrival greet each participant and hand them **two** consent forms to complete, as well as **one** heat diagram survey, and one heat diagram survey example sheet. Ask them to review consent form, and that we will go over the other forms together. Ask them to take a seat.*

Researcher Instructions for Community Focus Groups (Conversation Cafes) :

- *Set up chair orientation into a circle before participants arrive*
- *Affix printed heat diagram domains on the walls in various parts of the room*
- *Place one of audio recorders in centre of circle/group and have one researcher hold recorder and be responsible for moving it as a 'mic' to whoever is speaking to avoid inaudible portions for transcription. If only one researcher, ask for a volunteer at start to be the 'mic' person.*
- *Upon arrival greet each participant and ask them their role (Eg. City Councillor) and add to labels. Person who does this should be the note-taker for the session, so they can note down roles for their later note taking.*
- *Sign researcher signature in consent forms. Labels go on one of the consent forms, and each page of the heat diagram survey - do this in advance of participants' arrival.*

- Hand participants **two** consent forms, **one** heat diagram survey, and one heat diagram survey example sheet. Ask them to review consent form, and that we will go over the other forms together. Ask them to take a seat.

Introductions

Ask if there are any questions about the consent form. Have participants sign both copies of consent form. Participants retain the non-labelled copy. **COLLECT CONSENT FORMS.**

If you **did not** submit a consent form, please just listen rather than contributing comments.

Turn on both recorders.

For Community FG: ask each participant to briefly introduce themselves (name and role)

Introduction

To open, we would like to acknowledge the traditional First Nations, Métis, and/or Inuit [as appropriate] territories on which we are meeting. *[Researcher note: Most provinces should include a recognition of only First Nations and Métis, and territories should include Inuit and First Nations in some cases]*

We will start this focus group with a survey that will ask you to evaluate your [setting]'s work on environment and sustainability. Please answer to the best of your knowledge, there are no right or wrong answers

Section 1: Sustainability Practices

When you came in you received a form on which we'd like you to fill out some questions to start. On the first page you will see some basic information about sustainability, as well as demographic information, please complete this page first. When everyone has finished, we will explain the next page. If you have any questions, please don't hesitate to ask us. In some questions, we use the word 'Indigenous' - some people may be more familiar with the words "First Nations," "Métis," and Inuit.

Introduction to Heat Diagram

On the next page, please rate your [setting]'s work in environmental and sustainability practice across several domains using this "heat diagram."

To explain the task a bit, we are defining "sustainability" as including, at minimum, consideration of the natural environment. When we use the word "practice," we mean any practices or activities at your setting that engage with sustainability. They can be led by students, teachers, principals, staff, community members, etc.

We'd like you to please rate your [setting's] activity in relation to sustainability practice across the domains of: overall leadership, teaching and curriculum, research, community outreach, facilities operations, and 'other' - explanations of these domains are included on the diagram, but we are going to walk through each of the domains with you now:

- Overall leadership refers to sustainability activities or directives created by your [setting's] leadership, for example your school principal.
- Research refers to information collection and evaluation around environment & sustainability, for example, a school audit or research on your use of energy at the school.
- Community refers to engagement with the broader community, such as working on projects with community members, or having environmental organizations work with the school on environmental projects

- Teaching and curriculum refers to teaching and course content related to environment and sustainability;
- Operations refers to the physical buildings of your [setting], and the operations of the [setting], such as waste diversion (recycling, composting), energy conservation, water conservation, etc.
- Other refers to any other type of sustainability activity that you can think of, which does not fit into the previous domains.

If you get confused on any of the categories during this activity, you can refer to the example sheet, which explains and gives examples for each domain.

We would like you to assign a number from 1-10 for sustainability practices in each of these areas, with '0' indicating little to no sustainability practice in that domain, what we are referring to as 'cool,' and '10' indicating a 'hot' domain of sustainability practice for your [setting]. In the boxes outside of each domain, please also list any details of what you have in mind in giving that rating. In other words, the kinds of environmental and sustainability practices you may be thinking of in that area. These are your own ratings based on your experiences and impressions. If you're not sure, you can simply write 'don't know' across the triangle for that category.

Before beginning, do you have any questions? Would you like clarification on any of the categories?

Researcher Note: Pause for questions and follow-up explanations of the domains as needed. If students do not understand the categories, they will not listen to the follow-up directions on rating, so assessment of their understanding before proceeding is key. Upper-level (Grades 11/12), sustainability-aware classrooms may not need this level of support to proceed; younger students (Grades 9/10) may need additional clarification. Be sure to circulate amongst students while they are completing their diagrams, so that you can follow-up one-on-one with student questions or confusions.

Around the room you'll see that we have put up pieces of paper with each of the domains listed. When you are done, please go to the sign that matches up with your hottest rated domain. For example, if you gave teaching a 10, you would go to that sign. If you have two domains with the same rating, choose one to go to. Please take your heat diagram with you.

Researcher Note: Researchers briefly describe the patterns suggested in the room (e.g., "It seems that X and Y domain tended to have the hottest ratings overall, whereas Z tended to be rated as 'cool.'" Or, "There was a real mix of responses, with no domain clearing coming out more strongly than others)."

1. Why do you think that [name to hottest rated domain(s)] was rated the hottest overall?
2. Does anyone from other groups want to comment on why these didn't choose this domain, which has been rated as the hottest overall?
3. You were also asked to list some practices in each domain on your heat diagram.
 - (a) Can folks call out some of the practices they have written down in the domain where they're standing? *[get a few responses from each group]*
 - (b) Considering your responses and where people are grouped up in the room, what practices did you think were most associated with sustainability at your [setting]? In other words, what kinds of environmental and sustainability practices happen most often at your [setting]?
 - (c) Why do you think these particular practices are the most common?
4. We've talked about which practices you think are most common in your [setting]. Now can anyone share with us their impressions of who has been involved with these practices:

- (a) How are students engaged in sustainability at your [setting]?
- (b) What about teachers and staff?
- (c) How would you describe the diversity of those involved, in terms of gender, race, nationality, etc.?
- (d) Is there any group in this setting that you would describe as excluded from participation or unable to participate for any reason?

Now please go to the sign that matches up with your ‘coolest’ rated domain. For example, if you gave teaching a 1 or 0, you would go to that sign. If you have two domains with the same rating, choose one to go to. Please take your heat diagram with you.

- 5. Why do you think that [name coolest domain of practice] was rated the coolest overall?
- 6. Does anyone from other groups want to comment on why these didn’t choose this domain as ‘cool?’

Assess energy in the room; decide whether to ask participants to take their seats or to remain standing. COLLECT HEAT DIAGRAM FORMS AND EXAMPLE SHEETS.

Section 2: Sustainability Policy [15-20 minutes remaining]

We’re now going to move on to talk specifically about policy. As a reminder, we are defining “sustainability” as including, at minimum, consideration of the natural environment. When we use the word “policy,” we mean official texts produced or used in your [setting]. This may also include documents that guide teaching practice, such as required curriculum.

- 7. Are you aware of any sustainability policies at your [setting]? *[Researcher note: At the K-12 level, also ask about school division policy, and Ministry policy or curriculum, focused on sustainability? Do each of the three levels in turn – school, SD, Ministry.]*

Ask participants to name policies, compile a list of these on the whiteboard or paper roll.

Note: If participants are unaware of policies existing, and/or not familiar with the concept of ‘policy’, skip questions 8-10.

- 8. Do you think policies such as these help support practice around sustainability?
- 9. To your knowledge, are there relationships between the sustainability practices, as indicated in your heat diagrams, and sustainability policies you’ve listed in your [setting]? For example, have the policies driven or been barriers to practice or vice versa?
- 10. Can you think of other policies that are not focused on sustainability that have either helped support, or been barriers to the uptake of sustainability policy and practice in your [setting]? These could be other policies in your setting, or more broadly provincially, nationally, or internationally.

Section 3: Relations of Local Place to Policy and Practice

- 11. Do you think the local place - within this city, province, or other relevant scale, or local culture has influenced the approach to sustainability in your [setting]? If so, how? *(examples: local geography, FN and Métis cultures, newcomer perspectives, municipal policies...)*

12. (a) How would you describe the relationship between sustainability and Indigenous perspectives and priorities in your [setting]? When we use the word 'Indigenous' here, we are talking about "First Nations," "Métis," and "Inuit."
(b) Can you provide examples of this relationship?

Section 4: Moving Forward - Gaps & New Directions

13. To close our discussion, some questions about new directions: what more do you think your [setting] should or could be doing to address sustainability?
14. What resources and support do you think would be needed to address these gaps?
15. Is there anything else you would like to add in relation to sustainability at your [setting]?

Thank you for your participation in this study!

Appendix F: Field Notes Protocol



SITE ANALYSIS

FIELD NOTES PROTOCOL (K-12)

Researcher Name:

Date:

Location:

Key contacts identified during field research:

FILE NAMING CODE OR DATA TYPE	FIELD NOTES
E.g., K12(MB)_I_UAd_01_[JM] Admin office at school 01/22/16, 2-3pm	<i>E.g., Interviewee seemed anxious about the interview, having arrived a few minutes late. They relaxed as we got going. Noticed ...[reflecting a bit on process and impressions during data collection]. Documents mentioned included... Other key contacts</i>
K12(MB)_I_MAd_01_[Phone interview	
K12(MB)_I_MAd_02_[Phone interview	
K12(MB)_SD1_I_Dir_01_[Phone interview	
K12(MB)_SD1_I_SSt_01_[Phone interview	
K12(MB)_SD1_I_Cco_01_[Phone interview	
K12(MB)_SD1_PS School context	
K12(MB)_SD1_PS_I_Te_01_[On-site interview	
K12(MB)_SD1_PS_FG1_[

Appendix G: Photo documentation Protocol



SITE ANALYSIS PHOTO DOCUMENTATION PROTOCOL

Please upload to data storage 2-5 photos in each category (may take more photos and then edit down for final upload, avoid two researchers taking photos in same category to minimize redundancy in photo's foci)

****Take photos of evidence of 'sustainability,' but also of 'unsustainability' in each category.**

Observation Notes: *Remember to make observations about location of photos in your field notes

Ethics: Avoid photos with identifiable faces as we don't have consent for photos

Photo Quality: Please pay attention to photo lighting, creativity, composition ('rule of thirds' - https://en.wikipedia.org/wiki/Rule_of_thirds). Take a variety of larger scale background shots, as well as detailed shots.

Photo Categories: (2-5 photos per category uploaded to data storage)

1-2 top indoor common spaces - school lobby at K-12, student union building at PSE
1-2 top outdoor common spaces - school grounds at K-12, atrium or bowl at PSE (inquire if not sure what a main outdoor common space is)
1-2 major natural spaces (if not already covered, on site or within view; trees on site, etc.)
Transportation (e.g., parking lots, bus loops, bikes, walkways)
Housing (e.g., student residences, neighbouring houses within view)
Food - pictures of main cafeteria, including types of food available, examples of other available food vendors on site or nearby)
Waste (e.g., recycling, compost, examples of lack thereof, facilities re energy, waster, etc.)
Affect/emotion associated with sustainability issues or uptake (e.g., posters with doomsday messaging, motivating messages regarding particular practices, etc.)
Data (e.g., evidence posted in halls or elsewhere of ratings on sustainability assessments or certifications, metrics re energy use or water consumption in buildings, etc. if any)
Other (e.g., environment-related signage for clubs, activities, orientations to environment; other)

Appendix H: Document Collection Protocol



SITE ANALYSIS DOCUMENT COLLECTION PROTOCOL

K-12 Document Search Process

Template for collection of documents: <https://drive.google.com/drive/u/0/folders/0BztaSs2OXqgyWVdTTzi0M2NWdEk>

For all new documents collected, please include file name as per naming system in “Data Code” column in “T2 SA K-12 Document Collection” spreadsheet.

Ministry Level Search

1. Theme 1 Documents are indicated in the spreadsheet “T2 SA K-12 Document Collection.”

Check dates/availability of Ministry Strategic Plans, and availability of Sustainability Documents across five domain areas (Governance, Teaching & Curriculum, Facilities & Operations, Research, and Community Engagement). Any documents that are out of date have been highlighted.

2. Search for any sustainability documents that are out-of date, or were not available at the time of Theme 1 data collected (see instructions below). When new documents are found, save copy on Google drive folder “T2 SA K-12 Document Collection” and update spreadsheet “T2 SA K-12 Document Collection” on Google sheets.
 - a. Search through Environmental/Sustainability section of Ministry website (linked in spreadsheet for BC, MB, ON, and QC). Collect any additional sustainability documents that were not collected for/postdate Theme 1 Site Analysis.
 - b. For Ministries without dedicated Environmental/Sustainability website sections (NB, NU), browse Ministry website for sustainability-related documents.Note: Any sustainability documents mentioned during a Ministry interview should be collected and added to the spreadsheet.

3. Search for any general Ministry documents (e.g. Strategic Plans, Budgets) that are out-of date, or were not available at the time of Theme 1 data collection. If applicable, save copy on Google drive folder “T2 SA K-12 Document Collection” and complete spreadsheet on Google sheets.

School Division (SD) Level Search

1. Review “T2 SA K-12 Document Collection” to determine if sustainability policies/plans were collected for a given SD during Theme 1 Census (2014). All previously collected sustainability policies and plans have been collected and stored on Google drive folder “T2 SA K-12 Document Collection.”
2. If a SD sustainability policy and/or plan was not available at time of census, search for these documents. When new documents are found, save a copy on Google drive folder T2 SA K-12 Document Collection and complete spreadsheet T2 SA K-12 Document Collection on Google sheets.

- a. Search “SD Name” + (environmental policy or sustainability policy or green policy); and “SD” + (environmental plan or sustainability plan or green plan).
- b. Browse “policy” or “documents” section of SD website. Alternatively, browse “environmental/environmental education,” “sustainability,” or “education for sustainable development” sections of SD website.

Note: Any sustainability documents mentioned during a SD interview should be collected and added to the spreadsheet.

3. Collect SD strategic plan. When new documents are found, save a copy on Google drive folder T2 SA K-12 Document Collection and complete spreadsheet T2 SA K-12 Document Collection on Google sheets.
 - a. Search “SD Name” + Strategic Plan.
 - b. If first search does not yield results, browse Governance/Administration section of School Division website.

Appendix I: Student Consent Forms



FOCUS GROUP ASSENT FORM

PARTNER ORGANIZATIONS

Association for the Advancement of
Sustainability in Higher Education
Canadian Centre for Policy Alternatives
David Suzuki Foundation
Learning for a Sustainable Future
Sierra Youth Coalition

CONTRIBUTING ORGANIZATIONS

Assembly of First Nations
Canadian Federation of Students
Global Youth Education Network
Métis National Council
Sustainability Solutions Group

Your class is participating in a research project on sustainability education in Canada. I am going to spend a few minutes telling you about our project, and then I am going to ask you if you are interested in taking part in the project. Your parents have been informed about your participation and they are also welcome to ask us any questions about this research.

Who are we?

We are researchers at the University of Saskatchewan. We work in the College of Education.

Why are we meeting with you?

We want to tell you about a study that involves students like yourself. We want to see if you would like to be in this study too.

Why are we doing this study?

We want to find out what schools are doing to help the environment, how and why they are doing it, and what makes it easy or hard for a school to become more sustainable.

What will happen to you if you are in the study?

If you decide to take part in this study there are some different things we will ask you to do. First, we will ask what sustainability means to you. Second, we will ask you to describe what you think sustainability means to your school. Third, we will ask you about what your school could do to work on sustainability. Some of our activities today will involve [drawing/filling out a diagram].

While doing these things all you have to do is try your best. If you have tried your best and do not know what to say or do next, you can guess or say 'I do not know'.

It will take about 60 minutes to do these things as a group.

Are there good things and bad things about the study?

What we find in this study will be used to help make our schools more environmentally sustainable. As far as we know, there will be no harmful effects of our study on you.

28 Campus Drive
College of Education
University of Saskatchewan
Saskatoon, SK, Canada
S7N 0X1
(306)966.2319

www.sepn.ca



Please Turn Over! 

Will you have to answer all questions and do everything you are asked to do?

If we ask any questions you do not want to answer then tell us you do not want to answer. If we ask you to do things you do not want to do then tell us that you do not want to do them.

Who will know that you are in the study?

The things you say and any information we write about you will not have your name with it, so no one will know they are your answers or things you did.

The researchers will not let anyone other than themselves see your answers or any other information about you. Your teachers, principal, and parents will never see the answers you gave or the information we wrote about you.

Do you have to be in the study?

You do not have to be in the study. No one will get angry or upset with you if you don't want to do this. Just tell us if you don't want to be in the study. And remember, if you decide to be in the study but later you change your mind, then you can tell us you do not want to be in the study anymore.

Do you have any questions?

You can ask questions at any time. You can ask now or you can ask later. You can talk to me or you can talk to someone else at any time during the study. Here are the telephone numbers to reach us.

Nicola Chopin, Sustainability and Education Policy Network, 306-966-2319

This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office ethics.office@usask.ca (306) 966-2975. Out of town participants may call toll free (888) 966-2975.

IF YOU WANT TO BE IN THE STUDY, SIGN YOUR NAME ON THE LINE BELOW:

Child's name, printed: _____

Date: _____

Researcher Signature: _____

Date: _____



Appendix J: Adult Consent Forms



PARTNER ORGANIZATIONS
Association for the Advancement of
Sustainability in Higher Education
Canadian Centre for Policy Alternatives
David Suzuki Foundation
Learning for a Sustainable Future
Sierra Youth Coalition

CONTRIBUTING ORGANIZATIONS
Assembly of First Nations
Canadian Federation of Students
Global Youth Education Network
Métis National Council
Sustainability Solutions Group

28 Campus Drive
College of Education
University of Saskatchewan
Saskatoon, SK, Canada
S7N 0X1
(306)966.2319

www.sepn.ca



INTERVIEW CONSENT FORM

The Sustainability and Education Policy Network (SEPN) is a network of researchers and organizations advancing sustainability in education policy and practice across Canada. Based at the University of Saskatchewan, SEPN is the first large-scale, national-level research collaboration to collect and analyze comparable data at all levels of education.

This study asks about the degree to which a sustainability focus is included in practices and policies in your work or study setting and about the drivers and barriers to sustainability uptake.

By participating in this study, you will help us identify how education policy and practice can better support the transition to more environmentally sustainable societies.

Project Title: Sustainability and Education Policy Network: Leading Through Multi-Sector Learning, funded by Social Sciences and Humanities Research Council

Researcher: Dr. Marcia McKenzie, Principal Investigator, Department of Educational Foundations; Director, Sustainability Education Research Institute, University of Saskatchewan, 306-966-2319, marcia.mckenzie@usask.ca

Procedure:

- This study will explore your experiences of sustainability in your setting
- We will start by asking you some general questions about sustainability and then we will ask you about sustainability policies and initiatives happening in your setting. You will be asked to rate your institution's sustainability initiatives
- This interview should take approximately 1 hour
- We will be audio-recording and creating transcripts from the recordings

Potential Risks:

- There are no anticipated risks to you by participating in this research

Benefits:

- Interested participants will be provided with a summary of the survey's results
- There are several possible benefits to participating in this study including contributing to the research on sustainability policy and practice in Canadian schools; connecting your school, school division, ministry, or institution with a national network that is on the cutting edge of school sustainability; and showcasing and celebrating your school's sustainability successes while highlighting areas for improvement

Please Turn Over 

Confidentiality:

- Your identity and responses will be kept confidential
- You will be assigned a pseudonym by the researchers, which will be used for any quotations we use from you when reporting results. We will keep a list of participants and their pseudonyms that will only be accessible to the researchers
- Consent forms will be stored separately from data collected to ensure there will be no way to identify individual participants. Any identifying information you put on paper today will be removed when we enter it into our database
- Whether you choose to participate or not will have no effect on your position (e.g., employment, class standing, access to services) or how you will be treated

Right to Withdraw:

- Your participation is voluntary. You can choose to answer only those questions that you are comfortable with or knowledgeable about
- You may withdraw from the research project for any reason without explanation or penalty of any sort. Your right to withdraw will apply until we have disseminated the research results. If you wish to withdraw from the study, you may contact Nicola Chopin, Project Manager, at (306) 966-2319 or nicola.chopin@usask.ca

Storage of Data:

- The results of this study will remain confidential. The data will be entered into a database and stored until 2023 at which point it will be destroyed

Questions or Concerns:

- If you have questions during this process, please ask the researchers
- If you have questions afterwards, please contact Nicola Chopin, Project Manager, at (306) 966-2319 or nicola.chopin@usask.ca
- This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office ethics.office@usask.ca, (306) 966-2975, or toll free (888) 966-2975

Signed Consent

My signature below indicates that I have read and understand the description provided; I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project. A copy of this Consent Form has been given to me for my records

Name of Participant

Signature

Date

Yes, I would like to receive the results of this study

Yes, I would like to receive updates on other SEPN research

If yes to either, please provide your email address: _____

Researcher's Signature

Date



www.sepn.ca

Appendix K: Research Brief



ENVIRONMENTAL AND SUSTAINABILITY EDUCATION POLICY RESEARCH IN K-12: A REVIEW OF THE LITERATURE

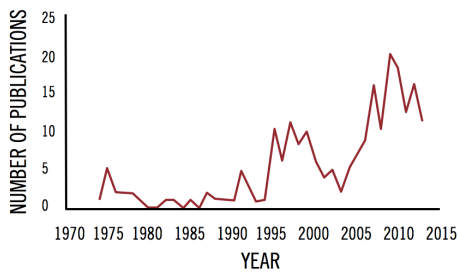
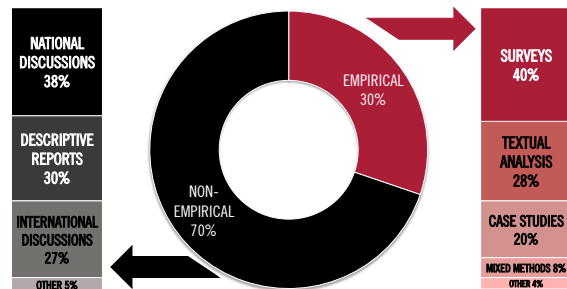
This research brief summarizes a review conducted by the Sustainability and Education Policy Network (SEPN), which described the scope of policy research in sustainability education in the Kindergarten-Grade 12 system. SEPN's review describes sustainability education policy research conducted to date in detail and provides a platform for broadening policy studies in sustainability education. Recommendations for addressing gaps in the research literature are also provided.

For full results see: Aikens, K., McKenzie, M., & Vaughter, P. (2016). Environmental and Sustainability Education Policy Research: A Systematic Review of Methodological and Thematic Trends. *Environmental Education Research*, 22(3), 333-359. <http://dx.doi.org/10.1080/13504622.2015.1135418>.

To cite this research brief: Aikens, K., McKenzie, M., Vaughter, P., & Chopin, N.S. (2017). Environmental and Sustainability Education Policy Research in K-12: A Review of the Literature. Sustainability and Education Policy Network, University of Saskatchewan, Saskatoon, Canada.

Systematic Review: By The Numbers

- 215 peer-reviewed, English language research articles
- Published from 1974-2013
- 71 different countries
- Articles focused on K-12 education policy studies, self-defined as sustainability- or environment-related
- 150 (or 70%) non-empirical articles and 65 empirical articles
- Survey data was the focus of the majority of empirical articles, though textual analysis, case study, and mixed methods studies were also identified
- Most non-empirical articles focused on national-level discussions and most reports discussed national policy developments



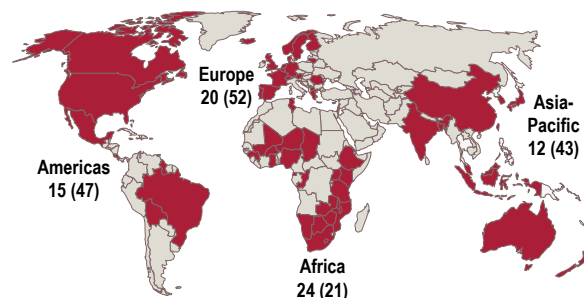
Temporal Trends Across Four Decades of Policy Research

Three distinct 'spikes' emerged in policy research output:

- Mid-1970s: the field of environmental education emerges
- Late-1990s: the 1992 United Nations Conference on Environment and Development
- Mid-2000s: the United Nations Decade of Education for Sustainable Development

Geographic Trends

- The most frequently researched countries were the United States, United Kingdom, Australia, and China/Hong Kong; these countries were the focus of over half of all publications in the review.
- Fewer studies were from Africa, South and Central America, Eastern Europe, and most of North and West Asia.



Emergent Themes

SEPN analysed the publications through an inductive, iterative thematic coding process. The review identified four main themes:

Policy Drivers: Sustainability imperatives such as environmental or socio-cultural degradation, environmental disasters, and climate change were identified in the literature as **key drivers** of policy development. While uptake of a climate change focus in education policy research was found to be slow, climate change recently emerged as an increasing driver for sustainability education policy, with 50% of all reviewed articles published since 2010 referring to climate change as a driver of policy. A **desire to align with international policy** imperatives such as the Tbilisi and Rio Declarations also acted as an impetus for sustainability education policy development according to the articles reviewed. Further, **international organizations**, such as United Nations affiliates and the World Bank, were cited as spurring sustainability uptake in education policy.

Competing Paradigms: SEPN's review found a research focus on variations and **tensions in the terminology and understandings of sustainability** mobilized in education policy. Several authors noted that the openness to interpretation of Education for Sustainable Development (ESD) may result in ESD prioritizing economies and failing to challenge business as usual. The review also identified research discussing the tensions between conceptions of environment and nature, with some authors noting contradictory themes of human domination of nature and the promotion of harmonious interrelationships with nature.

Teaching and Learning Directives: Empirical articles in the review **overwhelmingly focused on curriculum, teaching, and pedagogy** in relation to policy. Many of the articles reviewed focused on state-level policies designed to infuse sustainability into curriculum as interdisciplinary competencies. However, the findings were generally **pessimistic on the success of cross-curricular integration** of sustainability. Conceptions of pedagogy, or how sustainability ought to be taught, emerged as a focus in the 1990s. The literature often described **sustainability as being in tension with other policy priorities**, such as a focus on testing and performance, as well as pressure to compete internationally via student achievement.

Marginalizations: Some research focused on which perspectives and knowledge are centered or marginalized in policy, and by what mechanisms. Grounds for marginalization discussed in the literature included a focus on **cultural tensions**; North-South divisions; and the **privileging of policy makers and researchers over practitioners and cultural groups** in decision-making, international meetings, and in the development of state-level policies and resources. Several authors noted sustainability education can contribute to **colonization**, prioritizing western concepts over more holistic, situated, traditional forms of education.

Key Research Gaps and Directions for Moving Forward

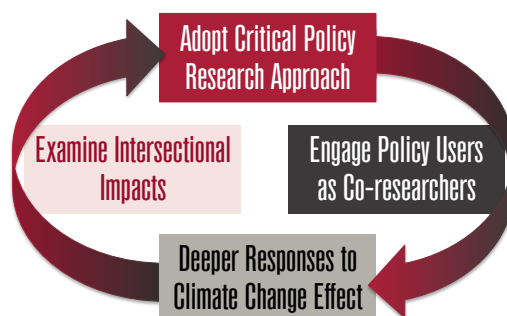
SEPN's review identified several gaps and reinforced calls for future empirical research to engage more with sustainability education policy.

Critical Policy Theory and Methodology: A general inattention to broader developments in critical policy research remains apparent in the field. While the research reviewed initially focused primarily on surveys, more recent research has included case studies and multiple-methods. The empirical research reviewed typically focused on textual analysis or policy enactment and neglected the systematic examination of policy development and interactions within various aspects of the policy process. SEPN's review proposed the **adoption of a critical policy research approach**, which understands policy processes as complex, with multiple actors influencing the identification, championing, and resisting of problems and solutions.

Engaging Research Users: Research that effectively influences policy often **involves policymakers and practitioners** from the outset. SEPN's review identified a need for greater consideration within the literature to how policy research can inform policy. Critical policy research in the field could engage more with research fields that are more oriented toward policy development and solutions with generative political action; this would entail a **shift from university-driven projects to projects that include policy "users" as co-researchers**, providing opportunities for mutual learning and multi-directional knowledge flows among co-researchers.

Intersectionality: Analyses of interactions between categories of marginalization in relation to policy (e.g., environment, race, gender, class, other forms of oppression) were largely absent from the reviewed articles. SEPN proposes **re-imagining policy research**, for example, incorporating intersectional, Indigenous, and materialist methodologies; adopting land- and place-based frameworks; and extending conceptualizations of the policy cycle to include considerations of political strategy and outcomes.

Climate Change: Sustainability education policy research is only just beginning to respond to climate change. Education systems will need to **develop policies that address climate change** adaptation and the emotional implications of loss of place for students and communities. The challenges of climate change will require education policy research to become more engaged, political, practical, and imaginative.



PARTNER ORGANIZATIONS

Association for the Advancement of Sustainability in Higher Education
Canadian Centre for Policy Alternatives
David Suzuki Foundation
Learning for a Sustainable Future
Sierra Youth Coalition

CONTRIBUTING ORGANIZATIONS

Assembly of First Nations
Canadian Federation of Students
Global Youth Education Network
Métis National Council
Sustainability Solutions Group

28 Campus Drive
College of Education
University of Saskatchewan
Saskatoon, SK Canada, S7N 0X1
www.sepn.ca



Social Sciences and Humanities
Research Council of Canada

Conseil de recherches en
sciences humaines du Canada

Canada