

Ecopedagogy, The Earth Charter, and Manitoba Curriculum, A Critical Content Analysis

by

William Burton

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfilment of the requirements of the degree of

MASTER OF EDUCATION

Department of Curriculum, Teaching and Learning

University of Manitoba

Winnipeg

Copyright © 2019 by William Burton

Table of Contents

Acknowledgments	5
Dedication	6
List of Figures	7
List of Tables	8
Chapter 1: Introduction	9
Historical Literary Context	10
Duality	11
Global Crisis	13
Climate change.	13
Ecological devastation.	17
Enclosure of the Commons	18
Provincial Crisis	21
Responses by Manitoba Education	25
Purpose of Study	28
Research Problem	30
Importance of Study	31
Unpacking Terminology	33
Education for sustainable development.	33
Education for sustainable living.	35
Environmental education.	36
Ecoliteracy.	37
Educational Perspectives on the Environment	38
Issues with current practices.	38
New approaches to teaching.	40
Critical pedagogy.	42
The hidden curriculum.	45
The null curriculum.	46
Critical pedagogy and curriculum.	47
Ecopedagogy.	48
The Brundtland Report	54
The Earth Charter (2000b)	56
Discussion of the Earth Charter (2000b).	58
Overview of Studies	60
Studies on the implementation of education for environment.	61

Studies on attitudes and behaviours in education for environment.	67
Babiuk and Falkenberg study (2010).	72
Gaps in Literature	76
Chapter 3: Methodology	79
Content Analysis	80
Description.	80
Incorporation of ‘critical’ component.	82
Steps.	84
Manifest content analysis.	85
Latent content analysis.	87
Validity	89
Document Selection	90
Case Study Example	98
Assumptions Underlying the Study	100
Limitations	101
The Researcher	104
Chapter 4: Results	107
Summary and Analysis of Code Occurrence	108
Summary and Analysis of Code Occurrence by Curriculum Document	110
English language arts.	110
Technology education.	113
Physical / health education.	114
Science.	115
Social studies.	118
Summary and Analysis of Code Occurrence by Grade	120
Grade 9.	120
Grade 10.	122
Grade 11.	124
Grade 12.	126
Summary and Analysis of Code Occurrence by Code	128
Summary and Analysis of Code Occurrence by Compulsory Versus Non-Compulsory Courses	131
Summary and Analysis of Code Occurrence by Earth Charter Principle	133
Emergent Themes	141
Chapter 5: Recommendations	151
Recommendations from Data Analysis	152

Recommendation 1: When undertaking curriculum reform, the Government of Manitoba should create space for a discussion of and application of spirituality within the Manitoba curriculum documents.	152
Recommendation 2: Schools should look to increase their capacity for offering Technology Education courses or skills across grade levels.	156
Recommendation 3: The Government of Manitoba should seek to reform the Grade 9 and 10 Social Studies and Grade 9 Science curriculum.	159
Further Recommendations	162
Recommendation 4: Schools should look to move away from subject-specific blocks of the school day and begin to integrate courses.	162
Recommendation 5: When undertaking curriculum reform, the Government of Manitoba should increase the expectation that students undertake an action component in demonstrating their understanding of content.	166
Recommendation 6: The Government of Manitoba should move towards making Grade 12 Global Issues a compulsory course for graduation.	169
Recommendation 7: When undertaking curriculum reform, the Government of Manitoba should create space for teachers to support authentic real-world application of learning through a project-based approach.	170
Recommendation 8: When undertaking curriculum reform, the Government of Manitoba should reduce the content of curriculum documents and provide space for teachers to make professional decisions.	173
Recommendation 9: When undertaking curriculum reform or development, the Government of Manitoba should use the Earth Charter (2000b) as a guiding document.	176
Conclusion	177
Appendix A: The Earth Charter (2000b)	181
Appendix B: Content Analysis Data Chart	188
References	189

Acknowledgments

A debt of gratitude for the knowledge, support and insight that Gary Babiuk and Thomas Falkenberg have provided to me since the early years of my Bachelor of Education are due. To both of you, thank you for your tireless hard work for the cause of education for sustainability, your questioning of the status quo and pushing for a rethinking of education in Manitoba. Both of you have been a wonderful inspiration for the possibilities open to teachers in this province for using their positions to teach and spread the importance of ecological literacy.

Thank you also to Heather Anderson. Though we are just becoming acquainted, that despite you having just concluded your long journey through your doctorate, you were willing to step up when offered the opportunity for joining my committee. Without doubt this thesis is all the better for your knowledge.

An acknowledgement to Seven Oaks School Division, a home away from home since 2016. The relationship that you have developed with the community, support and encouragement for new initiatives, programming and approaches to classroom instruction, have made for a vibrant and dynamic work environment. I am proud to work for you.

Finally, a huge thank you to Matt Henderson. You took a chance on me by bringing me on board as a founding faculty member of Maples Met School. The conversations around pedagogy, professional development, ecological literacy have made me better teacher and person than had we not met. Whether you realize it or not, you have been an incredible mentor and role model for your tireless and innovative work. I hope that I can continue to work with and learn from you in the years ahead.

Dedication

Without doubt, this thesis would not have reached its conclusion without the love, support and encouragement of my partner, Michelle. Through the weekend mornings at coffee shops, evenings and late nights hunched over my laptop, never once did you question the worth of this endeavour. This work is dedicated to you, Julian and Felix - Dad is trying to do what he can to make the world a little bit of a better place for you to grow up in.

List of Figures

Figure 1 Prairie Climate Centre Atlas	23
Figure 2 Prairie Climate Centre Atlas	23
Figure 3 Education for Sustainable Development Venn Diagram	33
Figure 4 Total Code Occurrence in all Manitoba Curriculum Documents	108
Figure 5 Code Occurrence in Manitoba Curriculum Documents	110
Figure 6 Average Code Occurrence per Curriculum Document Page	111
Figure 7 Grade 9 Code Occurrence by Course	120
Figure 8 Grade 10 Code Occurrence by course	122
Figure 9 Grade 11 Code Occurrence by course	124
Figure 10 Grade 12 Code Occurrence by course	126
Figure 11 Total Code Occurrence in all Manitoba Curriculum Documents	128
Figure 12 Code Occurrence in Compulsory Senior Years Courses	131
Figure 13 Code Occurrence in 16 + 2 Earth Charter Principles	133
Figure 14 Emphasis of Earth Charter Principles in Manitoba Curriculum Documents	136
Figure 15 Total Code Occurrence in Manitoba Curriculum Documents per Earth Charter Section	137
Figure 16 Essential Elements to be Integrated into the Manitoba Curricula	141

List of Tables

Table 1 The Principles of Ecopedagogy	49
Table 2 The Earth Charter (2000b)	57
Table 3 Codes and Code Synonyms for Content Analysis	84
Table 4 Courses Excluded from Content Analysis and Rationale for Exclusion	91
Table 5 Courses Included from Content Analysis and Rationale for Inclusion	95
Table 6 Earth Charter Section, Earth Charter Principle and Code Occurrence	138

Chapter 1: Introduction

“Whether you succeed is not even the right question; what matters is that you try to do the right thing. Whether big or small, the act in itself counts”

(Berry in Goleman et. al., 2012, p.134)

This thesis will argue for the necessity of reconceptualising education in Manitoba to align itself with an increase in knowledge, attitudes and actions towards living sustainably on Planet Earth¹. The changes advocated are a response to the widening disconnect between humankind and the natural world and the continued devastation of the planet that sustains us. While predicting what society will look like in future years is challenging, at present what appears more than likely is that our current way of life will be drastically altered by climate change. A response is imperative and beyond due.

In Chapter One I will start with an outline of how the industrialized world has impacted the planet in an international, Canadian and Manitoban sense before making links to how Manitoba Education has responded to date. In Chapter Two I will unpack a variety of terminology pertaining to education for the environment, before focusing on ecopedagogy as a philosophical approach to education and the Earth Charter (2000b) as a pedagogical tool for implementing a more critical and effective approach to developing attitudes, knowledge and actions for positive environmental approaches to living. In Chapter Three I will introduce the

¹ While the Province of Manitoba also refers to ‘skills’ as a key component of learning, I consider that having a skill is the same as having knowledge. From here on out, whenever ‘knowledge’ in terms of ‘knowledge, attitudes and actions’ is used, skills will be implied as part of this term.

methodological approach my research will take, employing a critical document analysis to investigate and contrast the compulsory Manitoba Senior Years curriculum to the Earth Charter (2000b). In Chapter Four I will share the conclusions of my research, before discussing the implications and recommendations for further study in Chapter Five.

Historical Literary Context

Before moving into further discussion of this topic, I want to begin by situating these ideas in a literary context. In Annie Proulx's 2016 novel *Barkskins*, she details the family history of two families dating back to the 17th century. The first family, the Sel's, are Mi'kmaq from the Northwest Coast of Turtle Island, and the second family, the Duquet's, later known as the Dukes, are settlers of French descent in modern day Quebec. The book traces both families' relationship to the continent's vast woodland. The Duquet's seek to survive in the new hostile environment by wielding control over the woodland. Later as this control becomes stronger with the harnessing of technology, the Duquet's move to harvesting the woodland to build their fortune, chopping, slicing and selling the trees. Conversely, Proulx writes, the Sel family have lived off the land for generations, using the woodland for hunting and pulling select plant species for medicinal purposes. As the forest is culled, the Sel's begin to lose the balance they have with nature. As European domination of the ecosystem increases, it forces the Sel's to leave their traditional way of life and join the Europeans as they deplete the forest (Proulx, 2016).

Barkskins offers us a story often repeated with variations around the world. Colonialism and the dominance of white, western European capitalism might well have laid the seeds for the comforts many of us enjoy today, but it has come at an incredible cost to our planet. I do not

doubt that you know this, yet here we are participating to some extent in the cyclical and growing devastation of Planet Earth. Yet there is hope. *Barkskins* ends on positive note; in Proulx's final chapter she writes of the Sel and Duquet families uniting in a joint effort to replant the forests that their ancestors destroyed.

Duality

As in this novel, the emerging duality between humankind and the planet can be traced back to the writings of Rene Descartes in the seventeenth century. Descartes viewed the mind and matter as separate entities. Humans, he believed, were separate from the rest of the natural world because they possessed a soul, were self-reflective, able to think rationally and contemplate the results of their actions. The rest of nature, including animals were machine like and reactionary, and therefore Descartes maintained, *homo sapiens* should not concern themselves with how we treat other species such as plants and non-human animals (Pepper, 1996). While Descartes does not directly call for human domination over nature, Bai considers his philosophy the one to which we can draw a line connecting today's binary view of human/nature (Bai, 2015). Undoubtedly today we have a duality between humankind and the natural world; whereas once humans lived in a symbiotic relationship with their natural environment, today we harness our planet for our own needs and desires (Howell & Passmore, 2013).

Margaret Atwood has explored the connection between humankind and nature in Canadian literature through *Survival: A Thematic Guide to Canadian Literature* (2012). In a colonial context, Atwood suggested that survival in Canada pitted nature against humans: the

former, with its rugged, unforgiving and temperately extreme character, versus the latter - a determined, yet naive European settler. We can see this played out in *Barkskins*. Of Canadian identity, she states that “We need such a map desperately...we need to know about here, because here is where we live. For members of a country or a culture, shared knowledge of their place, their here, is not a luxury but a necessity. Without that knowledge we will not survive” (Atwood, 1972, p. 19). Despite its apocalyptic theme, Chambers (1999) reads Atwood’s observation of the Canadian character as “closer to the truth than we might want to imagine” (Chambers, 1999, p. 140). Proximity and a reciprocal relationship with nature have the ability to imbue an understanding and respect of the natural world. You can find environmental connections in many other fictional texts, of note Ernest Callenbach’s *Ecotopia* (1981), in which citizens must work the forest and be involved in planting and conservation, before being permitted to use the trees (Callenbach, 1981). This policy is informed by indigenous practices of aiming to “live lightly on the land” (p.32).

As threaded throughout the plot of *Barkskins*, settlers on this tract of North American land became more and more successful in ‘surviving’ by asserting dominance over the land. Today families no longer need to stock up food for the winter months, when they can visit a grocery store in December for fresh strawberries; likewise, accurate reading of animal behaviour and cloud patterns has been replaced by a weather app on our phone; generations ago yearly migration was undertaken for finding a food source, and today people may migrate for a better job or standard of living. As our needed proximity to the knowledge for sustaining our body has widened, scientific research has made clear that this has and continues to result in reduced ecological knowledge of our natural environment (Berry, 2007), less respect for the natural

environment (Naess in Newman and Payne, 2005), as well as physical and mental damage to our minds and bodies (Louv, 2008). Yet, “there is evidence that a connection between people and nature, beyond the need for food, is inherently necessary...” writes Noddings (2003), “...human beings have a genetically based need to affiliate with nature” (Noddings, 2003, p. 124).

Global Crisis

Climate change.

Placing genetic dispositions or physical needs aside, humankind has not treated our planet with necessary care. There are multiple crises we are currently facing, but let me begin by focusing on one: climate. It is April 2017. The year 2014 was the hottest since records began to be taken back in 1880, until it was overtaken by 2015, and then 2016. Of the 17 hottest years on record, 16 have been since 2000. Climate scientist at Pennsylvania State University, Michael E. Mann, states that if humans were *not* responsible for the increasing temperatures, there would only be a 1 in 1 000 000 chance of these temperatures occurring. “We can expect records to continue to be broken as global warming proceeds,” Dr. Mann said earlier this year (Gillis, 2017, n.p). A rise in temperatures in the last year resulted in smog closing 1800 schools in India (Suhasini & Barry, 2016) and the cancelling of over 150 flights in China (Times of India, 2017). Both India and China together hold the dubious record of over half the 4.2 million yearly deaths from air pollution every year (Thomson Reuters, 2017), but climate change does not restrict itself to human constructed national boundaries.

One such example is that in the first ten years of this century, forest fires in the United States caused an average of \$665 million in property damage each year. This has resulted from:

higher spring and summer temperatures and earlier spring snowmelt that typically cause soils to be drier for longer, increasing the likelihood of drought and a longer wildfire season, particularly in the western United States. These hot, dry conditions also increase the likelihood that once wildfires are started by lightning strikes or human error, they will be more intense and long-burning. (Union of Concerned Scientists, n.p.)

Despite the deeply sceptical views currently held by the Trump Administration towards the role that humans have played in climate change, a report released in November 2017 that brought together thirteen U.S. federal agencies stated that it was “extremely likely – meaning with 95 to 100% certainty – that global warming [was] man (sic) made, mostly from carbon dioxide through the burning of coal, oil and natural gas” (Associated Press, 2017). The Report represented “the most comprehensive summary of climate science since 2013, showing a warming, worsening world” (Associated Press, 2017).

What have we seen of changes in climate here in Canada? A variety of weather events in the last five years have caused chaos. In 2013, Calgary’s downtown core was flooded out by excessive rains that fell on the Eastern side of the Rocky Mountains causing \$5 billion worth of damage (Sutherland, 2016). This was the costliest natural disaster in Alberta history until 2016 when large parts of Fort McMurray were ravaged by wildfires, forcing 80 000 from their homes and the destruction of 2 600 dwellings. Professor of Wildland Fire at the University of Alberta, Mike Flannigan expressed that “this will happen again” (Cotter, 2017). A year of severe weather in 2016 that cost \$4.9 billion in insurance claims continued as predicted into 2017 with flooding hit Ontario and Quebec, wildfires burning in British Columbia and three heat waves in the Arctic (Kohut, 2017).

One of the most important developments in recent human history was the discovery of how oil can be harnessed as an incredible source of energy. Mabro (2006) states that it is a well-established fact that oil played a,

critical role in transforming the economies of today's industrialized countries during the last century... [powering] the engines of economic growth, hastened technological innovations, expanded production possibilities and increased productivity (Mabro, 2006, p.xi).

It is beyond the scope of this paper to provide an exhaustive list of every product containing oil, but a few examples include: nylon, shampoo, lifejackets, paint, tires, and ammonia along with more obvious examples such as automobile gasoline, jet fuel and motor oil (Conoco-Phillips, n.d.). Its combustion powers our factories, fuelling the planes, trains, boats and trucks that deliver consumer items to our stores. But more than this, it powers technological change and innovation and political stability (Heinberg, 2010, p.8). Anderson claims that of the energy that flows from nature into human society about 75% comes from oil, coal and gas (Anderson, 2007, p.82). If the oil supply were to run dry tomorrow, almost every nation on earth would grind to a halt. Economic growth, Gross National Product and the ease to which many around the world have become accustomed to live is a result of the remarkable versatility and energy found in this liquid. Yet as we know, the extraction of this energy requires its combustion and consequently release of carbon into the atmosphere. As many activists have claimed, amongst them Naomi Klein, David Suzuki and Bill McKibben, the best thing that Canada can do is leave the 173 billion barrels of oil that the Alberta Tar Sands holds exactly where it is. Despite promises and

ratification of the Paris Climate Agreement in 2015, governments have been slow to make the necessary transition to a post oil economy (Goodwin, 2017).

Richard Heinberg, a Senior Fellow of the Post Carbon Institute and recognized as one of the foremost authorities on Peak Oil, has written multiple books arguing that we have passed the period of peak oil. We are in the midst of a “moment in time when the world will achieve its maximum possible rate of oil extraction; from then on, for reasons having mostly to do with geology, the amount of petroleum available to society on a daily basis will begin to dwindle” (Heinberg, 2010, p.1). Environmentalist and author Bill McKibben bluntly states that continuing on our current trajectory will require using up remaining fossil fuel reserves, pushing the planet beyond safe levels of carbon (McKibben, n.d.). We are at a crossroads: we are running out of oil, but it remains a product we currently rely on to sustain our current lifestyle. We will run out of oil and need to move to a post-oil economy, but whether we do this before fossil fuels run out and the planet becomes uninhabitable for human and many forms of animal and plant life is dependent on moving to a post-oil economy. This is, as Heinberg (2007) argues “our central survival task for the decades ahead... and to do this as peacefully, equitably and intelligently as possible” (Heinberg, 2007, p.19).

Solutions have been proposed, Johann Rockström and Ottmar Edenhofer argued in an October 2018 editorial that government can play a crucial role in reducing oil consumption by mandating a €30 per tonne tax on CO² emissions (Edenhofer and Rockström, 2018). Following the 2016 Paris Climate Agreement, Canada took the lead on developing a national policy to tax carbon consumption starting at \$10 per tonne, and rising to \$50. Yet, at the time of writing, the

Provincial Governments across the country are lining up to resist, while offering no alternative solution to rising domestic emissions.

How might the question of problematic oil consumption be recognized everyday in our schools? To what extent do children recognize the current role of fossil fuels in their lives? And consequently, in what ways are we making them aware of the aforementioned, and providing them opportunities for living without oil today, so that they are better prepared for a post-oil world tomorrow?

Ecological devastation.

Our second planetary crisis is ecological devastation. Whereas climate change can be attributed directly to the release of carbon into the atmosphere, ecological devastation takes on multiple forms. We can see it in polluting of soils and water, consumption of non-renewable natural resources, as well as plant and animal species extinction. While sometimes going hand in hand with climate change, the common denominator for environmental degradation is humans, which is a species increasing in number at an exponential rate. In 2005, the Millennium Assessment, a report involving more than 1300 experts worldwide was released. It indicated that in the last 50 years, humans had degraded the earth's ecosystem more rapidly than at any comparable time in history (Millennium Ecosystem Assessment, 2005). Between 1960 and 2000 the world's population doubled, while the global economy increased six-fold (United Nations, 1999). As Heinberg (2010) summarizes "there are too many of us using too much too fast, while competing for dwindling resources" (Heinberg, 2010, p.155).

Johann Rockström (2010) of the Stockholm Resilience Centre speaks of the challenges we face from climate change in terms of 'planetary boundaries'. Rockström states that there is

mounting evidence that we are “crossing hard-wired thresholds at the planetary level, threatening the self-regulating capacity of the planet to remain in the stable and favourable state in which human civilizations and societies have developed during the past 10,000 years” (Rockström, 2010, p.72). With his colleagues, Rockström outlines nine critical Earth System processes, including climate change, depletion of stratospheric ozone, land use change, freshwater use, rate of biological diversity loss, ocean acidification, amounts of nitrogen and phosphorus inputs to the biosphere and oceans, air pollution from aerosol loading and chemical pollution (Rockström, 2010). These systems are not closed loops, but work with and support each other, meaning that if one system exceeds its capacity and fails, then it no longer holds the ability to support other systems. If we are able to stay within the capacity limits of these nine systems, then humankind can buy time to reduce the burden on them (Rockström, 2010).

In 2015, a report from the group studying the planetary boundaries found that the biogeochemical, land-system and climate change boundaries were either in the zone of uncertainty (increasing risk), or beyond zone of uncertainty (high risk) of surpassing the capacity of the system (Steffen et. al., 2015, p.6). In summer 2018, an updated report that took into consideration the Paris Climate Agreement of 2016, stated that based on latest data, temperatures would need to be kept below the 2 degree threshold to ensure a ‘hothouse trajectory’ was not set in play due to cascading Earth System collapses (Watts, 2018).

Enclosure of the Commons

How did we get here? The line that connects present day with Rene Descartes in the 17th century also passes through the enclosure movement of the 18th century that first swept across

England and later the rest of Europe. As part of the agricultural revolution, the enclosure movement saw public fields formerly shared by local farmers ‘closed off’ and privatized for exclusive use. Historian Matthew Kelly believes the elimination of the commons has direct connections to the early history of urbanization in England (which then spread to North America). He states that it was a “really crucial development in terms of British relationship to the land and to some extent the fairly widespread disassociation with it” (BBC: Arts and Ideas, 2017). Indeed ‘Commons Thinking’ is a term that mirrors the pre-enclosure movement.

Kendrick (2009 in Stibbe, Ed.) writes that ‘The Commons’ is,

life-sustaining or life-enhancing resources and services that have not been divided up and assigned a monetary value in the global economy but instead are shared. They range from the air we breathe, pollination provided by bees, land that provides dwelling and food for gathering, cultivating and sharing rather than selling, to allotments, libraries, public parks, pavements and on to childcare care for the elderly and words of comfort given freely and willingly rather than at an hourly rate (p.51).

The physical separation of the population taking care of the land as a collective, to individual ownership of a small tract of land that could be purchased, exploited and then sold at will changed the psychological connection and therefore relationship with the environment. The unravelling of the Commons approach accompanied the reductionist writings of Descartes and led to the physical and mental separation of collective responsibility to the planet for the well-being of all. Descartes contribution was the idea that because man [sic] could think and doubt his thoughts, possessed ‘secondary qualities’ (Pepper, 1996). This separated humans from nature, a *Cartesian dualism*, as nature was “reducible to atoms, whose unthinking, machine-like

behaviour was universally the same and explicable in terms of mathematical laws” (p.141-142).

A hierarchy of thought cleared the way for actions that treated the natural environment as subject to humanities whims (p.142). Naomi Klein (2014) links the destruction of the Commons to the built in behavior of the Western economic system to squeeze out profit and ‘capitalize’ on opportunity for profit; capitalism she claims “left to its own devices, is capable of nothing else” (p.9). After all, despite the assumptions of many around the world, capitalism is not natural, it was created by humans, and can be altered or replaced if we wanted to.

Environmentalists have lamented this expanding gulf between populations and the natural environment. Goleman et. al. (2012) points out that as the majority of the world’s population now lives in urban areas, it is even easier to ignore the myriad of ways that the planet sustains us, because today, “our use of resources and the ensuing ecological impacts are dispersed across the entire planet - often seeming invisible or too far away for us to fully recognize” (Goleman et. al., 2012, p.5). The temporal and perceived distance between humans and that which is consumed means “most of us do not truly grasp how our everyday actions - our engagement in the systems of energy, agriculture, industry, commerce, and transportation on which we rely - can threaten the health and well-being of the earth” (p.4). Citing Ornstein and Ehrlich (1989), Heinberg (2010) claims the human brain is hardwired for fight or flight responses immediate danger, but are innately unable to effectively respond to slowly developing problems that are not personalized (Heinberg, 2010, p.128). At present our Earthly existence is analogous to the frog in the saucepan - if the frog was dropped in with the water already boiling, it would jump out, but the frog will boil alive in the pot if the temperature gradually rises.

Provincial Crisis

To the smug Manitoban in January of any year, the idea of ‘global warming’ might lead to a witticism of ‘bring it on!’ And while it may be true that a warmer climate may bring economic opportunities (Sauchyn, Kulshreshtha and Diaz, 2010, p.354), digging deeper uncovers more serious repercussions on the Manitoba environment than warmer winters. Whereas the current benefits of a cold winter include recreation, northern transportation over frozen ground, fewer pests, an abundant and reliable source of water from melting snow (p.356), researcher David Schindler writing in 2010 argues that,

positive effects of the warming will be few, and disadvantages many. Agriculture will be much diminished, with the advantages of a warmer and longer growing season more than offset by a lack of water. Prairie forest boundaries will be pushed far to the north, largely the result of increased fires, some following extensive insect outbreaks. Precipitation events will be fewer, but more intense. Transportation by water, and tourism and recreation on water resources, will be almost non-existent (Schindler in Sauchyn, Diaz and Kulshreshtha, 2010, p.x).

Indeed we are beginning to see these changes play out in Manitoba.

In 2017 a melting permafrost and flooding in Northern Manitoba led to damage to the rail line connecting Southern Manitoba and the remote community of Churchill, Manitoba (MacLean, 2017). As various levels of government and the track owner Omnitrax squabbled over who footed the bill to repair the line, residents of Churchill faced increased costs associated with flying goods such as food, fuel and vehicles instead of taking the railway (CBC News,

2017a). Events escalated to the extent that Winnipeg Harvest sent food supplies to the community, before the rail line was finally repaired in 2018. On this most recent disruption caused by warming, Manitoba Climate researcher Danny Blair argues that what was considered normal weather events and ground stability are things that we can no longer rely on (CBC News, 2017b).

University of Manitoba Climate Researcher David Barber explained the record setting Manitoban hot summer and cold fall in 2018 with simultaneous record hot temperatures on the Canadian coasts was linked to melting sea ice. He added that “the probability is that we're going to get hotter hot spells, and colder cold spells, wetter wet spells and dryer dry spells because we're changing the probability distribution of those types of climate systems," (Petz, 2018).

Sauchyn (2010) details that as the prairie region is Canada's most variable in terms of climate, global warming will amplify the likelihood of a departure from 'normal weather' (Sauchyn, Diaz and Kulshreshtha, 2010) to a “larger range of extreme events”, with the prospect of “severe and or prolonged drought,” presenting the most risky scenario (p.38). The changing climate, mixing with changing human interaction will have major impacts on the ecosystem in the prairie provinces. Henderson and Thorpe (In Sauchyn, Kulshreshtha and Diaz, 2010) outline consequences such as an increase in forest fires, increased stress on aquatic ecosystems, loss of wetland and associated decline in waterfowl population. The speed of this change is accelerating (Henderson and Thorpe In Sauchyn, Kulshreshtha and Diaz, 2010) and will be most pronounced along the margins of coniferous forests (Sauchyn, Kulshreshtha and Diaz, 2010), such as the Canadian Shield immediately to the East and North of Winnipeg. Kulshreshtha and Diaz consider the prairies as one of the most vulnerable regions to the impact of climate change, with

particular negative impacts on quality of life for Indigenous peoples and recent immigrants (Sauchyn, Diaz and Kulshreshtha, 2010, p.27). A relatively high number of small rural communities, lower median income levels, and a reliance on agriculture and forestry in Manitoba will make this province more susceptible than others in Western Canada (Davidson in Sauchyn, Kulshreshtha and Diaz, 2010, p.183). But it would be foolish to think that Manitoba could isolate itself from the more severe impacts of climate change around the world. Climate Change Connection's Curt Hull suggested that "When the rest of the world is in turmoil because of tornadoes, hurricanes, floods, droughts, and mass migrations because of climate, the economic consequences are really quite severe. That's what we're likely to feel in Manitoba" (Petz, 2018).

In 2018 the Prairie Climate Centre released an online tool to support the education of Canadians on the impact climate change will have on the Province of Manitoba. Through this tool, users are able to find their community, see how various scenarios based on carbon emissions will impact climate, and hear from people in communities on the impact of these changes. Figure 1. highlights temperature increases in Canada based on a 'high carbon scenario' with red areas representing high levels of change in climate, blue areas representing low levels of change in climate. Figure 2 shows a closer view of Manitoba, which particularly the southern region shows high levels of change in climate, with the detail bar on the right showing that the average number of days with +30 c temperatures rising from 11 per year between 1976-2005 to 47.1 days between 2051 and 2080. Clearly, Manitoba will be significantly impacted based on these projections.

Figure 1

Prairie Climate Centre Atlas (Prairie Climate Atlas, 2018)

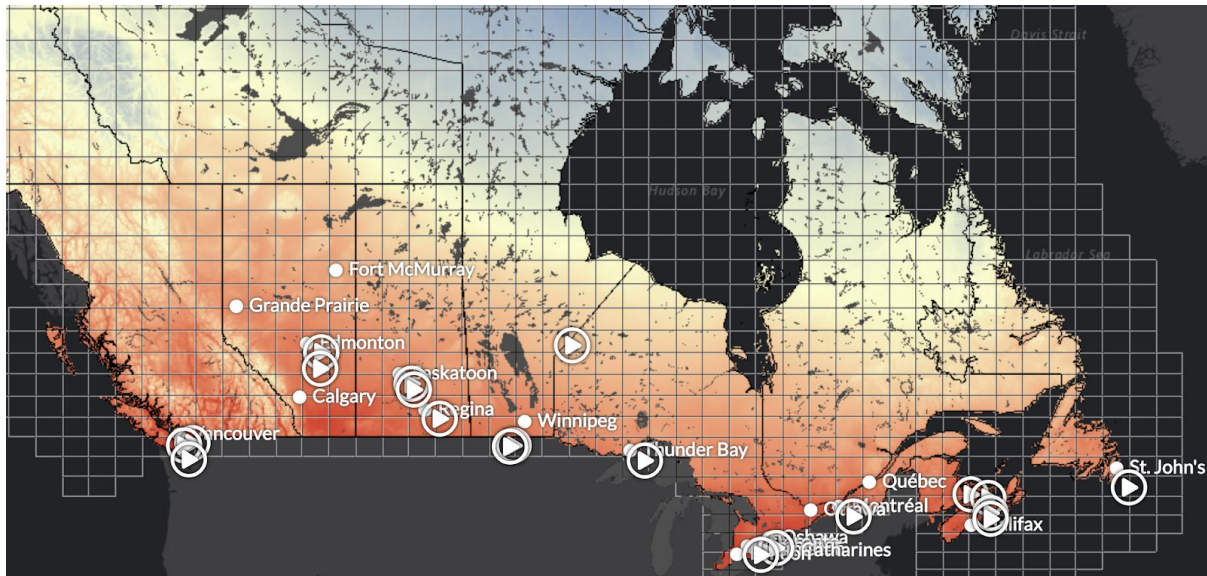
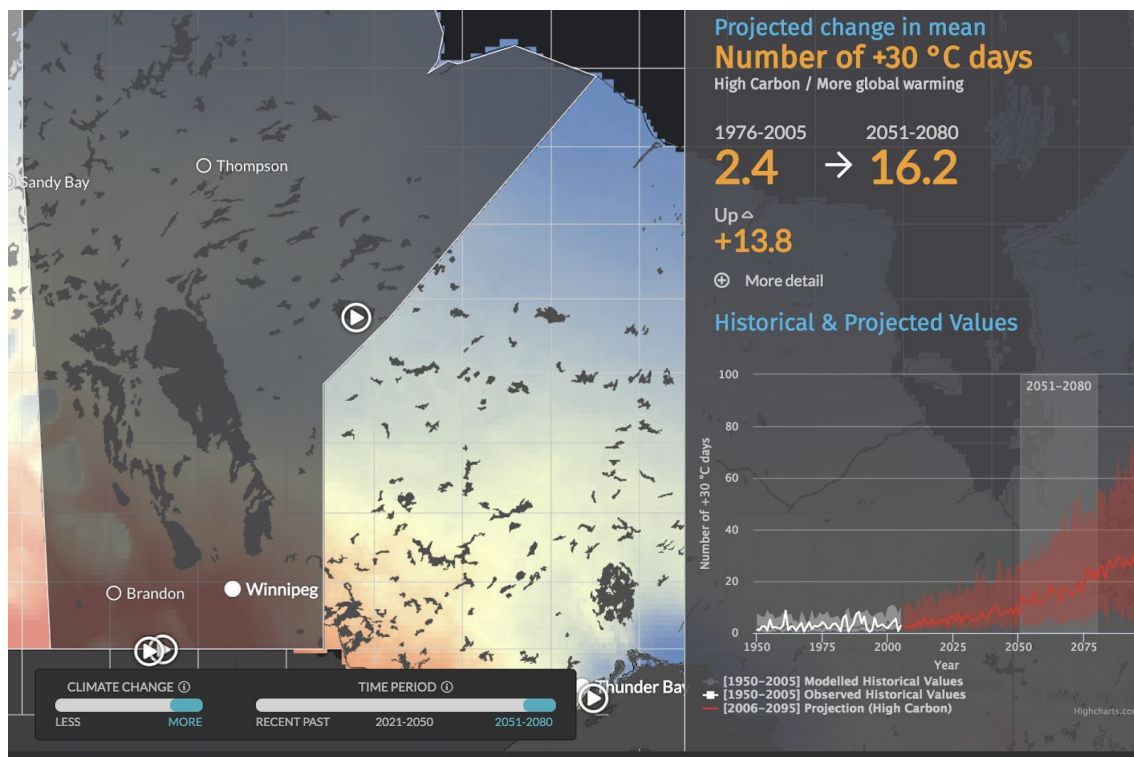


Figure 2

Prairie Climate Centre Atlas (Prairie Climate Atlas, 2018)



Yet as with our current economic systems, we continue to educate in our classrooms on a ‘business as usual’ mindset. Based on the aforementioned evidence I would argue that this is tantamount to a practice of negligence, as we are completely ignoring the needs of those most vulnerable to the impacts of climate change.

This sentiment is further enforced by Blair Feltmate, Associate Professor in the School of Environment, Enterprise and Development at the University of Waterloo. In Summer 2017 he was appointed by the Canadian Government to Chair an expert panel on preparing Canadians for the challenges of climate change. When interviewed by CBC’s Aaron Wherry he argued that at present Canadian’s are not well prepared for a changing climate, but that with each new disaster more and more citizens and politicians are getting behind allocating resources to preparation, yet is concerned that we are not evolving quick enough. “We do not have the luxury of time,” he states, “we’ve got to get on with adaptation.” Feltmate outlined that for Canadians to become prepared it will require two steps: reducing emissions, and preparing communities and individuals to deal with the unavoidable consequences of climate change (Wherry, 2017). I would argue that education can play a pivotal role in both of these steps.

Responses by Manitoba Education

In the early 2000s Manitoba began making changes to reflect the need for an increased environmental focus in its curriculum. In 2004 Manitoba Education announced its intention to make Education for Sustainable Development (ESD) one of its top priorities for Kindergarten to Grade 12. This involved: appointing an ESD consultant for the province, leading the Council for Ministers of Education in supporting the spread of ESD around the country, and initiating an

ESD council for leaders in environmental education in the province, complete with a four year action plan (2013-2016). In 2009, Manitoba became the first Canadian province to include the term sustainability in its mandate, becoming one of six main pillars of focus for learning. Manitoba also connected with various environmental organizations across the country including Learning For Sustainable Futures, Free the Children, International Institute for Sustainable Development, Fort Whyte Alive, and partnering with Manitoba Hydro to offer grants for sustainable development initiatives. The Province began connecting with postsecondary faculties of education to encourage the incorporation of environmental principles into pre-service teacher training. The Manitoba Department of Education revamped the Education for Sustainability website to act as a support for educators wanting to know more about concepts and resources that could support their teaching of ESD in the classroom. Finally, connections were made with SEdA (Sustainability and Education Academy), who worked with school administrators, leading eventually to the mandate of all schools needing a sustainability component in their school action plan by 2015 (Government of Manitoba, n.d. a). These were significant developments that placed Manitoba at the fore of Education for Sustainable Development in a global sense.

But what of the curriculum? The Grade 12 World Issues course was revamped to focus on ‘citizenship and sustainability’ where,

students conduct inquiry into the social, political, environmental, and economic impact of contemporary and emerging global issues. Through their inquiry, students focus on questions of quality of life locally, nationally and globally. This course is based on the principles of active democratic citizenship, ecological literacy, critical media literacy, and

ethical decision-making, and consolidates learning across the disciplines to empower students as agents of change for a sustainable and equitable future. As a mandatory component of the course, students plan and implement a community-based action-research project. (Government of Manitoba, n.d. b).

Course themes included media, consumerism, environment, gender, human rights, poverty, wealth and power. Explicit reference in supporting documents for teachers is a breakdown of ‘ecological literacy’ and how to effectively incorporate it into the learning environment.

However, despite the value this course offers in meeting our ecological imperative, given our current needs this course by itself is insufficient for the following reasons: firstly, Global Issues 40S is only offered as a single course in Grade 12; secondly, it is not a compulsory course, meaning that students are able to graduate without being exposed to its content; thirdly, though at present it represents the flagship of ESD in the Manitoba curriculum options it stands alone in placing environmental education as central to learning, thus leaving only tenuous connections to other K-12 curriculum. Further adding to concern is that as reported by Seven Oaks School Division, only 45 students were enrolled in the course for the 2017/18 school year (Personal Correspondence, March 15 2018), which represents 4.2% of grade 12 students eligible to enrol. While broad conclusions cannot be drawn from the sample of Seven Oaks School Division, it does represent a concern.

I would argue that while the topics considered in the Grade 12 Global Issues course offer an excellent introduction to education for the environment, these issues need to be incorporated into all subject areas for it to truly permeate student attitude, knowledge and action. Seeking to

uncover the extent environmental content is present in other Senior Years curriculum will be the aim of this study. A further explanation of this is where I will now turn.

Purpose of Study

Given the current relationship that humankind has with the planet, the current trends in society, and the view that education can play a role in encouraging youth to reconnect with nature and prepare for a warming planet, the purpose of this study is to uncover whether the Manitoba Senior Years curricula are meeting our need as a province to develop positive attitudes, knowledge and actions in youth towards the planet. These three elements are purposefully chosen. Knowledge of the climate crisis - that it is real, that it will impact humans, that we will see ramifications in Manitoba - activates an emotional response. But that emotional response might be ignored, or rejected unless students translate that knowledge into an attitude that they should care. If students develop the knowledge about climate change, accompanying it with the desire or attitude to do something about it, then they need to be encouraged and supported through opportunities in the school to take action, to develop agency and a recognition that they can do something about the issue. Each of knowledge, attitude and action is essential to inform each of the other elements - one or two out of three is insufficient.

The central argument is this: the environmental crisis is the central crisis of our time and failure to address this will lead to large sections of planet earth, including Manitoba, being unable to sustain human life. We are in the throes of what Elizabeth Kolbert calls 'the Sixth Extinction' (Kolbert, 2014), which will lead to plant and species loss not seen in millions of years. At present, the environmental movement is failing to meet the aforementioned needs.

Shellenberger and Nordhaus (2009) wrote critically on the failures of the ecological activism in *The Death of Environmentalism*, outlining that they have “become convinced that modern environmentalism, with all of its unexamined assumptions, outdated concepts, and exhausted strategies, must die so that something new can live” (p.10). To what extent is this evidenced in the Manitoba curriculum documents?

Humanity needs to reverse the human impacts on the planet and transition to a post-oil economy and warming planet, and educators need to keep sounding the alarm to make the invisible visible (Goleman et.al., 2010, p.34). Marcuse (in Kahn, 2010) advocated,

working within the capitalist framework in order to stop the physical pollution practiced by the system if they were undertaken with a revolutionary thrust toward a more sustainable, peaceful, and free planet and doing so along with ‘the Great Refusal’ - methodological disengagement from and refusal of the establishment, aiming at a radical transvaluation of values... rejecting death-principle culture and imagining an alternative reality principle based on reconciliatory life instincts capable of integrating humanity with its animal nature (Kahn, 2010, p.133-134)

The United Nations has repeatedly identified education, specifically public education, as humankind's best opportunity to raise a generation of ecoliterate students capable of taking on these challenges. While I have detailed the rapid changes that the Province of Manitoba undertook in an effort to raise the profile of ESD and incorporate it more into the Manitoban classroom, I feel that more needs to be done. Because curriculum is developed and published by the Provincial Government in Manitoba and sets the agenda of learning in the Manitoba classroom, it is essential that multiple rather than specialist curriculum address these concerns.

Research Problem

This study will research whether the compulsory Manitoba Senior Years curriculum meet the criteria set by The Earth Charter (2000b). At present, Senior Years students need to earn 30 credits between Grade 9 and 12 to graduate in the English program. Of those 30 credits, 17 are compulsory courses from English Language Arts, Mathematics, Physical/Health Education, Science and Social Studies. I will employ the Earth Charter (2000b) as a measure to gauge the extent that Manitoba curriculum documents promote the ideals of creating a “just, sustainable and peaceful society” (United Nations, 2000a). The methodology of critical content analysis will be used to comb through compulsory Manitoba curriculum, with outcomes to identify the following:

- Which codes appeared frequently within the curriculum documents?
- What does the presence of codes within the curriculum documents say about the values and goals of the curriculum documents?
- Do any patterns emerge from the results?
- Which codes were not present within the curriculum documents?
- What does the absence of codes within the curriculum documents say about the values and goals of the curriculum documents?
- Were any codes used to contradict their use in the Earth Charter (2000b)? If so, how?
- Were any codes used *vaguely*? Could their vague use allow an educator to repurpose them to align with the Earth Charter (2000b)

- What changes to curriculum documents should be advocated to align more closely with the Earth Charter (2000b)?
- What marginalized voices are included in the Manitoba curriculum? What marginalized voices are excluded?
- Does the Manitoba curriculum promote or challenge a continuation of the status quo in terms of attitudes, knowledge and behaviours for education for environment?
- Overall, to what extent does the Manitoba Senior Years curriculum support, ignore or contradict the need to cultivate attitudes, knowledge and actions to support environmentalism in Manitoban youth?

Importance of Study

Two clear problems emerge that underline the importance of this study. Firstly, we are facing an ecological crisis, which is human-led, the impacts from which Manitoba will not be immune. Secondly, past inquiries into student knowledge and behaviours as a result of the Manitoba curriculum (such as Babiuk & Falkenberg (2010), Belton (2013), Hart (2002), Eckton (2016), Jacques (2012), Kraljevic (2011), Metz et. al. (2010), and Michalos et. al., (2015)) are not meeting our imperative to wrestle with these concerns (more on these later). My study will conclude with an analysis of research findings, suggestions for modifications to the compulsory Senior Year curricula and prompt avenues for further research.

Chapter 2: Literature Review

The Industrial Revolution opened up new ways to convert energy and to produce goods, largely liberating humankind from its dependence on the surrounding ecosystem. Humans cut down forests, drained swamps, dammed rivers, flooded plains, laid down tens of thousands of kilometers of railroad tracks, and built skyscraping metropolises. As the world was moulded to fit the needs of Homo sapiens, habitats were destroyed and species went extinct. Our once green and blue planet is becoming a concrete and plastic shopping centre.

Yuval Noah Harari, *Sapiens*, p.350.

Chapter One served as an introduction to our planetary crisis. It presented the dualism that has emerged between humans and the planet as well as the connection that this represents to education in the Province of Manitoba. The chapter ended with a summary of the research problem I will seek to address. Chapter Two is an opportunity to survey the literature of previous studies, and as evidence to support my research problem. It will be divided into five sections: Part 1 will unpack the multitude of terms that pertain to education for environment; Part 2 will outline academics' views on the value of education for environment and what needs to be done; Part 3 will explore critical theory and its environmental branch – ecopedagogy, which will inform my research; Part 4 will connect educational perspectives, ecopedagogy and the United Nations, specifically the Earth Charter (2000b) document; and, Part 5 will survey previous studies on education for environment with a focus on the Manitoban context and detail the gap that this study aims to fill.

Unpacking Terminology

Education for sustainable development.

In recent years, academics in the field of education have increased their focus on areas such as wellness, indigenous perspectives and education for sustainable development. The latter, *Education for Sustainable Development* (or ESD) is the most commonly used term, and currently preferred by Manitoba Education in their published documents, resources and operational language. For example the Government of Manitoba has a website dedicated to Education for Sustainable Development featuring dozens of resources on education for environment (See <http://www.edu.gov.mb.ca/k12/esd/> for more details).

Lester Brown, founder of the Worldwatch Institute, introduced the concept of sustainability in the early 1980s and defined a sustainable society as one that is able to satisfy its needs without diminishing the chances of future generations. Several years later, *Our Common Future* (1987), the report of the World Commission on Environment and Development (more commonly referred to as the ‘Brundtland Report’), used the same definition to present the notion of sustainable development.

Sustainable development has three components: (a) environment; (b) health and well-being; and (c) economy. If you consider the three to be overlapping circles of the same size, the area of overlap in the center is human quality of life, as seen in Figure 3. As the environment, society, and economy become more aligned, the area of overlap increases, and so does human quality of life. (McKeown, 2013, p. 11).

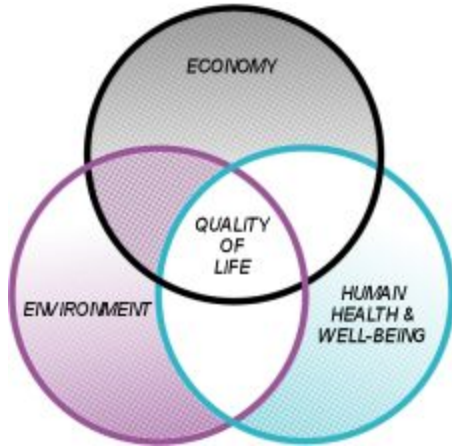


Figure 3

Education for Sustainable Development Venn Diagram (Government of Manitoba, n.d. c.)

Despite being useful in outlining how there are connections between these facets of society, concerns emerge from employing this visual as an approach to teaching on environmental principles. For example, does the economy not reside wholly within the environment? In a capitalist society, does the economy not play a determining role in human ability to have a good quality of life? What determines quality of life, and do its metrics represent all peoples?

University of Manitoba professors Babiuk and Falkenberg conducted a large study of ESD in Manitoba (2011). They consider the phrase *sustainable development* as problematic in the context of the state of affairs in developed countries. This is because “the connotation of the phrase links it for us to the kind of economic and social development that we see as being in conflict with core principles of living sustainably” (Babiuk & Falkenberg, 2011, p. 4). Other thinkers are more damning of ESD. British scientist and author of *The Revenge of Gaia* (2007) James Lovelock wonders whether Dr. Brundtland, founder of the term ‘sustainable development’

ever imagined that her words would be manipulated and “so grievously misunderstood” (Lovelock, 2007, p.100). An active environmentalist in his earlier years, Lovelock recently called the term sustainable development “meaningless drivel” (Hickman, 2012) that allows politicians to establish their green credentials without making any meaningful policy changes for the planet (Lovelock, 2007, p.100). Richard Kahn questions whether sustainable development might just be a reincarnation of what Ivan Illich referred to as the ‘global classroom’ - an opportunity to turn ‘ecocrisis’ into a rallying venture for money, manpower and management (Kahn, 2010, p.14). Porritt (In Pepper, 1996) is less generous, suggesting that employing the definition of sustainable development “allows politicians and economists to prattle on about ‘sustainable growth’ even though current patterns of economic growth and genuine sustainability and wholly contradictory statements” (Porritt in Pepper, 1996, p.74). Therefore, for my study Education for Sustainable Development (ESD) will only be used when referring to Government of Manitoba documents. While considerations on human well-being and the environment should be incorporated into education for the environment, owing to its political appropriation and failure to facilitate a necessary critique of capitalism, I believe that education for sustainable development offers too weak a term for use.

Education for sustainable living.

Another useful definition that can help inform my research is *Education for Sustainable Living* (ESL). At the Centre for Ecoliteracy founded by Fritjof Capra and David Orr, their definition of sustainability goes deeper than simply meeting material needs, surviving, or trying to keep a degraded planet from getting worse. For them, a truly sustainable community is alive when it is,

fresh, vital, evolving, diverse, dynamic. It supports the health and quality of life of present and future generations while living within the limits of its social and natural systems. It recognizes the need for justice, and for physical, emotional, intellectual, cultural, and spiritual sustenance (Stone, 2010).

Juxtaposed to Education for Sustainable Development, the priority for Education for Sustainable Living lies not on the welfare of the economy, but on human well-being. However, as a term, ESL situates humans at the centre of thinking environmentally, failing to locate humans as one piece of a complex and interconnected system. I contend that this only perpetuates the human/nature dualism that was discussed earlier, and therefore I do not see it as an entirely viable term for this study.

Environmental education.

A commonly used, but often misunderstood term is *Environmental Education* (EE). William Stapp (1969) provided a definition of stating that it is “aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to solve these problems, and motivated to work towards their solution” (Stapp, 1969, p.34). Four elements comprise this definition: (1) a clear understanding that man (*sic*) is an inseparable part of a system, consisting of man (*sic*), culture, and the biophysical environment, and that man (*sic*) has the ability to alter the interrelationships of this system; (2) broad understanding of the biophysical environment, both natural and man-made (*sic*), and its role in contemporary society; (3) fundamental understanding of the biophysical environmental problems confronting man (*sic*), how these problems can be solved, and the responsibility of citizens and government to work toward their solution; (4) attitudes of concern for the quality of

the biophysical environment which will motivate citizens to participate in biophysical environmental problem solving (Stapp, 1969, p.34-35).

As a term *environmental education* remains problematic in its current form, as it suggests that environment is a subsection of education in general, such as arts education, indigenous education or peace education for example. However, in Manitoba environmental education remains a subsection of learning in the school and does not permeate all subjects.

Ecoliteracy.

A term coined by Orr (1992), *ecoliteracy* defines the ecologically literate person as one who possesses knowledge of the interrelatedness of humans, human society and the natural environment. The ecoliterate citizen sees and understands the world in ‘systems’, which is awareness of the “carrying capacity, overshoot, Liebig’s Law of the minimum, thermodynamics, trophic levels, energetics, and succession” and informs their knowledge (Orr, 1992, p.92). To have ecoliteracy is to have a strong knowledge of the ways in which people and societies have had a destructive impact on the planet. But it is also accompanied by a resolve that instead of participating in the norms of a world that does not think and act with systems thinking as paramount, that this ‘ecoliterate’ knowledge leads humans to become stewards of the planet. It is understood that a failure to do so will harm human health, well-being and flourishing. Without doubt, ecoliteracy offers a valuable perspective. Yet in my view ecoliteracy as a term is incomplete as it lacks critical analysis. Ecoliteracy makes no reference to the underlying cause of environmental degradation, namely our current dominant economic system.

In sum, Education for Sustainable Development, Education for Sustainable Living, Environmental Education, and Ecoliteracy all provide operative definitions that can support the

understanding and framing of conversations and practice in education. I do not however see any of these terms as strong enough to employ as a pedagogical tool in classrooms or operative lens for this research study. Later in this chapter I will explore ‘ecopedagogy’, a term that draws in many of the valuable components of these definitions, but importantly includes a critical element informed by critical theory. Throughout the remainder of this study I will use the neutral term ‘education for environment’ to refer broadly to any definitions, teaching or learning that connects to environmentalism within education, that may or may not encompass ideas contained within these discussed definitions.

Educational Perspectives on the Environment

Issues with current practices.

The renowned ecologist Arne Naess called for “a more ecocentric ethic... embracing plants and animals as well as people, is required for human societies to live in harmony with the natural world on which they depend for their survival and well-being” (Naess in Payne & Newman, Eds., 2005, p.241-242). Key to my discussion, however, is what he followed this with, claiming:

such an ethic would surely be more effective if it were acted upon by people who believe in its validity, rather than merely its usefulness. This, I think, will come to be understood more and more by those in charge of *educational policies* [emphasis added]. Quite simply, it is indecent for a teacher to proclaim an ethic for tactical reasons only (p.242).

An ecocentric ethic means that humans are learning to see themselves as part of a larger environmental system, not separate and elevated in the Cartesian sense. This understanding leads to human attitudes, knowledge, and actions of care and respect for the natural environment.

It is over 30 years since Naess wrote those words, and today educational scholars have joined in the chorus of thinkers calling for changes to the way humans interact with the planet. Academics, researchers and educators in the field have written reams of pages on the inadequacy of current approaches to public education and the imperative that changes be made in order to address the environmental question. Included in those writing on the need for educational reform was the late educational theorist Chet Bowers who emerged as one of North America's foremost critics of contemporary public education in the 1980s. All texts written in Bowers' career since the mid-1980s have situated reform of public education for ecoliteracy as their foundation, a conscious commitment to the environmental crisis, and an ideal that Bower's terms "recovering the ecological imperative" (Bowers, 2003, p.xi). Since this time he has investigated the connection between ecological devastation and atomization in society (Bowers, in Darder et al., 2009), reliance on technology (Bowers, 2003), language (Bowers, 2003), and has called for looking to indigenous populations as a source of guidance for navigating away from the era of the anthropocene (Bowers, 1987).

Bowers outlines his perspective on contemporary education's connection to the environment most fully in *Culture of Denial* (1997). Here he states,

[It is] increasingly difficult to ignore the connections between the high-status forms of knowledge promoted by public schools and universities and the ecological crisis... Few public school teachers and university professors recognize how modern values and

behavioural patterns are connected to the ecological crisis, it will become increasingly necessary for environmentally conscious groups to challenge what is being taught in our educational institutions (Bowers, 1997, p.1-2).

Unless we make a change in the content and delivery of information, Bowers warns that, “there will be an unending series of environmental problems that will keep attention focused on the immediate consequences of these cultural beliefs and practices, and not on the source of the problem” (Bowers, 1997, p.18). Bowers is arguing that rather than educational institutions playing a role in improving the relationships between humankind and the planet, they have merely exacerbated them. To what extent the Manitoba Senior Years curricula is part of this process indicated by Bowers will be the focus of my research.

Orr (1994) claims that educators can play a key role in environmental conservation, but that they themselves “must become students of the ecologically proficient mind and of the things that must be done to foster such minds” (Orr, 1994, p.3). Yet like Bowers, Orr considers that we are continuing to educate like there is no planetary crisis, placing instead blind faith in technology to save us (Orr, 1994). Likewise are Jacobson, McDuff and Monroe (2006) who consider “people are part of the problem and public education will be part of the solution... conservation education and outreach programs are a critical component in changing course toward a more sustainable future” (Jacobson, McDuff and Monroe, 2006, p.1).

New approaches to teaching.

What institutional modifications do scholars put forth in response to these challenges? Gadotti (2010) suggests that most education systems promote unsustainable education practices and that we should reorient towards experiential and participatory social learning (Gadotti,

2010). This transformation would “integrate the local economy (sustainable consumption); energy efficiency (green technologies, renewable resources, responsible consumption); human interactions (human rights, shared principles, power relations); and biodiversity (ecological interactions). These elements are gathered into a systematized knowledge and into new habits for sustainable living” (p.207).

Quilley (2009) sites school curriculum as an ideal location for developing the skills necessary for a new global climate and a transition away from fossil fuels. The present education system is designed to equip students with specialized functions within the economy, despite an increase in complexity of both the economy and society. The mechanization and computerization of work has led to a deskilling of society in artisanal, craft and agriculture, which extends into the service, leisure and domestic sectors (Quilley in Stibbe Ed., 2009). These skills will be essential in a post-carbon economy, but at present are lacking or non-existent in most public school classrooms.

Taking a community based approach, over a purely environmental, Berry (2007) outlined his vision demanding we ‘change the standard’ for a quality education, focusing instead on the health of the community. “Once you begin to ask what would be the best thing for our community” he claims, “you can’t rule out any kind of knowledge” (Berry, 2007, p.100). This invokes the writing of Paulo Freire who argued that the purpose of schooling should be critical consciousness that reveals structural inequalities, creates an urgency to address them, and an opportunity for praxis in the local community (Freire, 2011).

Phillips (in Stibbe Ed., 2009) believes that “all education institutions will have to respond to the imperative to nurture such individuals within the communities they serve, and to

incorporate them at the heart of decision-making” (p.210). Further, that a range of opportunities for sustainable living skill development such as “the courage to take risks; the capacity to work under pressure; the willingness to deal with setbacks; intellectual flexibility and innovative thinking; confidence to work when there are no ‘right’ answers; co-operation as well as competition; and understanding of social, environmental and economic well-being” (p.213).

Critical pedagogy.

So far I have provided an outline of terms pertaining to environmentalism, and perspectives on education for environment. Before I draw these two pieces together, I will need to briefly discuss critical pedagogy, a theory that will ground the connection between these elements. Critical pedagogy is an educational philosophy branching off from critical theory that makes the link between education and systemic oppression, power and capitalism. One of the cornerstones of critical pedagogy is Antonio Gramsci who in *Prison Notebooks* (1985) identified the purpose of primary education as work preparation transmitted between society and the learner through teacher instruction (Gramsci, 1985). Teachers could be deployed as mechanisms of social control he argued, ingraining social norms, expectations and behaviours of those in power, even if it ran contrary to the best interests of the student (Darder et. al., 2009, p.6).

Connecting with the ideas of Gramsci after the Second World War was the Frankfurt School, a collective of thinkers including Horkheimer, Adorno, Marcuse and Fromm who were concerned with adapting principles of Marxism to align with a different world from which Marx was writing (Darder, 2009). Beginning in the 1960’s critical theorists viewed that individuals began to become acculturated to feel comfortable in relation to domination and subordination, a sort of Stockholm Syndrome, over that of equality and independence (Kincheloe, McLaren,

Steinberg, in Steinberg & Canella, 2012). The parallels between these ideas and critical pedagogy became more fully fledged with the writing of Paulo Freire, specifically his seminal text *Pedagogy of the Oppressed* (2011).

In *Pedagogy of the Oppressed* (2011) Paulo Freire critiqued the dominant approach to education, identifying and calling into question the role of teacher as keeper of knowledge. Freire described the ‘banking model’ of education, a practice whereby the teacher deposits knowledge into students who act as a receptacle. In the banking model there is no reciprocity between the learner and the content, no prior knowledge that students are expected to wrestle with to accommodate new learning, they are to act as sponges. Freire deemed a student-centred democratic practice that would engage student’s prior knowledge and current interests more in the learning process. He invoked ‘critical consciousness’, or the awakening of political consciousness as an imperative for democratic education (Freire, 2011).

Freire took the ideas of Dewey and added a revolutionary bent. Dewey was concerned primarily with the dismantling of structured rote learning, towards a more expansive, student centred approach that focused on the idea of personal experience. In *Experience and Education* (2007) Dewey stated, “sound educational experience involves, above all, continuity and interaction between the learner and what is learned” (Dewey, 2007, p.x). According to Dewey, conditions need to be developed by the teacher, so that these experiences are worthwhile and not detrimental to continued learning and growth. These conditions should be personal to the needs of the individual - a connection to themselves, their history, current context and future goals (Dewey, 2007). Whereas Dewey was primarily concerned with disrupting the power structure in

education, Freire's goal was to empower learners towards praxis, or taking action in their liberation.

Cummins and Sayers (In Darder et. al., 2009) outline three types of literacies: functional, cultural and critical. *Functional* literacies are what we might identify as traditional approaches to education, namely: a focus basics of reading, writing, arithmetic and vocational skills necessary to negotiate life in an industrial society. *Cultural* literacies broaden horizons to include larger questions of global citizenship and shared communities, including philosophical questions of meaning and how to live a good life, but locate this knowledge within social norms. *Critical* literacy on the other hand, “illuminates the unequal workings of power in society, allows people to understand the sociocultural workings of domination and oppression and acts as an ethical spur demanding greater justice and equality” (p.533). We might recognize how particular instruction or assignments provided to learners in a school might align with one of these literacies and how political discourse around what should be taught in schools often swings between functional and cultural, but rarely touches on critical literacy.

Critical pedagogy calls on teachers to support the development of “empowered, learned, highly skilled democratic citizens who have the confidence and the savvy to improve their own lives and to make their communities more vibrant places in which to live, work, and play” (Kincheloe, 2004, p.8). A further distinguishing component of critical pedagogy is the belief that teachers should view themselves as researchers, seeking a wider and deeper understanding of the power structures that shape the learners in their classroom. An educator who can, for example, identify the impact that the cycle of poverty is having on a family which impacts a child coming to school unfed, an educator aware of the hangover legacy of Residential Schools and how that

might play out in violence at home, an educator that understands the systemic racism that prevents parents from gaining secure employment, is a critical educator leading their work with critical thinking and empathy.

Herein lies the power of critical pedagogy. I believe that all forms of education are political - you can either work within the system for the status quo, or become a revolutionary teacher, working from a position of power to raise the consciousness of those around you against all forms of inequality and prejudice. Critical pedagogy empowers the educator to approach the classroom as a space of potential liberation and provides the language of discourse in doing so.

The hidden curriculum.

Critical pedagogy insightfully sees the curriculum as a key political tool in education. As a consequence, critical pedagogy expanded the term *hidden curriculum* to refer to values, views, behaviours that emphasize competition, consumerism and private ownership than is present under the surface of the written curriculum (salehi & Mohammadkhani, 2013). In the hidden curriculum, certain forms of knowledge are omitted, while individualism is valued as the source of success over collaboration which legitimizes existing class dominance (Sanchez & Barber in Steinberg and Canella Eds., 2012). Eisner writes that the hidden curriculum differentiates from the implicit curriculum, as the implicit curriculum includes considerations such as the organizational structure of the school, pedagogical rules and even the school building itself (Eisner, 1979).

Schools, writes Eisner, are 'educational churches', the Gods of which are economy and efficiency (Eisner, 1979). Similarly, Carspecken (in Steinberg and Canella eds., 2012, p.65) argues that the hidden curriculum in schools subtly socialize children differently based on class,

race and gender, “in a way that has functions for the division of labor and distribution of wealth in society as a whole” (p.65). According to Apple and Giroux (in Breunig, 2005), “the ideals and culture associated with the dominant class were argued to be the ideas and content of schooling. Therefore, knowledge and classroom practices also affirm the values, interests and concerns of the social class in control of the material and symbolic wealth of society” (Breunig, 2005, p.113). Importantly, the hidden curriculum remains covert in the structure of a school or in the language of curriculum. Sanchez and Barber (in Steinberg and Canella eds., 2012) believe that a critical teacher is aware of these biases and therefore infuses his or her courses with critical pedagogy, “transforming oppressive structures in society using democratic and activist approaches to teaching and learning” (in Steinberg and Canella eds., 2012, p.432). What these authors are pointing to, is that often the hidden curriculum promotes knowledge, attitudes and actions that are contrary to those aligned with living with care and respect with the planet in mind. With this in mind, how can we expect teachers who follow the curriculum and students who soak up this learning to think or act in any other way?

The null curriculum.

The *null curriculum* is a term developed by Eisner (1979), which applies to what is not taught in schools. Eisner included examples such as anthropology, law and visual arts as examples of vital knowledge that is either absent or rarely seen taught in the classroom. If education for environment is absent or underrepresented in the Manitoba curriculum, this is problematic, because as Eisner argues, when something is not taught, it has implications on the “kinds of options one is able to consider, the alternatives that one can examine, and the perspectives from which one can view a situation or a problem” (p.97). This of course has huge

ramifications on education for environment, as when the status quo (read: capitalist consumer culture) is not questioned or alternative provided (read: living with the natural environment), then we will be challenged meeting the needs of the planet. As Eisner concludes, “in the deliberations that constitute the course of living, the absence of alternative ways of living will have important consequences on the kind of life that students can choose to lead” (p.107). Because it limits controversial or contradictory knowledge that might question the status quo, null curriculum offers a form of indoctrination to the current practices and beliefs in society.

Critical pedagogy and curriculum.

The path of the critical educators of course, is not easy. The ‘Great Denial’ is what Kincheloe terms the approach adopted by conservative educators. This is where curriculum is observed as a neutral document, presenting unbiased perspectives and non-political knowledge (Kincheloe, 2004, p.10). These observers claim that education should not be seen, used or approached as a political institution, and curriculum as a political tool. Critical theorists counter that this view is not grounded in an understanding of power, and that schools and in particular curriculum are inherently political, as with every decision of what to include in learning outcomes and conversely excludes another perspective. Further, those in power use curriculum to extend and legitimize current power structures (salehi & Mohammadkhani, 2013, p.62). In general, critical pedagogists believe that school curriculum “should be shaped by problems that face teachers and students in their effort to live just and ethical lives. Such a curriculum promotes students as researchers who engage in critical analysis of the forces that shape the world” (Kincheloe, 2004, p.16). Are Manitoba educators supported in this approach by the curriculum in education for environment?

Questions that critical educators might consider in their approach to the classroom and curriculum are: do I teach to socially regulated workers with the proper attitudes for their respective rung on the workplace ladder? Or do I teach to empowered, learned, highly skilled democratic citizens who have the confidence and the savvy to improve their own lives and to make their communities more vibrant places in which to live, work and play? (Kincheloe, 2004, p.8). Kincheloe sums up critical pedagogy, outlining that “every minute of every hour that teachers teach, they are faced with complex decisions concerning justice, democracy, and competing ethical concerns... every dimension of schooling and every form of educational practice are politically contested spaces” (p.1). This presents a challenge to educators who aim to provide critical learning environments from which thinking and praxis can take place. But what happens when we bring a critical perspective to teaching on environmental issues? What questions and perspectives might we need to consider? How might we approach our practice? What goals should we set for our learners? Ecopedagogy, a relatively new field in education, aims to bring the environmental and critical pedagogy worlds together.

Ecopedagogy.

Whereas the field of critical pedagogy has flourished in recent decades, drawing in race, gender, class as essential to the critique of capitalism, a review of available literature suggests that connections between critical theory and the environmental movement have been much slower to develop. As outlined, owing to the breadth of its perspective, critical pedagogy can offer us a strong operational foundation. With our focus on the environmental question, a narrowing of the framework will be required. This is where the role of ecopedagogy fits within my study.

Kahn (in Darder et. al., 2009) developed the term ‘ecopedagogy’ as an attempt to blend critical pedagogy and education for environment. As he correctly asserts, if we are to ‘overcome previous theoretical limitations’ and move both terms towards a more inclusive critical and transformative approach to education, a uniting of these concerns is necessary (Kahn in Darder et. al., 2009). Ecopedagogy, writes Kahn “is the key process by which we might fend off the worst aspects of today’s globalization, and realize more of the utopia in which non-human animals, oppressed peoples, and the planet are not wholly exterminated, but rather ecumenically brought into a new ecological society generally” (Kahn in Darder et. al., 2009, p.525). Further, it is an effort to,

interpolate quintessentially Freirian aims of the humanization of experience and the achievement of a just and free world with a future-oriented ecological politics that militantly opposes the globalization of neoliberalism and imperialism, on the one hand, and attempts to foment collective ecoliteracy and realize culturally relevant forms of knowledge grounded in normative concepts such as sustainability, planetarity, and biophilia on the other” (Kahn, 2010, p.18).

Ecopedagogy therefore offers an environmental perspective guided by the framework of critical pedagogy.

Like many critical theorists, Kahn is explicitly critical of capitalism, specifically techno-capitalism, which he identifies as ‘the single underlying cause’ of the environmental crisis (Kahn in Darder et. al., 2009). Technocapitalism is defined as “an evolution of market capitalism that is rooted in rapid technological innovation and its supporting intangibles” and includes innovations in software, communications, micro-processors, logistics, and computing

(Suarez Vila, 2003, p.390-391). The rise of technocapitalism has undoubtedly ramped up the ability of humans to create, produce and consume, scouring the planet for natural resources at ever increasing levels. Technocapitalism can be traced back to the industrial revolution, but has accelerated in recent decades to the extent that today there is “no ecology of symbiosis... no ecology of mutuality and compassion... this exists not by accident, but rather as a result of concrete historical forces in our world - many of which have coalesced into a global techno-capitalist spectacle” (in Darder et. al., 2009, p.523). The increasing capacity of industry to create, destroy, expand and consume is escalating the collapse of natural resources and the ability of the natural environment to renew and sustain. Kahn (2008) developed an eight-point list of general principles for ecopedagogy as detailed in Table 1.

Table 1

The Principles of Ecopedagogy (Kahn, 2008, p.iii-iv)

<p>1. Ecopedagogy’s aim is to realize the planetary peace, happiness, justice, and beauty that would be manifested by sustainable social and cultural relations between the peoples of the Earth.</p>
<p>2. Ecopedagogy recognizes that sustainability is not being realized because, in large part, it represents the antithesis to the political, economic, and cultural status quo of the powerful forces now fuelling the growth of a globalize mono-society of militarism and transnational capitalist development agendas.</p>
<p>3. Ecopedagogy involved mounting creative and emancipatory political action based in formative dialogue across a wide range of interested parties, the rigorous critique of</p>

society and its political economy, and learning from the standpoints of the oppressed.

This translates into the process of the art of listening to and speaking with a collective of oppositional voices.

4. Ecopedagogy involves understanding both education as politics and politics as education, which is to say that for the transformation of society towards sustainability, there must be a greater politicization of education just as there must be a more thorough-going attempt to educate the political sector.
5. Ecopedagogy is unabashedly utopian - not in the sense of idealistic daydreaming about the possibility of another sort of world, but rather ecopedagogy is uncompromising in its refusal to accept the suffering of this one as de facto. Thus, ecopedagogy recognizes as anticipatory of a future sustainable society those social, cultural and political projects that, in however limited a fashion, now alleviate suffering and aggression by working for the forces of life, diversity and lasting peace.
6. Ecopedagogy seeks the emergence of planetarity but also place-based regionality. We must recognize ourselves as earthlings, with all being representing our brothers and sisters, and yet sound ecological practice will result only from bioregional acts and understandings of our location and dwelling.
7. Ecopedagogy is anti-racist, anti-classist, anti-sexist, and anti-speciesist. It is against the ranking of oppressions, and instead seeks to understand the complex ways in which various forms of oppression co-originate or intersect due to common causes. Yet, it also recognizes that in any given instance, some forms of oppression may be more primary

than others, and so understanding how multiple levels of oppression arise or take historical precedence is equally important.

8. Ecopedagogy can and must occur in numerous points of struggle - in governmental and non-governmental institutions, in universities and colleges as well as secondary and elementary schools, in grassroots activist organizations, and the public at large - and each sector will face different challenges and require different objectives as part of a broad-based movement for ecologically sound social transformation. Sometimes this will require emphasis upon theory, other times practice.

Ecopedagogy is inherently critical in its view of curriculum and society. Jardine (2010) states that ecopedagogy serves as an alternative to the compartmentalized approach and

‘assembly line model of curriculum, and instead

draws upon ideas, assumptions, and images from ecology—interdependence, relationships, landscapes, fields, habitats, generativity, renewal, cycles—and uses these to place or locate curriculum objectives or ideas back into the conceptual and disciplinary locales that make them what they are (Jardine, 2010, p.313).

Ecopedagogy advocates for an integrative approach to learning, over the siloing and separating of subject areas. Misiaszek (2015) states that “an essential principle of ecopedagogy is the impossibility of separating the social from the environmental” (Misiaszek, 2015, p.589). As I will show later on in this chapter, ecopedagogues (educators who philosophically align themselves with the ideas and practice of ecopedagogy) suggest a common conflict in education

for the environment is that the integrative teaching over separation of subjects is a barrier to effective learning on the environment.

As with a Friirian approach to pedagogy, ecopedagogy is concerned with constructing praxis. Ecopedagogues meet this goal by problem posing, asking ‘who benefits?’ and ‘who is being negatively affected?’ and then encouraging action and driving students to “focus on the politics behind environmentally harmful actions, the normative systems and structures of society guiding these actions, and the deeper, transformative steps needed to end these actions” (Misiaszek, 2015, p.590). Because creating change is so valued by ecopedagogues, learning without action is not valued as highly.

We can observe globally, nationally, and locally that education for environment to date has been too isolated as a discipline, and has failed to integrate with other dominant discourses, has been too timid in its approaches (in Darder et. al., 2009; Kahn, 2010), and been unable to provide effective solutions (in Darder et. al., 2009). If this were not the case then our educational and environmental realities would look quite different. The devastation of the planet has resulted in extreme wealth for many, particularly in the West, leading to a widening gap between the haves and the have-nots. By 2030, recent reports suggest the richest 1% of the planet will control two-thirds of the wealth (Savage, 2018). Wealth in particular can provide mobility, and the ability to live in areas free from exploitation, whereas the have-nots (many of whom are women and children) are forced to live in what Naomi Klein refers to as ‘sacrifice zones’ (Klein, 2014).

Ecopedagogy provides a worldview, yet it recognizes that ecoliteracy is a global awareness that begins in one's own community. Ecopedagogy is a utopian project, with its sights

on changing, social, cultural and importantly economic structures (Antunes & Gadotti, 2006).

The aims of ecopedagogy are to educate each of us to think globally, educate feelings, each about the Earth's identity as essential to the human condition, shape the planetary conscience, educate for understanding, and educate for simplicity, care, and peacefulness (Antunes & Gadotti, 2006).

It is my view that at present public schools in Manitoba are operating at two levels. Learning about the environment is either absent in the classroom (null curriculum), or occasionally present in classrooms (environmental education / education for sustainable development). What I propose is that we need to move towards ecopedagogy in our public schools, where a critical perspective of society accompanies education for environment, forming the foundation of all learning in all levels of education. The United Nations and the Earth Charter (2000b) are powerful forces for advocating a shift towards this direction.

The Brundtland Report

In 1987 the United Nations released *Our Common Future*, better known as the Brundtland Report. This document cited education as a key component in developing “changes in attitudes, in social values, and in aspirations” (United Nations, 1987, n.p.). The report considered that alongside non-governmental organizations and the scientific community, educational institutions “will play a crucial part in putting the world onto sustainable development paths, in laying the groundwork for Our Common Future” (World Commission on Environment and Development, 1987, n.p.). Working together these institutions need to support citizens becoming more skilful, productive and better problem solvers, and can do this by being

relevant to local conditions, knowledge of soils, water, deforestation, and supportive in how the community and the individual can reverse environmental destruction (World Commission on Environment and Development, 1987). Crucially for my study, the report called for education for environment to “be included in and should run throughout the other disciplines of the formal education curriculum at all levels - to foster a sense of responsibility for the state of the environment and to teach students how to monitor, protect, and improve it” (World Commission on Environment and Development, 1987, n.p.).

Our Common Future (1987) went on to cite the importance of taking a localized approach to changing systems of education, with learning in theoretical and practical experiences. Students, it argued, should have the opportunity to develop hard skills and knowledge in management of local resources, the local soils, water, and not just the conservation of both, but the regeneration of depleted or damaged resources, and soft skills in creative productive problem solving (World Commission on Environment and Development, 1987). To meet these ends, educational institutions would need to ensure that learning for sustainable development encompasses and cuts across social and natural sciences and the humanities, “thus providing insights on the interaction between natural and human resources, between development and environment” (World Commission on Environment and Development, 1987, n.p.).

As suggested in the title, the document itself served as a starting point for a larger conversation amongst organizations educational institutions around the world towards a common objective. Ultimately this led to a plan for development of a charter to represent the values of *Our Common Future*, resulting in the Earth Charter (2000b).

The Earth Charter (2000b)

An independent commission of the United Nations following the 1992 Rio Earth Summit created the Earth Charter (2000b). It was the culmination of an extensive consultation process with over 5000 individuals, including scientists, government, students, indigenous groups and grassroots communities (Clugston et. al., in Leal Filho, 2002). This culminated in “a global consensus statement of values and principles for a sustainable future,” and a call for unity “to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace” (Earth Charter, 2000b). The Earth Charter (2000b) outlines challenges facing humanity and the planet that sustains us, and argues that there is a need for “principles for a sustainable way of life as a common standard by which the conduct of all individuals, organizations, businesses, governments, and transnational institutions is to be guided and assessed” (Earth Charter, 2000b, para. 5). Since release, it has been endorsed by thousands of organizations, including UNESCO and the World Conservation Union. As detailed in Table 2, the Earth Charter (2000b) is divided into four sections and sixteen principles.

Table 2

The Earth Charter (2000b)

Section	Principles
1) Respect and Care for the Community of Life	<ul style="list-style-type: none"> ● Respect Earth and life in all its diversity. ● Care for the community of life with understanding, compassion, and love. ● Build democratic societies that are just, participatory, sustainable, and peaceful.

	<ul style="list-style-type: none"> ● Secure Earth's bounty and beauty for present and future generations.
<p>2) Ecological Integrity</p>	<ul style="list-style-type: none"> ● Protect and restore the integrity of Earth's ecological systems, with special concern for biological diversity and the natural processes that sustain life. ● Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach. ● Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being. ● Advance the study of ecological sustainability and promote the open exchange and wide application of the knowledge acquired.
<p>3) Social & Economic Justice</p>	<ul style="list-style-type: none"> ● Eradicate poverty as an ethical, social, and environmental imperative. ● Ensure that economic activities and institutions at all levels promote human development in an equitable and sustainable manner. ● Affirm gender equality and equity as prerequisites to sustainable development and ensure universal access to education, health care, and economic opportunity. ● Uphold the right of all, without discrimination, to a natural and social environment supportive of human dignity, bodily health, and spiritual well-being, with special attention to the rights of indigenous peoples and minorities.

<p>4) Democracy, Nonviolence & Peace</p>	<ul style="list-style-type: none"> ● Strengthen democratic institutions at all levels, and provide transparency and accountability in governance, inclusive participation in decision making, and access to justice. ● Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life. ● Treat all living beings with respect and consideration. ● Promote a culture of tolerance, nonviolence, and peace.
--	---

(United Nations, 2000b)

Discussion of the Earth Charter (2000b).

Ecopedagogy aligns effectively with the principles of the Earth Charter (2000b) in a number of ways. Firstly, it draws on considerations of human rights and economic justice, is critical of dominant patterns of production and consumption that are directly responsible for environmental devastation, the depletion of resources and extinction of species, and calls for a global effort beginning in local communities to work towards reversing these trends (Earth Charter, 2000b). Secondly, the premise of the Earth Charter (2000b) according to Clugston et. al. (in Leal Filho, 2002) is that at present, many societies around the world are unsustainable, and humanity as a whole is responsible for environmental degradation and climate change. I believe that the Earth Charter (2000b) can provide a valuable guide to measuring the effectiveness of Manitoba curriculum in an effort to move our provincial public schools towards ecopedagogy.

The Earth Charter (2000b) has been considered by critical theorists such as Richard Kahn, Moacir Gadotti, David Gruenewald and Richard Clugston as a valuable benchmark from which developing ecopedagogy can orient. Clugston et. al. (In Leal Filho, 2002) declare it a “potent force for change in the way we think about the Earth and ourselves” (p.2); Gruenewald (2004) states that it is a document that “is able to negotiate the complex ecological interactions between science, politics, and culture, between social and ecological systems, and their impact on human and nonhuman life” (Gruenewald, 2004, p.94). Likewise Sauer (2002) called it “a statement of standards by which people may measure progress toward a just and sustainable society” (Sauer, 2002, n.p.).

In outlining how educators might utilize the Earth Charter (2000b) in their practice, Clugston et. al., (in Leal Filho, 2002) identify two roles: firstly, it be employed as a framework and source of content for education for sustainable living, and secondly as a catalyst for promoting an ongoing multi-sectional dialogue on global ethics (Clugston et. al., 2002). In other words, the Earth Charter (2000b) blends education for sustainable living with a critical perspective on contemporary society. Gruenewald (2004) laments the defanging of education for environment, a discipline he contends began with the aim of transforming education, but through its institutionalization has lost all meaning and should be abolished (Gruenewald, 2004). Importantly for my study, Gruenewald looks to the Earth Charter (2000b) as a statement of specific standards to which educational policy can be evaluated (Gruenewald, 2004).

Attunes and Gadotti (2006) directly link ecopedagogy and the Earth Charter (2000b). They argue that the ethic of caring for fellow humans and the planet we live on lies at the heart of the document. The authors state, “eco-pedagogy implies redirecting curricula to incorporate

values and principles defended by the Earth Charter (2000b). These principles should guide content, concepts, and the preparation of didactic books” (Attunes & Gadotti, 2006, p.136). Indeed as documented by the United Nations in *Good Practices in Education for Sustainable Development Using the Earth Charter*, the principles of the Earth Charter (2000b) have and continue to be adopted by K-12, postsecondary and non-formal educational organizations as a framework for their pedagogy.

Further evidence of a relationship between the Earth Charter (2000b) and ecopedagogy can be found in the preamble of the Earth Charter itself. The opening passages detail that “the dominant patterns of production and consumption are causing environmental devastation, the depletion of resources, and a massive extinction of species” (Earth Charter, 2000b), which makes direct connections to free market capitalism and questions economic globalization. The Earth Charter (2000b) also argues that the root of climate change and ecological devastation as the result of local and global economic development patterns that are also at the root of injustice, poverty, violence, and oppression (Earth Charter, 2000b). We can see that the Earth Charter (2000b) is both viewed by itself and other as the critical document that we need for our times.

Overview of Studies

Public education, and consequently curriculum in Canada fall under provincial jurisdiction. As my research question applies directly to Manitoba curriculum, care needs to be taken in not misrepresenting the research from one part of the country or continent to the Manitoba context. For the most part, the following section will consider investigations on

education for environment conducted on and in Manitoba. However, a handful of studies do speak directly to my research area, or methodology, and will also be summarized.

Broadly speaking research on education for the environment in Manitoba can be divided into two categories: firstly, studies seeking to understand how effectively education for environment can or has been implemented into schools; and secondly, studies seeking to gauge student attitudes and behaviours as a result of education for environment programming. Babiuk and Falkenberg's 2010 study bridged both of these research questions with a larger investigation on ESD in Manitoba and will conclude this section.

Studies on the implementation of education for environment.

Beginning with a study that looked nationally at education for environment, but with implications for Manitoba, Hart (2002) investigated the problems that may emerge when attempting to incorporate environmental education outcomes (EE) into the currently dominant Science, Technology and Society (STS) curriculum as informed by the Pan-Canadian curriculum (to create STSE). He advocated a shift towards incorporating environmental education learning outcomes into science curriculum as a means to tackle problems with science among young people, to raise international test scores, mitigate distress about social and community-based issues, and to make science more authentic.

Hart's findings suggest there are problems that may arise from such a move. Firstly, he indicates that some of the motives of science are based on an industrialist principle that present "an aggressiveness that contravene the kind of respect for nature that some would argue should be at the heart of environmental education" (p.1246). Discussion of environmental ethics poses a contradiction to scientific learning, as it forces the abandonment of neutrality and

scientific/technical rationality (Hart, 2002). As advocated by many (Kahn, 2010; Clugston, 2002; Gadotti, 2010), teaching for ecopedagogy demands participation in socio-democratic action, a worldview Hart (2002) considers a distinct practice from science teaching (Hart, 2002). What this conclusion from Hart suggests is that science as a subject may need to soften its overly structured approach to what science teaching and knowledge looks like. Certainly the introduction of ethical questions and educating on the application of positive environmental behaviours based on scientific knowledge could be valuable.

A second concern for Hart is what he perceives as a reluctance of science teachers to engage in any instruction that pushes them out of their comfort zone; although science teachers respect the Pan-Canadian science curriculum, he reported they don't care for policy debates or curriculum decisions (Hart, 2002). This concern is certainly more problematic for trying to blend teaching of education for environment content, as it presents an approach to classroom instruction that may run counter to how science teachers have been conditioned to teach, or how they view the most effective way to address meeting curriculum outcomes. As with Hart's first point, what this study suggests is that science teaching could benefit from incorporation of non-traditional content areas, opportunities for application of environmental knowledge, or a larger move away from the siloing of science as a subject and the rejection of integrating non-science content.

A collaborative study between Don Metz at the University of Winnipeg, and Barbara McMillan, Mona Maxwell and Amanda Tetrault at the University of Manitoba (2010) contrasted the experiences of integrating education for sustainable development learning in a Manitoba high school to that of Colegio Ambientalista Isaias Retana Arias (CAIRA) in Costa Rica. The

researchers collected data on curriculum, teaching perspectives and practices and contrasted them between the two sites (Metz, et. al., 2010).

The authors concluded that the knowledge and behaviours of students differed widely, with the Manitoba case study showing lower levels of knowledge and pro-environmental behaviours. They argued that this was the result of the Manitoba learner experiences being confined to ‘islands of excellence’, whereas in the Costa Rica case, a ‘whole school approach’ to education for environment meant learning permeated all subjects throughout the school day and year. The research conclusions led them to state that “curriculum, naturally, influences any form of [ESD] implementation” (Metz, et. al., 2010, p.153), and that attempting to situate education for environment within a highly discipline-oriented approach to schooling is problematic to achieving needed pro-environmental knowledge and behaviour (Metz et. al., 2010). As a result, Metz et. al., (2010), recommended that ESD courses be made compulsory in Manitoba. For this to be achieved however, there needs to be a

‘redesign and merger’ of the Grade 10 courses in science and social studies, using ESD as the context, guided by the necessary outcomes from the disciplines, and incorporating a significant local component which puts our young people in the field of studying and helping to solve community problems (Metz, et. al., p.166).

Doing so would,

make available the time needed to overcome scheduling difficulties and allows for a significant participatory component in the local community... [and] could lay the foundation for good science learning, civic participation, and awareness of, and informed action towards, the long-term health of local communities. Greater awareness of

environmental issues should give such a proposal the necessary currency and advance a long overdue innovation in Manitoba's schools (Metz et. al., 2010, p.166).

What these authors are suggesting then is that despite the efforts of Manitoba Education to increase student knowledge and behaviour in education for environment, we need to move beyond increasing the content in the courses that are perceived to have connections to this learning, such as social studies and science. Instead moving towards the restructuring of the school day, and taking a holistic approach to these practices is more likely to raise the consciousness to the extent demonstrated at CAIRA. Their concerns imply both a reconfiguration of school structure, and a new approach to curriculum where education for environment permeates all subject areas.

Also contrasting the experiences of overseas approaches to ESD with the Manitoba context, Belton's (2013) qualitative study collected data from 36 leaders in education for environment in Canada, England and Australia to determine their perceptions of current practices, successes, drivers and barriers to ESD in their respective locations. Leaders came from a variety of backgrounds including universities, positions as ESD coordinators, school administrators, teachers, and workers at non-governmental organizations. Of note, Belton's participants from Canada were often based in Manitoba.

Belton's interview responses briefly reference the role of curriculum in the implementation of ESD. In England, where there was support from staff towards the initiative, incorporation of ESD principles to the curriculum was present; in Australia, an overcrowded curriculum was lamented as a barrier to greater ESD teaching; and in Canada there were concerns of a lack of support for educators to include ESD principles, and that classroom

teachers thought too narrowly of their curricular areas (Belton, 2013). Belton states that “curriculum will need to be scrutinized and updated to allow for meaningful measurement of students understanding and attitudes and [*sic*] well as actions in the realm of sustainability” (Belton, 2013, p.41). The study suggested a consensus amongst participants that having dedicated support positions, strong partnerships, and integrating ESD into the core curricula were all important for moving ESD forward (Belton, 2013).

It is interesting to note that the examples of Canada, Australia and England have all shown a willingness to increase education for environment in their schools, and yet, have all suggested that they are not seeing evidence of the progress that is required. These case studies are drawn from schools that operate a traditional school structure with the separation of school subjects. Belton concludes that despite much being accomplished in Canada, England and Australia in terms of increasing the presence of ESD in public education, “none seem satisfied that we have reached our goals for ESD, there is much for these champions of sustainability to be proud of, and based on their comments it would appear as if the work would continue with intensity” (p.95). One wonders if Belton would have drawn a conclusion had he been able to include voices and examples from schools that have integrated subject areas and taken a whole-school approach to ESD as outlined in the Metz et. al. (2010) study?

Henderson (2016) developed a curriculum founded on the focus for a series of experiences that would take into consideration the concerns detailed in the above-mentioned studies, and doing so provide a strong ecological foundation for learners in Manitoba. Henderson highlighted that Western industrial society suffers from a ‘knowledge-gap’ (knowledge deficiency in the multi step causal human impact on the planet) and the

‘knowledge-action gap’ (an unwillingness from humans to undertake actions that are in the best interests of the planet, even if they are capable) (Henderson, 2016). As a result he argues “learners need to be immersed in educative experiences which reveal how they are interconnected and interrelated with all systems on Earth. These empowering experiences need to lead towards learner-driven action, transformation, and a new ecological literacy” (p.14).

To achieve this goal, Henderson presented an utopia-inspired vision of a Whole Ecosystem Experience School (WEE School), that drew together ecological literacy and experiential education. He identified 12 criteria, the first five of which inform the design of curriculum and learning outcomes, and the last seven evaluate meeting learning expectations, and many of which have links to the Earth Charter (2000b). Namely: (1) Develops empathy for all forms of life; (2) Embraces sustainability as a community practice; (3) Makes the invisible visible; (4) Anticipates unintended consequences; (5) Understands how nature sustains life. Whether a learner has achieved outcomes is measured by: (6) A democratic environment is cultivated whereby there is social interaction and discourse; (7) Opportunities for growth and transformation are present; (8) Change in direction of the learner’s attitudes and behaviour is evident; (9) Interaction between inner and outer conditions are continually at play; (10) Dialogue is an essential element of learning; (11) Reflection and time and space for reflection are considered paramount to learning; (12) Praxis is considered a key element to learning (Henderson, 2016). These outcomes were developed as a result of Henderson not viewing the current Manitoba curriculum as sufficient enough to address the aims of cultivating ecoliteracy in youth.

The WEE School experience would send senior level students through a series of eight-week placements in Saskatchewan, Manitoba, Nunavut, North Dakota and Northwestern Ontario. As stated by Henderson,

these placements provide immersive experiences in a variety of ecosystems, drainage basins boundaries, physiographic regions, and land masses which impact Manitoba, ecologically, socially, politically, and economically... these rotations take them into wetlands, boreal forest, arctic environments, Precambrian shield, traditional prairie, urban areas, First Nations communities, and a variety of mixed-ecosystem areas (p.86).

What stands out from Henderson's thesis is the extent that his utopian-curriculum departs from a traditional classroom-learning environment. By adopting the principles of ecoliteracy from Goleman et. al. *Ecoliterate* (2012) in designing curriculum, Henderson recognizes the extent that student learning needs to take place in the field, rather than within the school walls. Learning is not siloed, and curriculum is integrated through these immersive experiences.

Studies on attitudes and behaviours in education for environment.

Kraljevic (2011) employed a mixed-methods approach to answer whether the Manitoba Grade 10 science curriculum has led to the necessary knowledge skills and attitudes to act for environmental change. Kraljevic compared the data from 96 Grade 9 and 79 Grade 10 students at a single Winnipeg high school (Kraljevic, 2011). He used surveys, focus groups and interviews with students, supporting or discrediting verified by observing recycling habits of the students. Findings of the study concluded that there was very little difference in self-reported pro-environmental behaviours, or knowledge of environmental terminology (Kraljevic, 2011). Interestingly, students of both Grade 9 and 10 both overwhelmingly cited science class as the

source of most of their environmental knowledge from school, with social studies coming in second. Stand out results from the teacher survey included the majority of respondents (61%) stating that education for environment should be taught across all curriculum areas, but only two of the 14 high school science teachers believed that environmental awareness or sustainable development content should be taught in all high school science courses (Kraljevic, 2011). Kraljevic concluded that “the Manitoba science curriculum appears to instil positive attitudes toward the environment but this did not translate into pro-environmental behaviours in the context of waste disposal” (Kraljevic, 2011, p.57). Kraljevic gets to the crux of our issue here – without transforming positive attitudes towards the environment into concrete actions, society will not see meaningful change.

In Jacques’s (2012) phenomenological case study, six leaders in education for environment were interviewed to uncover their beliefs and values, and how they came to situate themselves at the forefront of the drive for an increased ESD presence in Winnipeg high school classrooms, individuals he termed ‘Green Don Quixote’s’ (Jacques, 2012). Jacques completed semi-structured interviews with open-ended questions, in which educators focused on values beliefs and their meaning-making process. Participants were invited to follow up interviews for clarification (Jacques, 2012). Of note, Jacques sought out high school teachers of science over social studies, global issues or geography.

Notable findings of participant characteristics included: a strong knowledge of ESD principles, particularly concepts identified in the United Nations document *Our Common Future* (1987), concerns with the use of ‘sustainable development’, preferring instead ‘sustainable

living'; an equal amount of environmental teaching taking place inside as outside the classroom; and, active engagement with nature on the teacher's personal time (Jacques, 2012).

In terms of barriers that the educators faced, the responses focused on: a lack of time, struggles to fit environmental content within the curriculum; lack of support from their respective Division; student motivation; and personal burnout that built up in the last months of the school year (Jacques, 2012). These are responses echoed in Belton (2013). Jacques (2012) found that when an environmental course was offered in schools, it was perceived by students and faculty as easy, leading to disengaged or plagued by frequent absenteeism. Interestingly, the author concluded that the passion of a practitioner for teaching environmental content stemmed primarily from their experiences in nature as children, such as going for outdoor walks, camping, or playing in the garden, rather than formal education (Jacques, 2012). Of note to our study, at the time of writing Jacques cautions that inclusion of ecological literacy learning in their respective classrooms rested on the shoulders of these leaders in ESD, rather than being part of the fabric of a school-wide, divisional or provincial plan. As a result, he ends by recommending revisiting the idea of mandatory inclusion of high school courses with a focus on ESD and that these courses should be informed by the Earth Charter (2000b) (Jacques, 2012).

Eckton (2015) conducted a participatory action research survey at an urban Winnipeg high school to collect data on student attitudes and values on education for sustainable living. Thirty Grade 9 through 12 students of the 172 students participating in an Equity Conference completed Student Sustainable Living Values Survey and twenty-four Grade 9 through 12 students completed exit slips, along with ten teachers who completed an online Teacher

Sustainability Survey, eight of whom also participated in a matrix interview and focus group session (Eckton, 2015). Eckton, stated the purpose of the study was,

to allow students and teachers the opportunity to share their opinions on current and future school initiatives related to sustainability. Furthermore, the surveys served as a way to assess the existing school sustainability culture, establishing a baseline, which is an important step in order to guide future recommendations for teaching and learning within the school (Eckton, 2015, p.47).

Eckton drew four recommendations from the results. Firstly was the need to greatly increase student involvement in active learning for sustainability across curriculum areas. Secondly, a restructuring of the school timetable was advocated in order to facilitate the time needed to change curriculum. Thirdly, the need to encourage and allow space for student action for learners to apply their knowledge of ecoliteracy as an avenue for raising feelings of empowerment (Eckton, 2015). A fourth conclusion was that the consensus from students and teachers was that education for sustainable living should be a “central educational concern within the pedagogy of the school” (p.97). Yet, as with other study findings, a barrier to achieving these ends was a lack of time for planning and collaboration within an already overcrowded curriculum. This, Eckton (2015) pointed out, led to education for sustainable living learning moving out of the school day and into the realm of extra-curricular activity. As a result, she advocates that future curriculum development by the province should include inquiry-based curriculum to meaningfully incorporate ESL action projects.

These four conclusions from Eckton (2015) speak directly to my research question. The calls for spreading learning for sustainability across subject areas supports previously mentioned

studies that problematize siloing subject areas, and that the departure from blocking time for subjects would free up more space for integrative learning, and student praxis. What is also interesting to note is that 90% of teachers surveyed advocated a sustainable living curriculum – but details on whether this curriculum would be integrated across subject areas or by itself was not expressed.

Investigating student knowledge, attitudes and behaviours towards ESD, Michalos et. al. (2015), undertook a large random sample of 1551 Grade 10 students in Manitoba, representing 10% of Grade 10 students enrolled in the province in the 2009/10 school year. Again, the authors focused on Grade 10 students, as it is this age that they “should have received instruction in the basic social, environmental and economic dimensions of sustainability in their social studies, geography and science classes” (Michalos et. al., 2015, p.217). The authors used a five-point scale to gauge knowledge, attitudes and behaviours, with 0 being no evidence of knowledge, attitudes and behaviours, and 5 being the very high evidence of knowledge, attitudes and behaviours. Results from students averaged 2.12 / 5 for knowledge of central sustainable development themes and concepts, 2.14 / 5 for attitudes favourable to sustainable development, and 2.83 / 5 for behaviours supportive of sustainable development (p.229). Considering the previously mentioned changes that Manitoba has undergone in the decade preceding the Michalos et. al. (2015) study, these results should cause alarm. The authors concluded that despite concerns on the effectiveness of a small number of the questions to obtain accurate data on students, that the sample was “large enough that we suspect that the relationships [between students and principles supporting ESD] identified here are fairly consistent with what we would

find in a fully representative sample” (p.230). Indeed these results only echo the previously highlighted research conclusions.

Babiuk and Falkenberg study (2010).

Babiuk and Falkenberg (2010) undertook a major study in the Province of Manitoba supported by Manitoba Education and the Canadian Council on Learning (CCL). The baseline study solicited superintendents, administrators and school-based educators for interviews on a wide-ranging study on the state of education for sustainable development in Manitoba. The authors detailed six goals: (1) to identify the attitudes, competencies and understandings that are required for teachers to prepare students in Manitoba schools for sustainable living; (2) to identify possibilities in existing teacher education programs and professional development opportunities to support the development of those attitudes, competencies and understandings in teacher candidates and teachers in Manitoba; (3) to identify structural and pedagogical changes that would need to be made to existing teacher education programs and professional development opportunities to support the development of those attitudes, competencies and understandings in teacher candidates and teachers in Manitoba; (4) to assess the impact of developed teaching material and practiced teaching strategies in teacher education programs on student teachers’ development of those attitudes, competencies and understandings; (5) to assess the impact of developed teaching material and practiced teaching strategies on student engagement and learning for sustainable living in schools in Manitoba; and, (6) to identify policy requirements at the school, divisional and ministry level to support education for sustainable development and model sustainability in school operations (Babiuk & Falkenberg, 2010).

Focusing specifically on findings and discussion by Babiuk and Falkenberg (2010) relating to my study, multiple themes emerged from interviews with superintendents, principals and school-based educators. One was that ‘schools should focus on what really is important, and that particularly the current curriculum does not allow a focus on what really should count’. One participant argued that there was,

a mismatch between the principles of education for sustainability promoted by Manitoba Education and the curriculum mandated by it. At the core of this mismatch, she / he suggested, is the silo-ing of school education through discrete subject areas. She / he suggested that Manitoba Education’s current work on “essential learnings” should be linked directly with the principles of education for sustainability and allowing for an overcoming of this silo-ing and, thus, the mismatch” (Babiuk & Falkenberg, 2010, p.86).

Another voice shared,

we need to begin that journey of having a conversation about what do we plan to abandon in our school curricula in order to make room for this, because unless we’re going to add to our day and add to our year, my argument is we can’t continue (p.87).

Both of these voices raise concerns about the role of curriculum in promoting and hampering efforts towards teaching for education for environment in Manitoba. The first response presents the view that while the Province of Manitoba may ‘talk the talk’ with ESD, the outcomes for curriculum do not mean that the educators in the Province are able to ‘walk the walk’. The second voice echoes concerns that teachers already feel overloaded with curriculum outcomes, which leaves little space for teaching ESD.

A second theme raised from the Babiuk and Falkenberg (2010) study was that ESD needs to be integrated in all aspects of school division operations and curriculum, with one interviewee saying,

the way that a lot of curriculums have been written in the past is to compartmentalize everything into specific subjects and disciplines, and I think our world needs to break those disciplines down and to combine math with engineering, with social impact of the projects, and to look far more cross curriculum. So I think ESD is a perfect vehicle for doing that (p.90).

As outlined earlier by Jacques (2011), it became apparent during Babiuk and Falkenberg's interviews, that rather than ESD being integrated into the regular school day, much of the learning was set outside of regular classroom activities and curriculum and tended to be based in clubs and extracurricular activities. One assistant superintendent claimed, "I think some of this work in ESD at the upper grade levels has been moved more into clubs, environmental clubs, sustainable development clubs etcetera rather than the mainstream [curriculum] of what kids do every day," to which Babiuk and Falkenberg pondered, "what happens to the rest of the school population?" (p.97).

Babiuk and Falkenberg (2010) detailed that with many elementary classroom teachers instructing on multiple subject areas with the same students, some found success with integrating subjects to provide space for ESD (p.99). However, with few exceptions, this is an option often unavailable to a teacher at the senior years level. Curriculum consistently came up as a barrier to effective and broad based ESD teaching in the study. One suggestion to support increased ESD instruction was a need for a more flexible curriculum that would provide an opportunity for

classroom teachers to consider current events. Again, the belief that curriculum is already overcrowded prevented learning with a sustained environmental focus for some teachers. The focus group echoed these thoughts, arguing that if ESD “is not embedded and remains peripheral it will be difficult to move education for sustainable living ahead in schools” (Babiuk & Falkenberg, 2010, p.108). Final themes that have already been highlighted in mentioned studies included a lack of time, personal burnout, funding, and the problem of distinguishing curriculum subject areas and learning outcomes (Babiuk & Falkenberg, 2010).

A key recommendation raised by Babiuk and Falkenberg (2010) was directed to the Province of Manitoba. They argued that Manitoba Education should conceptualize ESD as the central educational concern for schooling in Manitoba through which all other educational issues are understood. The argument for this is that,

the multi-strand notion of sustainability to which Manitoba Education has subscribed is grounded in a holistic, systems-theoretical view of the world... Such a worldview, in turn, requires seeing any issue of human living in the light of this multi-strand notion of sustainability. Educators who share this view will, thus, need to view all issues of human living, to which all educational issues belong, in this integrated way, too. (Babiuk & Falkenberg, 2010, p.205).

Further, they pushed Manitoba to develop,

future curricula using an integrated or interdisciplinary curriculum model combined with an inquiry stance in all grades. Rather than organizing curriculum and learning outcomes in isolated subjects the curriculum should be organized around big and essential questions. The curriculum objectives should be focused on deep and enduring

understanding of those bigger and essential issues and their interconnectedness. The notion of ecological literacy should play a central role in the integrated and interdisciplinary curriculum (Babiuk & Falkenberg, 2010, p.210).

In sum then, the findings of Babiuk and Falkenberg (2010) only serve to support the previously mentioned findings. Many of these authors consider the curriculum as a barrier to effective education for environment instruction for transforming student actions in particular.

Gaps in Literature

Blumstein and Saylan (2007) consider education for environment a ‘failure’, not just in what has been taught, but more importantly, “how environmental education curricula have been developed and evaluated” (Blumstein & Saylan, 2007, p.973). Taken as a whole, the evidence from these research studies supports that claim. There are three conclusions that can be drawn. Firstly, the siloing of subjects into separate curriculum areas prevents effective teaching for education for environment (Hart, Metz et. al., Belton, Kraljevic, Jacques, Eckton, Babiuk & Falkenberg). Secondly, many educators found that either an overcrowded curriculum, or overly restrictive curriculum creates a challenging environment for effective teaching of education for environment (Hart, Metz et. al., Jacques, Eckton, Belton, Michalos, Babiuk & Falkenberg). Thirdly, these two elements working together have not led to strong knowledge or positive behaviours for what I will call ecological literacy, let alone ecopedagogy, even in Manitoba where significant restructuring has taken place since the beginning of this century (as detailed in Chapter 1).

While these studies have shone a light on the work that needs to be done to improve education for environment, none have directly sought to critique and measure the quality of curriculum that directly informs teacher's instruction. In this Chapter studies from Babiuk and Falkenberg (2010), Eckton (2015), Kraljevic (2012), and Michalos et. al (2015) have aimed to gauge student knowledge or actions as a result of the current curriculum, and likewise studies from Babiuk and Falkenberg (2010) Belton (2013), Jacques (2012) have attempted to see what schools and classrooms are doing in an effort to expand education for environment. From my literature review, no studies to date have critically analyzed the Manitoba High School curriculum to measure against such a benchmark as the Earth Charter (2000b).

In addition, other than Babiuk and Falkenberg (2010) who surveyed a wide range of stakeholders, the studies in Manitoba often focused primarily on attitudes of students and teachers in Grade 10 science and occasionally social studies, as they are regarded as courses that could contain a substantial amount of environmental science content. But in four years of high school, these two one-credit courses representing 220 hours of learning that *may* focus on education for environment cannot be expected to accurately account for the 3300 hours of learning that a student requires to acquire the 30 credit hours necessary for graduation. I emphasize this because many of the researchers of the aforementioned studies suggest that education for environment needs to permeate multiple subject areas over the course of multiple years to impact student knowledge, attitudes and actions. While I am not discrediting these studies, by looking at exclusive pockets such as Senior Years Science or Social Studies, or only detailing the experiences of pro-environmental educators they offer too narrow a perspective of what should be a K-12 learning process. What learning outcomes do subjects such as English

Language Arts, Grade 9 Science or Grade 12 Social Studies offer in terms of environmental content? At present we do not have a clear picture. The research on environmentally minded educators or implementation of school wide policies are isolated examples. Every public school in the Province of Manitoba is beholden to the mandated curriculum, meaning that ensuring their strength in fostering ecopedagogy in classrooms is vital. What I will contribute to the conversation on education for environment in Manitoba is a critical content analysis of 29 Senior Years courses to provide a better idea of the extent to which education for environment is present. I will now turn to a detailed explanation of how I will undertake this investigation.

Chapter 3: Methodology

It seems to me a lamentable contradiction to engage in progressive, revolutionary discourse and have a practice which negates life. A practice which pollutes the sea, the water, the fields, devastates the forests, destroys the trees, threatens the birds and animals, does violence to the mountains, the cities, to our cultural and historical memories.

Paulo Freire, *Pedagogy of Indignation*, p.46-47, 2004.

In Chapter Two I took the evidence of ecological crisis, and explored in greater depth the connections between education and the environment, through the perspectives of organizations, ecologists and educators in the field. The chapter closed with a review of studies conducted in the area of education for environment. Chapter Three will detail how I will use content analysis to evaluate the extent to which the Manitoba Senior Years curriculum learning outcomes support, ignore or contradict the principles of the Earth Charter (2000b), and consequently education for environment in Manitoba. I will begin by detailing what manifest and latent content analysis are, before exploring how a critical perspective will be drawn into my research framework. Strengths and challenges of the methodology will be evaluated, and how I will overcome the challenges. A case study from Jóhannesson et. al. (2011) will be shared as an example of how document analysis has been previously applied to investigations on curriculum. I will follow this with my methodological approach to conducting the research, and how data will be collected. I have included a brief section outlining my positionality as a researcher in an effort to make the reader

aware of my background and any considerations of bias. The chapter will end with assumptions and limitations of the study.

Content Analysis

Description.

Content analysis (CA) is a research method that aims to draw inferences from text so a researcher may gain knowledge and understanding of a topic or phenomenon (Hsieh & Shannon, 2005). To reach this goal CA undertakes “careful, detailed, systematic examination of a particular body of material in an effort to identify patterns, themes, biases, and meanings” (Berg & Lune, 2012, p.349). According to Weber (1990), inferences drawn by a researcher using CA are about the sender or senders of the message, the message itself, or the audience of the message (Weber, 1990). The raw material for CA can be any form of document or communication medium (Gall, Borg & Gall, 1996), including verbal, print, electronic, and obtained from narrative responses, surveys, interviews, focus groups, observations, or print media such as articles, books or manuals (Hsieh & Shannon, 2005). Flick (2002) claims that content analysis is one of the ‘classical procedures’ for analyzing textual material (Flick, 2002). For a study that aims to critically analyze a selection of Manitoba curriculum documents, content analysis is a methodological approach that fits the material under consideration and its interpretation.

Types of content analysis include conventional, directed and summative (Hsieh & Shannon, 2005). Manifest and latent content analysis are forms of summative content analysis. Manifest content analysis is a quantitative research method that employs coding to the content under analysis, and aims through coding to count the appearance of words, phrases or sentences

for example. In manifest content analysis the researcher makes “replicable and valid inferences by applying empirical and statistical methods to textual material” (Catanzaro in Woods & Catanzaro, 1988, p.437). Weber (1990) states that often when analyzing a large amount of content “there is too much information in texts... their richness and detail preclude analysis without some form of data reduction” (Weber, 1990, p.41), meaning a researcher will need to reduce the material into a manageable quantity. Coding, where a word, word sense, sentence, passage, or whole text within a document is searched and then catalogued, aids in this process. Roessger (2017) used manifest content analysis to determine the frequency of ‘meaning making language’ in scholarly journals, practitioner journals, and federal policy writings. Manifest content analysis assumes that a high frequency of particular word count means that the author values said word and its meaning. Based on the content analysis from this study Roessger concluded that there was a discrepancy in language between the journals, and that since 2003 practitioner and policy meaning making language had been used between 3.7 and 4.5 less than in academic journals (Roessger, 2017).

Latent content analysis is a qualitative research method in which the researcher “views each passage of the textual material within the context of the entire text” (Catanzaro in Woods & Catanzaro, 1988, p.437). Latent content analysis seeks to understand not what word or words are included in a text, but what is implicit or explicit in their use. For example, Lindqvist, Kostenius, Gard and Rutberg (2015) used latent content analysis on interviews with ten parents involved in an experiment to raise levels of physical activity with their children. The authors categorized parent responses into three sub-themes, which then informed one main theme in parent responses (Lindqvist, Kostenius, Gard & Rutberg, 2015). As in this example, when the

number of researchers involved can support the effective analysis of a quantity of text, then latent content analysis alone is an appropriate methodological approach.

Berg and Lune (2012) distinguish manifest content as “comparable to the surface structure present in the message, and latent content is the deep structural meaning conveyed by the message” (Berg & Lune, 2012, p.355). Importantly for my study, often researchers will combine manifest and latent content analysis approaches. Researchers including Weber (1990), Babbie (2001), and Berg and Lune (2012) state that the best approach is for a researcher to use both quantitative (manifest) and qualitative (latent) when conducting content analysis studies.

I will use manifest and latent content analysis simultaneously, whereby once a code has been located (manifest), I make a determination on whether the code is being used in the context that the Earth Charter (2000b) suggests (latent) before tabulating. I believe that by using this approach I will be able to produce a robust yet manageable conclusion from my research.

Incorporation of ‘critical’ component.

Krippendorff and Bock (2004) addresses the use of a critical approach to content analysis, highlighting a number of studies with descriptive aims. These studies from a variety of subjects have examined prejudicial perspectives on AIDS in medical writing (Treichler, 1988), portrayals of African-Americans in children’s literature (Pescosolido, Grauerholz & Milkie, 1996), and biases against the presence of women in literature (Gerbner & Marvanyi, 1977). Using a critical lens informed by ecopedagogy to analyze the use of key words from the Earth Charter (2000b), I aim to highlight deficiencies in meeting the need to educate Manitoban youth on environmental issues highlight weaknesses within the Manitoba curriculum. Critical questions to ask in the qualitative stage of the quantitative results include: What does the

appearance and use of particular words in the curriculum evidence of ‘safe’ words that do not question the status quo of contemporary industrial society or capitalism? Whose voices and perspectives are privileged or absent? What extent are these words used to encourage action or praxis? To what extent is the presence or absence of these words part of the null or hidden curriculum? Sapsford and Jupp (2011) argue that emancipation is a key component of critical research. It is not enough to merely highlight oppression, but steps must be taken to overthrow it (Jupp, 2011, p.9). My research study will therefore aim to draw attention to deficiencies in curricula for addressing the environmental crisis, and to the extent possible for a graduate thesis, encourage and advocate educators, administrators and curriculum developers to move beyond consciousness to praxis in tackling this issue.

‘Critical reflexivity’ is a term used by Strega and Brown (2015) to frame research with a critical lens. They argue that critical reflexivity requires the researcher to acknowledge their politics and ideologies and that as a result the researcher “intentionally, consciously and repeatedly bring awareness to the question of what influences our perceptions, conceptions, and responses throughout the research process” (Strega & Brown, 2015, p.8). Through a careful and conscious effort to work with critical reflexivity, as Strega and Brown outline, I aim to “uncover and challenge the power relations embedded in research, and to uncover and challenge hegemonic assumptions about the nature of the world, the self, and research, [such as] white supremacy, capitalism and patriarchy” (p.8). Curriculum represents a government view on knowledge to an extent that I view it as an effort to promote a system of hegemonic knowledge, attitudes and behaviours.

If, (as previously mentioned by Kress in Caldas-Coulthard & Coulthard, 2003), the curriculum is a text created as a design for a future society, including knowledge, skills, meanings and value in the present which will be telling in the lives in the future (Kress in Caldas-Coulthard & Coulthard, 2003, p.16), then analysis is vitally important to understand whether the Manitoba Senior Years curricula is geared toward cultivating ecopedagogy in Manitoban youth. If key elements of the Earth Charter (2000b), considered a vital source for moving towards a sustainable future are ignored, or even contradicted, then this will have ramifications for the environment and well-being of our population in the province. Decisions on what content to include in a curriculum document are political. It is my view that the decision by the Province of Manitoba to exclude education for environment completely, limit to tokenism, or outright contradict best practices as outlined by the Earth Charter (2000b), then this is done with intent. This research study aims to uncover and present the extent to which Manitoba curricula are providing documentation that requires the practice of knowledge, attitudes and actions towards education for environment.

Steps.

Weber (1990) claims that there is no simple right way to do content analysis, rather “investigators must judge what methods are most appropriate for their substantive problems” (Weber, 1990, p.13). Within the literature on content analysis, a variety of approaches were offered. What follows are quantitative and qualitative processes that seek to meet the goals of cutting down the sample content, and allow for focused critical analysis of the resulting content.

Manifest content analysis.

1, Establish a sample of documents.

Twenty-nine Manitoba curriculum documents from the senior years have been selected as the sample for this study. These documents cover all subject areas that students are likely to meet content connected to education for environment between grades 9 and 12. Details on the selection process for curriculum document can be found later in this chapter.

2, Develop a list of codes.

The following 51 codes (including synonyms number 100) in Table 3 were pulled from the Earth Charter (2000b). These were key words that conveyed the ‘who’ and ‘what’ is required to address attitudes, knowledge and actions according to the Earth Charter (2000b). The specific code from the Earth Charter (2000b) is bolded, with synonyms following.

Table 3

Codes and Code Synonyms for Content Analysis

<i>Earth</i> / land	<i>Care</i> / compassion / love
<i>Humanity</i>	<i>Society</i>
<i>World</i> / planet	<i>Democratic</i> / democracy
<i>Diversity</i>	<i>Values</i>
<i>Culture</i>	<i>Living</i>
<i>Life</i>	<i>Political</i> / politics / government /
<i>Humane</i> / human development	governance

<p><i>Nature / natural</i></p> <p><i>Human rights / rights</i></p> <p><i>Justice / injustice / economic justice / social justice</i></p> <p><i>Peace / tolerance / non-violence (nonviolence)</i></p> <p><i>Community / communities</i></p> <p><i>Resilience</i></p> <p><i>Well-being / health</i></p> <p><i>Biosphere</i></p> <p><i>Ecology / ecological systems / ecological responsibility</i></p> <p><i>Plant / plants / forests / vegetable</i></p> <p><i>Animals / organisms</i></p> <p><i>Soil</i></p> <p><i>Water</i></p> <p><i>Clean air</i></p> <p><i>Global</i></p> <p><i>Environment / environmental</i></p> <p><i>Consumption / consume</i></p> <p><i>Poverty</i></p> <p><i>Population</i></p>	<p><i>Spiritual</i></p> <p><i>Responsibility</i></p> <p><i>Inclusive / inclusivity</i></p> <p><i>Local / locally</i></p> <p><i>Solidarity / kinship / cooperation</i></p> <p><i>Ethics / ethical / unethical</i></p> <p><i>Sustainable / sustainability / sustain / sustainable development</i></p> <p><i>Dignity / respect</i></p> <p><i>Action / praxis</i></p> <p><i>Conservation / restoration / rehabilitation / renewal</i></p> <p><i>Wild</i></p> <p><i>Endangered species / species</i></p> <p><i>Minerals / fossil fuels</i></p> <p><i>Precautionary principle</i></p> <p><i>Pollution / toxic</i></p> <p><i>Reduce / reuse / recycle</i></p> <p><i>Energy</i></p> <p><i>Public</i></p> <p><i>Equality / equity</i></p> <p><i>Gender</i></p>
---	---

<i>Security</i>	
-----------------	--

3, Analyze the documents for frequency of codes.

Each curriculum document can be found in PDF format on the Government of Manitoba's Department of Education website. Using the 'Search' tool on the PDF document, each code will be entered and the document scanned. For every instance of the code within the curriculum document, the sentence (or paragraph if context is required to explain the reason for the code being used) will be analyzed. While a number of software programs exist for content analysis, none that I consulted were able to meet the needs of this specific study. Therefore, the manifest content analysis section for my study will be completed through manual character recognition (MCR). This is a process where I will view each code within context, individually evaluating its contextual application to the Earth Charter (2000b), before tabulating.

Latent content analysis.

1, Critically analyze each use of key word within the curriculum documents against its use within the Earth Charter (2000b).

Each use of the code within the curriculum documents will be critically analyzed to determine whether its use is echoed within the Earth Charter (2000b). This evaluation will be tabulated alongside the sentence (or paragraph) taken from the curriculum documents.

2, Total the frequency of codes and their use within a passage or sentence.

Once all curriculum documents have been scanned for codes and tabulated, a numeric value to represent the number of coded words, and their respective frequency of use will be totalled.

3, Make inferences from analysis.

A summary of findings will be undertaken. Questions to consider include:

- Which codes appeared frequently within the curriculum documents?
- What does the presence of codes within the curriculum documents say about the values and goals of the curriculum documents?
- Do any patterns emerge from the results?
- Which codes were not present within the curriculum documents?
- What does the absence of codes within the curriculum documents say about the values and goals of the curriculum documents?
- Were any codes used to contradict their use in the Earth Charter (2000b)? If so, how?
- Were any codes used *vaguely*? Could their vague use allow an educator to repurpose them to align with the Earth Charter (2000b)?
- What changes to curriculum documents should be advocated to align more closely with the Earth Charter (2000b)?
- What voices are included in the Manitoba curriculum? What voices are excluded?
- Does the Manitoba curriculum promote or challenge a continuation of the status quo in terms of attitudes, knowledge and actions for education for environment?
- Overall, to what extent does the Manitoba Senior Years curriculum support, ignore or contradict the need to cultivate attitudes, knowledge and actions to support environmentalism in Manitoban youth?

Validity

There are benefits and challenges to using content analysis. Advantages include being able to conduct a research study directly on texts used in human communications (Weber, 1990; Babbie, 2001). As the documents under study are texts, the research study is stable and can be reproducible (Weber, 1990). CA as a methodology is also unobtrusive, and as a result the act of measurement will not confound the data (Weber, 1990; Berg & Lune, 2012; Babbie, 2001). CA is a cost effective method of research (Babbie, 2001; Berg & Lune, 2012), and there is a safety in being able to repeat or redo the content analysis if errors in either the quantitative or qualitative stages are found (Babbie, 2001).

In the manifest content analysis section of research, challenges may be faced with the validity of the coding process. In my study a series of key words or indicators of education for environment are drawn from the Earth Charter (2000b), and the frequency of use in curriculum documents is catalogued. Despite efforts made to develop a robust list of words and potential synonyms, I acknowledge that the potential for words to slip through the quantitative research section of my study is a possibility. A second concern is that the words used for coding measure what I intend them to measure, and that the homographs (words with more than one meaning) are not misrepresented in their meaning (Babbie, 2001; Weber, 1990; Gall, Borg, & Gall, 1996). By undertaking latent content analysis after manifest content analysis, I will be able to take note of the misrepresentation, and make a judgment on including or excluding their use. As stated, CA allows for repetition of a procedure if necessary.

Weber (1990) reminds us that as fraught the process of coding can be, too much information exists in texts, and some form of data reduction is necessary. The key he argues “is choosing a strategy for information loss that yields a substantially interesting and theoretically useful generalization, which reducing the amount of information analyzed and reported by the researcher” (Weber, 1990, p.41). Flick (2002) adds that “above all, and contrary to other approaches, the goal here is to reduce the material” (Flick, 2002, p.190). For the effective determination of education for environment content, my sample of 29 curriculum documents are included as part of this study, within the universe of all Manitoba curriculum learning documents. For the completion of this research study and the effective drawing of conclusions, it is beyond the constraints to not include some form of selectivity. A final disadvantage of content analysis includes locating the necessary documents for analysis (Berg & Lune, 2012), but as the Government of Manitoba provides open public access to all curriculum documents on their website means that this is not a concern.

Document Selection

Senior Years curriculum in Manitoba covers Grade 9, 10, 11 and 12. As of 2018 those grade levels include 50 courses and associated curricula, 13 of which are compulsory courses for graduation, meaning that a student must pass 17 additional elective courses. Undertaking an analysis of all these curriculum documents for courses available to Manitoba high school students is both unnecessary and beyond the limitations of this study. It is important to undertake a thoughtful document selection process to determine which curriculum documents

that will be included in this research study. The table below details courses excluded for study along with a explanatory rationale.

Table 4

Courses Excluded from Content Analysis and Rationale for Exclusion

Course	Rationale for Exclusion
<ul style="list-style-type: none"> ● Grade 9 Mathematics ● Grade 10, 11, and 12 Essential Mathematics ● Grade 10 Applied / Pre-Calculus Mathematics ● Grade 11 and 12 Applied Mathematics ● Grade 11 and 12 Pre-Calculus 	<ul style="list-style-type: none"> ● Low likelihood of explicit learning outcomes connected to education for environment.
<ul style="list-style-type: none"> ● Grade 9, 10, 11, and 12 Career Development 	<ul style="list-style-type: none"> ● Low likelihood of explicit learning outcomes connected to education for environment.
<ul style="list-style-type: none"> ● Grade 9, 10, 11, and 12 Arts (Including Visual, Music, Drama, Dance) 	<ul style="list-style-type: none"> ● Low likelihood of explicit learning outcomes connected to education for environment.

<ul style="list-style-type: none"> ● Grade 12 Psychology 	<ul style="list-style-type: none"> ● Low likelihood of explicit learning outcomes connected to education for environment.
<ul style="list-style-type: none"> ● Grade 9, 10, 11, and 12 Technology Education (Including Grade 9 Business Innovations; Grade 10 Personal Finance, Entrepreneurship, Creative Promotions; Grade 11 Accounting Essentials, Venture Development, Retailing Perspectives, Business Communication; and, Grade 12 Accounting Systems, Economic Principles, Business Management, Marketing and Digital Commerce, Applied Business Technologies, and Topics and Trends in Business) 	<ul style="list-style-type: none"> ● Low likelihood of explicit learning outcomes connected to education for environment
<ul style="list-style-type: none"> ● Grade 10, 11, and 12 Computer Science 	<ul style="list-style-type: none"> ● Low likelihood of explicit learning outcomes connected to education for environment
<ul style="list-style-type: none"> ● Grade 9, 10, 11, and 12 French ● Grade 9, 10, 11, and 12 Heritage Languages (Including Spanish, 	<ul style="list-style-type: none"> ● Low likelihood of explicit learning outcomes connected to education for environment

<p>German, Hebrew, Ukrainian, Cree, Filipino, Japanese, Mandarin (Chinese), Ojibwe, Portuguese)</p>	
<ul style="list-style-type: none"> ● Grade 10 American History ● Grade 11 Agriculture, A Cornerstone Industry ● Grade 12 Cinema as a Witness to Modern History ● Grade 12 Canadian Law ● Grade 12 Western Civilization, Historical Review of its Development ● Grade 12 World Geography, A Human Perspective 	<ul style="list-style-type: none"> ● For some, low likelihood of explicit learning outcomes connected to education for environment. ● Low availability or enrollment in course at Manitoba High Schools ● Seven Oaks School Division enrollment as a percentage of student grade population for 2017/18: <ul style="list-style-type: none"> ○ Grade 10 American History (3%) ○ Grade 11 Agriculture (0%) ○ Grade 12 Western Civilization (0%) ○ Grade 12 World Geography (0%)
<ul style="list-style-type: none"> ● School Initiated Courses (SIC) ● Student Initiated Projects (SIP) 	<ul style="list-style-type: none"> ● Courses are individual and specific in nature to the student or school.

While Mathematics offers a great opportunity to integrate education for environment, the Grades 9 through 12, Essential, Applied and Pre-Calculus courses will not be included. Of the 13 courses identified by the Province of Manitoba as ‘Optional Credits’ (Government of Manitoba, n.d., d), Grades 9 through 12 Career Development, Arts (Visual, Music, Drama, Dance), Psychology, Technology Education (other than courses pertaining to Health and Nutrition), Computer Science, French and Other Languages, though certainly presenting the opportunity to cover education for environment content will be excluded owing to in my view the low likelihood of relevant outcomes, or that an educator by choice would choose to incorporate education for environment principles.

Despite a strong potential for incorporating environment for education learning outcomes, a number of Social Studies courses that may include elements that connect to education for environment will be excluded from the study. These include: Grade 10 American History, Grade 11 Agriculture, Grade 12 Cinema as a Witness to Modern History, Grade 12 Canadian Law, Grade 12 Western Civilization, and Grade 12 World Geography. There were four criteria that I used to determine exclusion. Firstly, was a common-sense approach that considered the how likely curriculum outcomes would be explicitly connected to education for environment. Using this criterion I excluded Grade 12 Cinema as a Witness to Modern World History and Grade 12 Canadian Law. Secondly, was the date of publication for the curriculum, for which I instituted a 20-year rule of exclusion. I would consider that any curriculum older than 20 years no longer be considered relevant by educators, or by the Province of Manitoba who has therefore decided not to update the document. This criterion ruled out Grade 10 American History, Grade 11 Agriculture, Grade 12 World Geography, and Grade 12 Western Civilization.

The third criterion was student enrolment in courses. Unfortunately the Government of Manitoba does not track student enrolment in courses anymore (Personal Correspondence, March 13, 2018). Instead, as a general barometer of provincial enrolment I used statistics from Seven Oaks School Division, with 4000 students currently enrolled at the senior years level. This criterion confirmed the exclusion of Grade 10 American History (3% enrolment), Grade 11 Agriculture (0% enrolment), Grade 12 Western Civilization (0% enrolment), and Grade 12 World Geography (0% enrolment). The fourth and final criterion was to exclude School Initiated Courses (SIC’s), or Student Initiated Projects (SIP’s), which though possibly addressing education for environment, are too varied in both their outcomes and enrolment across the Province of Manitoba to be included.

Which now leaves the 29 courses that will be included in my study. Detailed below in Table 5 are those courses and rationale for inclusion.

Table 5

Courses Included from Content Analysis and Rationale for Inclusion

Course	Rationale for Inclusion
<ul style="list-style-type: none"> ● Grade 9 and 10 English Language Arts ● Grade 11 and 12 English Language Arts (Comprehensive, Literary, and Transactional Focus) 	<ul style="list-style-type: none"> ● High likelihood of explicit learning outcomes connected to environment, economy, human health and well-being, and quality of life. ● Compulsory courses or high enrolment at high school level.

<ul style="list-style-type: none"> ● Grade 9, 10, 11, and 12 Physical Education/Health Education 	<ul style="list-style-type: none"> ● High likelihood of explicit learning outcomes connected to environment, economy, human health and well-being, and quality of life. ● Compulsory courses or high enrolment at high school level.
<ul style="list-style-type: none"> ● Grade 9 Home Economics ● Grade 10, 11, and 12 Food & Nutrition 	<ul style="list-style-type: none"> ● High likelihood of explicit learning outcomes connected to environment, economy, human health and well-being, and quality of life.
<ul style="list-style-type: none"> ● Grade 9, 10, 11, and 12 Family Studies 	<ul style="list-style-type: none"> ● High likelihood of explicit learning outcomes connected to environment, economy, human health and well-being, and quality of life.
<ul style="list-style-type: none"> ● Grade 9 and 10 Science ● Grade 11 and 12 Chemistry, Biology, Physics ● Grade 11 Topics in Science ● Grade 12 Interdisciplinary Topics in Science 	<ul style="list-style-type: none"> ● High likelihood of explicit learning outcomes connected to environment, economy, human health and well-being, and quality of life. ● Compulsory courses or high enrolment at high school level.

<ul style="list-style-type: none"> ● Grade 9 Social Studies (Canada in the Contemporary World) ● Grade 10 Social Studies (Geographic Issues of the 21st Century), ● Grade 11 Social Studies (History of Canada) ● Grade 12 Social Studies (Global Issues) ● Grade 12 Social Studies (Current Topics in First Nations, Metis and Inuit Studies, A Foundation for Implementation) 	<ul style="list-style-type: none"> ● High likelihood of explicit learning outcomes connected to environment, economy, human health and well-being, and quality of life. ● Compulsory courses or high enrolment at high school level. ● Curriculum published in the last 20 years.
---	--

What will be included in the study are the compulsory Grades 9 through 12 English Language Arts courses, which includes 30S and 40S Comprehensive, Focus, and Transactional options. These courses are included because of their potential for the curriculum outcomes to request students to consider concepts, ideas, attitudes and beliefs pertaining to education for environment. In the fall of 2018 the Government of Manitoba mandated a new Senior Years English Language Arts curriculum. Although only in draft form at the time of research, the document will be included in my study as both a contrast to the older English Language Arts curriculum documents, but also to provide insight as to see the direction that Manitoba Education may be taking in their curriculum reform.

Grades 9 through 12 Physical Education/Health Education, Grade 9 Home Economics and Grade 10, 11 and 12 Food and Nutrition (combined curriculum) are also included, specifically because of potential outcomes connected to concepts of ‘human health and well-being’, which along with economy and environment represent the intersecting circles of the graphic used by the Province of Manitoba to represent Education for Sustainable Development. Grade 9 and 10 Science, Grade 9 Social Studies (Canada in the Contemporary World), Grade 10 Social Studies (Geographic Issues of the 21st Century), Grade 11 Social Studies (History of Canada) are all included owing to the strong connections that Social Studies and Science have to education for environment and because they are compulsory courses for graduation. Grade 11 and 12 Chemistry, Biology and Physics, Grade 11 Topics in Science and Grade 12 Interdisciplinary Topics in Science are all included despite them not being compulsory courses, but owing to the high likelihood of education for environment outcomes. Grade 12 Social Studies courses, Current Topics in First Nations, Metis and Inuit Studies, and Global Issues, Citizenship and Sustainability will be included for the same reasons.

Case Study Example

Although using a document analysis methodology instead of content analysis, Jóhannesson et. al. (2011) sought to investigate the extent that the Icelandic curriculum contained ESD within its learning outcomes. Whereas I will use the Earth Charter (2000b), an already constructed and used checklist for measuring learning outcomes, the research group in Jóhannesson et. al. was represented by curriculum developers or curriculum researchers compiled a ‘key’ representing seven characteristics that reflected the interwoven aspects of ESD

(Jóhannesson et. al., 2011). As document analysis and content analysis align closely in their procedure and goals I see this as a worthwhile guide for my own research.

The seven components selected by the researchers included: (1) Indications of values, opinions and feelings about nature and environment; (2) Identification of knowledge contributing to a sensible use of nature; (3) Statements about welfare and public health; (4) Indications of democracy, participation and action competence; (5) Recognition of equality and multicultural issues; (6) Indications of awareness and understanding of global issues; and, (7) References to economic development and future prospects (Jóhannesson et. al., 2011). The curriculum was divided amongst the group members, who read and recorded all possible indications of ESD, comparing and sharing work amongst the group for confirmation.

Based on their analysis of the Icelandic curriculum, the group concluded that if viewed explicitly, the curriculum did not meet the benchmark they had set of an acceptable amount of ESD content. However, they also concluded that there was enough ambiguity and reflexivity in the curriculum that the curriculum could be 'changed' by interpreting it in a certain way, which of course could either be advantageous or problematic depending on the teacher interpreting the curriculum towards or away from an ESD focus (Jóhannesson et. al., 2011). This study has been useful in providing guidance for my own research, as curriculum outcomes may not be black or white, but grey areas that are communicate neither explicit nor implicit arguments for or against the Earth Charter (2000b).

Assumptions Underlying the Study

The United Nations in *Our Common Future* (1987) is clear, There is a strong scientific consensus that the global climate is changing and that human activity contributes significantly to this trend. The Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report concludes, with 95 percent certainty that the human influence on the climate system is clear and is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system... The scientific consensus about human-induced climate change is further attested to by a joint statement signed by 11 of the world's leading national science academies representing Brazil, Canada, China, France, Germany, Italy, India, Japan, Russia, the United Kingdom and the United States. Many other science bodies have issued similar statements... Several surveys of the refereed literature on climate change science have confirmed that virtually all published papers accept the scientific basis of human-induced climate change.

(United Nations, 1987).

As explained in detail in the opening pages of my study, these conclusions from 1987 have only strengthened.

My study takes as fact that climate change and ecological degradation are human led. It is assumed that education for environment and specifically ecopedagogy is an important step for increasing the knowledge, attitudes and behaviour of youth in an effort to reduce the duality between humans and the natural environment. Following this, it is understood that failure for humans to correct this duality will cause widespread permanent and irreversible damage to the

planet, which will lead to ever increasing and permanent loss of species, biodiversity and well-being for all humans. Humans as a whole will need to share resources, which has specific impact on industrialized Western societies, who as consumers of the majority of the Earth's resources (Worldwatch Institute, 2011) will need to drastically reduce their consumption.

On the whole the need to reform public education along more engaging or interactive and student led learning principles are also assumed. Central to my study is the belief that education is fundamental to reconnecting humankind in Western industrial society with nature. Within my study an improvement in attitudes, knowledge and behaviours towards reconnecting and living alongside the environment in Manitoba is a goal. My assumptions are drawn from the Brundtland Declaration in 1987 (United Nations, 1987), United Nations Decade of Sustainable Development, 2005 - 2014 (United Nations, n.d. c) and United Nations Sustainable Development Goals in 2016 (United Nations, n.d. d). Finally, it is assumed that as humans we have a vested interest in changing the course of human history for the better of the planet, and that this is possible.

Limitations

I will present five limitations for this study. Firstly, like all research, the critical content analysis in my study is interpretive (Altheide, 2000, p.290). As Bowen (2009) states, the researcher "should establish the meaning of the document and its contribution to the issues being explored" (Bowen, 2009, p.33). Likewise, Rapley (2007) advocates engaging with texts sceptically, and advises the reader that "through studying discourse you begin to see how there is not 'a truth' but rather multiple and sometimes contradictory truths or versions. Also language

does not refer to a stable reality but produces multiple possible understandings of *the real*” (Rapley, 2007, p.128). Despite using a quantitative method in my research, the process of deciding a list of codes is subjective, but I will undertake it while also maintaining that it is a fallacy to suggest that research can be attempted or shared neutrally.

A second limitation emerges by comparing Manitoba curriculum with the Earth Charter (2000b), a document that is not curriculum, or specifically designed to evaluate curriculum. Manitoba Education defines a curriculum framework as “a subject-specific document which identifies student learning outcomes for what students are expected to know and be able to do as they relate to the knowledge and skills of a particular subject area” (Government of Manitoba, n.d., d). In other words, the curriculum is a list of knowledge and skills that are recognized as essential understandings. The Earth Charter is a guide “for a sustainable way of life as a common standard by which the conduct of all individuals, organizations, businesses, governments, and transnational institutions is to be guided and assessed” (Earth Charter, 2000b). While the Manitoba curriculum documents and Earth Charter (2000b) may take different forms, their intentions are alike and fair for comparison. I do not hold the Earth Charter (2000b) as a perfect model curriculum, but along with many scholars at the fore of ecopedagogical writing do see it as a framework for working to bring ecopedagogy into schools.

A third limitation is the choice of documents included in the critical content analysis. For the purposes of this study, the curriculum selected for analysis will be limited to the 29 courses aforementioned for the outlined reasons. Students in Manitoba need to complete 30 credit hours at the Senior Level, including a minimum of 17 compulsory courses and 13 electives. My study will include the many of the compulsory courses for Senior Years in addition to a number of

optional courses. As I am selective in deciding which curriculum documents to include and exclude in this study, a conclusive statement on the Earth Charter (2000b) principles connection to all Senior Years curriculum cannot be made. However, as 29 curriculum documents will be analyzed, this will represent a not insignificant summary of education for environment content that a student would be exposed to by graduation in Manitoba.

A fourth limitation is the actual use of the curriculum. As Luke (1995) suggests, it is questionable how much attention the classroom teacher pays to curriculum. Educators might “ignore, skim, dismiss, read selectively, or might be influenced by a colleague... a highly experienced teacher might not even consult the document, or it might be contradicted by other documents” (Luke, 1995, p.29). Indeed, this is truly a major consideration that deserves further investigation. But for the purposes of my study, I will adopt the approach that Manitoba curriculum learning outcomes form the outline of what should be taught and assessed in the classroom. In addition to reading curriculum, it is beyond the scope of this research to consider the extent to which teachers are assessing for curriculum outcomes. Rather, I will take the approach that curriculum documents essentially highlight what the government values, wants taught and understood by all youth enrolled in public education.

Finally, an investigation of what role place-based, experiential, and rural education in playing a role in ecopedagogy will not be included. Despite the importance of psychological and sociological research into education and how they might have positive or negative impacts on developing improved knowledge attitudes and behaviours for ecopedagogy, my research will also restrict itself to analysis of documents. Lastly, while I value the emergence of indigenous education in recent years as an increasing presence in the Manitoba classroom, outside of the

Grade 12 Indigenous Perspectives course, a consideration of the connections between ecopedagogy and indigenous education lies outside the boundaries of this study.

While acknowledging the limitations that this study presents, I consider the premise and aims of critically analyzing curriculum documents to gauge the extent they support the environment a valuable and as of yet unexamined area in Manitoba education. There are certainly many departures and different configurations that a content analysis of curriculum in Manitoba can take. What I aim to do in this research study is undertake a manageable and meaningful investigation of Provincial curriculum, to celebrate where outcomes align with the Earth Charter (2000b) and raise awareness of deficiencies where they do not. As argued in the opening chapter of this paper, the effective construction of curriculum is the first step in generating the necessary attitudes, knowledge and action in students to move beyond conservation to restoration of the environment for the benefit of present and future generations of Manitobans.

The Researcher

With full recognition that neutrality and objectivity are not possible in research, and in accordance with the recommendations of Strega and Brown (2015) for critical reflexivity it is important that I outline my positionality: I am a white, heterosexual male of European descent. I am an immigrant, moving from the United Kingdom in the early 2000s following which I completed my high school diploma in rural Manitoba, before studying in Winnipeg completing two undergraduate degrees in Social Sciences and Education. I have grown up in a lower-middle class family on a farm, which while providing me with the opportunity to connect with the land,

I did not appreciate, nor value until my mid-twenties. I recognize my role as a settler on Treaty 1 territory and acknowledge that my role as an educator obliges me to teach through reconciliation.

As a researcher I come to this inquiry following a series of graduate courses that focused on the theme of sustainability and well-being in education. Through my coursework I have developed a better understanding of the need for education for environment, practices that research indicates are likely to enhance the chances of engaging and expanding student knowledge and interest in learning. Owing to the planetary crisis we face, I believe that education for environment should be the foundation for all learning in public education, and that teachers as revolutionaries can play an important role in shaping this future. As Joe Kincheloe argues,

in the new right-wing educational order that exists in the twenty-first century, knowledge is something that is produced far away from the school by experts in an exalted domain. This must change if a critical reform of schooling is to ever take place. Teachers must have more say, more respect in the culture of education. Teachers must join the culture of researchers if a new level of educational rigor and quality is to ever be achieved... with empowered teachers prowling the schools, things begin to change (Kincheloe, 2008, p.17-18).

Aligning myself with critical theorists in education such as Kincheloe, I am driven to see an increase in ecopedagogy and the values detailed in the Earth Charter (2000b) in Manitoban classrooms. I am undertaking this study to potentially expose barriers within our education system that are limiting this change.

At present I work at Maples Met School, a Project Based Learning School in Seven Oaks School Division. My experience at the Met School has provided me a good foundational knowledge of how Project-Based Learning operates and the benefits to students learning that this approach provides, such as greater control over the direction and products that come from their learning, being mentored in a smaller classroom, and exhibiting learning through exhibitions instead of testing. The aims of this research study are to provide a deeper understanding of Manitoba curriculum at the Senior Years. In particular I am seeking to use the learning from this graduate program and research study to enhance my understanding of the profession, pedagogy, curriculum, but more specifically to support me to increase the quantity and quality of experiences and programming that I can offer learners.

Chapter 4: Results

“Any attempt to rise to the climate challenge will be fruitless unless it is understood as part of a much broader battle of world-views, a process of rebuilding and reinventing the very idea of the collective, the communal, the commons, the civil, and the civic...

History knocked on your door, did you answer? That’s a good question for all of us”

Klein, 2014, p.460.

In Chapter 3 the methodological approach to content analysis for the 51 individual codes (including synonyms represent 100 codes total) within 29 Manitoba curriculum documents (MCD) was outlined, and in this chapter I will summarize and undertake analysis of this data. The 29 MCD are sourced from five subject areas, namely: English Language Arts (5 curriculum documents), Human Ecology (6 curriculum documents), Physical / Health Education (3 curriculum documents), Science (10 curriculum documents) and Social Studies (5 curriculum documents). The MCD span Grades 9-12 and include compulsory and non-compulsory courses.

A variety of analyses will be undertaken in this chapter. Firstly, the CO data will be cut and isolated based on MCD, subject area, grade level and individual CO across all curriculum documents. Secondly, the data will be analyzed based on these grouped sections. The analysis will highlight and discuss emergent themes and answer the driving questions of this study as outlined in Chapter Three. The data will be then cut based on which Earth Charter Principle (ECP) it falls within, with these results subsequently analyzed specifically to ascertain whether certain principles of the Earth Charter are represented or underrepresented throughout the MCD. This chapter will end with a discussion of the emergent themes from the data analysis.

Summary and Analysis of Code Occurrence

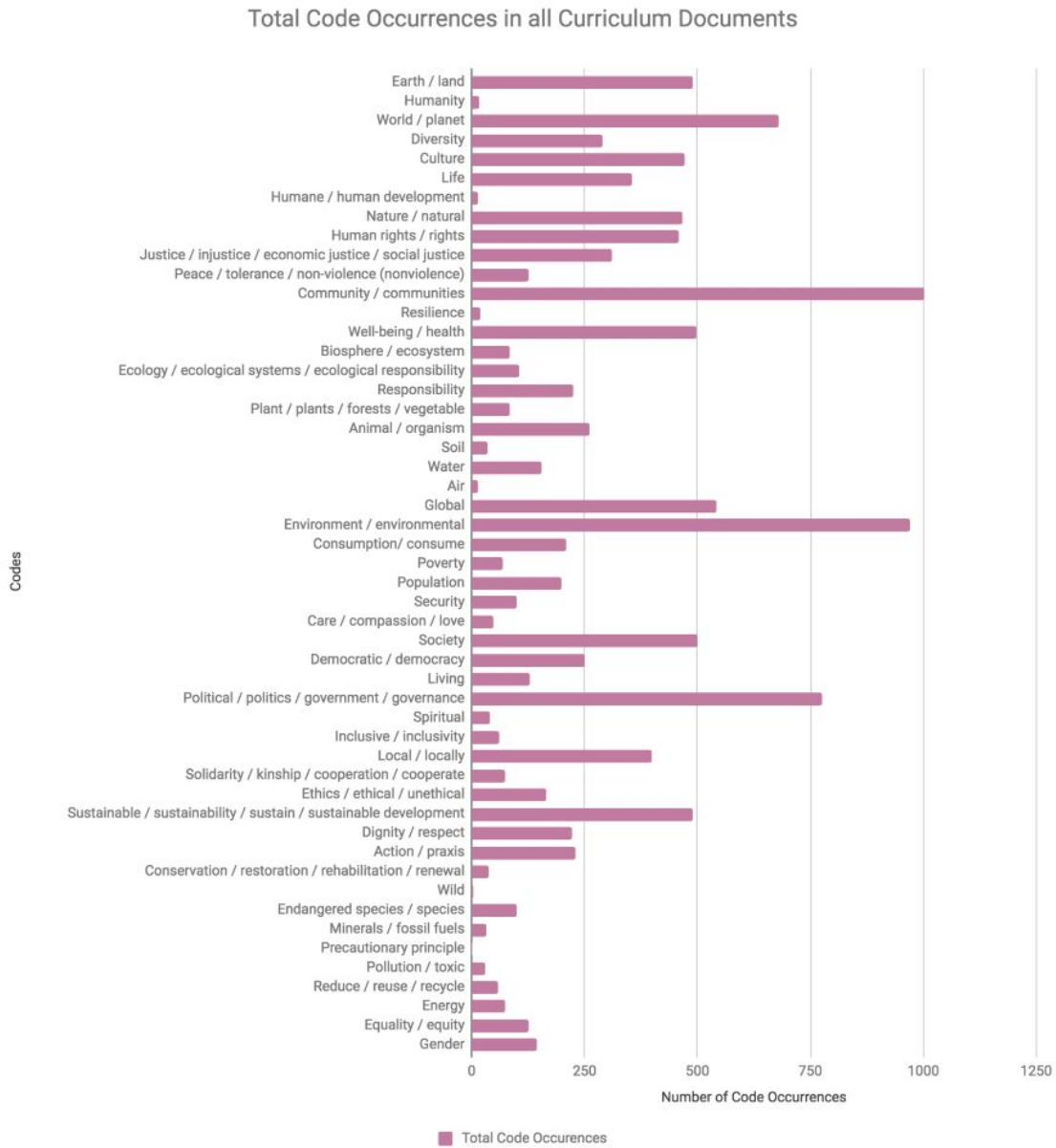
In total 12 245 codes were identified across the 29 MCD. All 51 codes or 100 codes including synonyms were present across the MCD. CO varied greatly across the MCD.

Grouping all the MCD together, at the lower end there was only one CO of *precautionary principle*, and at the higher end 1002 CO of *community / communities*. Other high frequency CO were *environment / environmental* (971), *politics / political / government / governance* (777), and *world / planet* (681). There were 12 codes present less than 50 times across the MCD, namely: *humanity* (18), *humane / human development* (14), *resilience* (20), *soil* (36), *air* (15), *care / compassion / love* (48), *spiritual* (39), *conservation / restoration / rehabilitation / renewal* (38), *wild* (5), *minerals / fossil fuels* (33), *pollution / toxic* (29), and *precautionary principle* (1).

There was also significant variance in the number of CO between MCD. Grade 12 Global Issues had the highest number of CO (2553), followed by Grade 10 Social Studies (1408) and Grade 11 Social Studies (943), and Grade 12 Current Topics in First Nations, Metis and Inuit Studies (918). There were seven MCD with less than 100 CO, namely: Grade 11-12 Environmental Design (86), Grade 12 Applied Family Studies (52), Grade 12 Interdisciplinary Topics in Science (21) as well as all five English Language Arts curriculum: Grade 9-12 Draft English Language Arts curriculum (57), Grade 9 ELA (57), Grade 10 ELA (46), Grade 11 ELA (74), Grade 12 ELA (48). I will begin analysis of findings in subject areas and curriculum documents with English Language Arts.

Figure 4

Total Code Occurrence in all Manitoba Curriculum Documents



Summary and Analysis of Code Occurrence by Curriculum Document

English language arts.

The English Language Arts curriculum offers insight into two different approaches to creating a curriculum document. The individual Grade 9, 10, 11 and 12 MCD were published between 1996 and 2000 and will gradually be phased out by a new document that encompasses all Senior Years by 2020. The new Draft ELA MCD under analysis was the May 2017 Draft, the most recent version available at the time of writing. Despite including four grade levels, at 26 pages the document itself is much shorter than the older documents, the others of which ranged between 65 and 203 pages each. Content analysis revealed the new Grade 9-12 curriculum contained 57 code occurrences, compared to the 57 (Grade 9), 46 (Grade 10), 74 (Grade 11) and 48 (Grade 12) from the older ELA MCD.

Contrasting the CO between the new Draft ELA curriculum document and the older ELA documents is starker when averaged by the number of pages in the MCD. For example, in the new Draft ELA MCD there are on average 2.28 codes per page, significantly higher than Grade 9 (0.52), Grade 10 (0.71), Grade 11, (0.45) and Grade 12 (0.24). While there are the same number of CO in the Grade 9-12 Draft curriculum as the Grade 9 curriculum, there was far greater emphasis on the codes within the document in terms of average codes per page.

The top CO for the older four ELA MCD for Grades 9-12 combined were *community / communities* (79), *culture* (34), and *society* (17). As an average, *community / communities* appeared in almost 80% of the MCD pages, with five codes total appearing in at least 10% of the

pages. Many codes were present in the 3-5 CO range, but other than *community / communities*, none appeared more than 9 times. There were 33 codes not present in any of the ELA MCD.

Figure 5

Code Occurrence in Manitoba Curriculum Documents

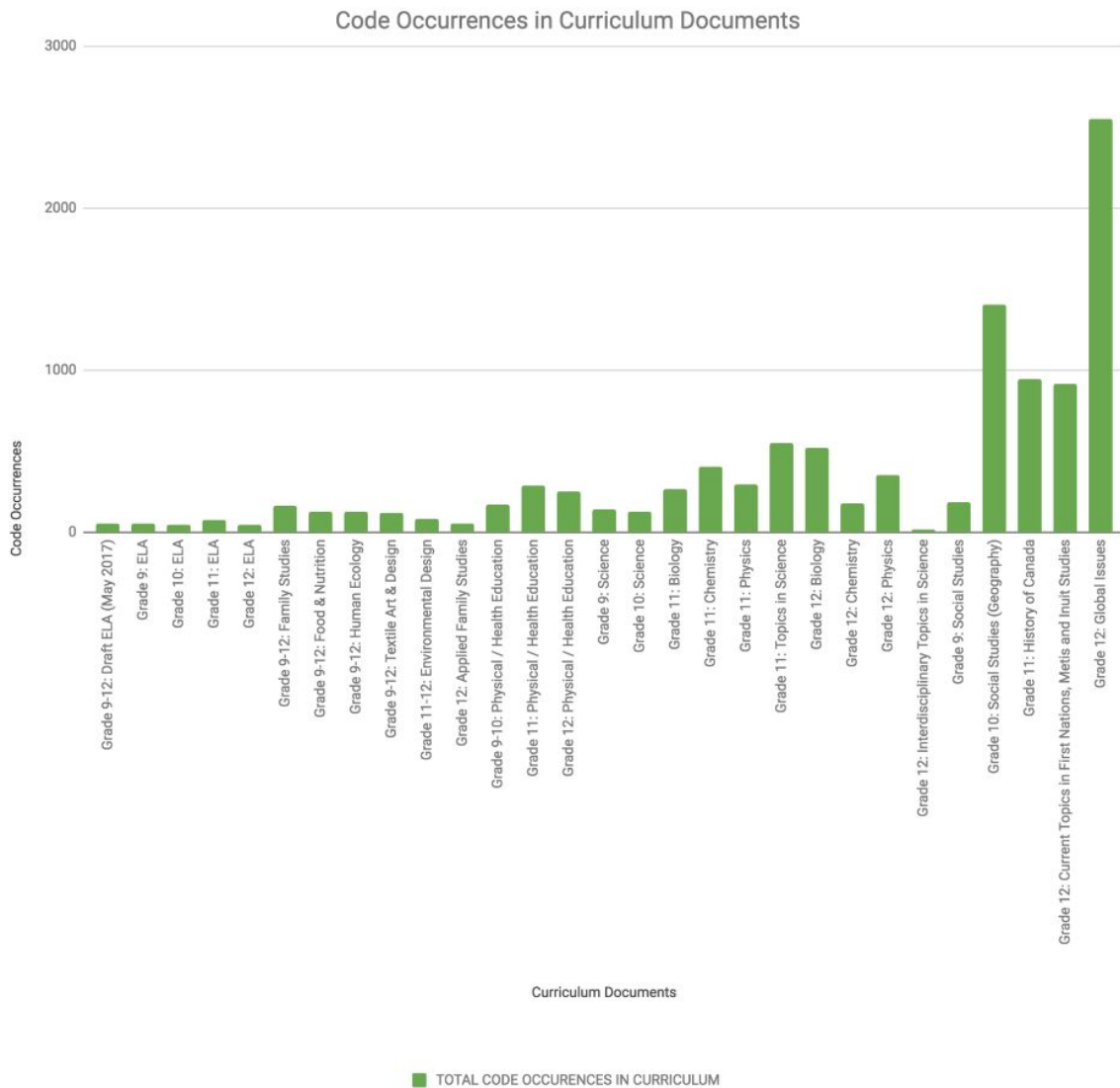
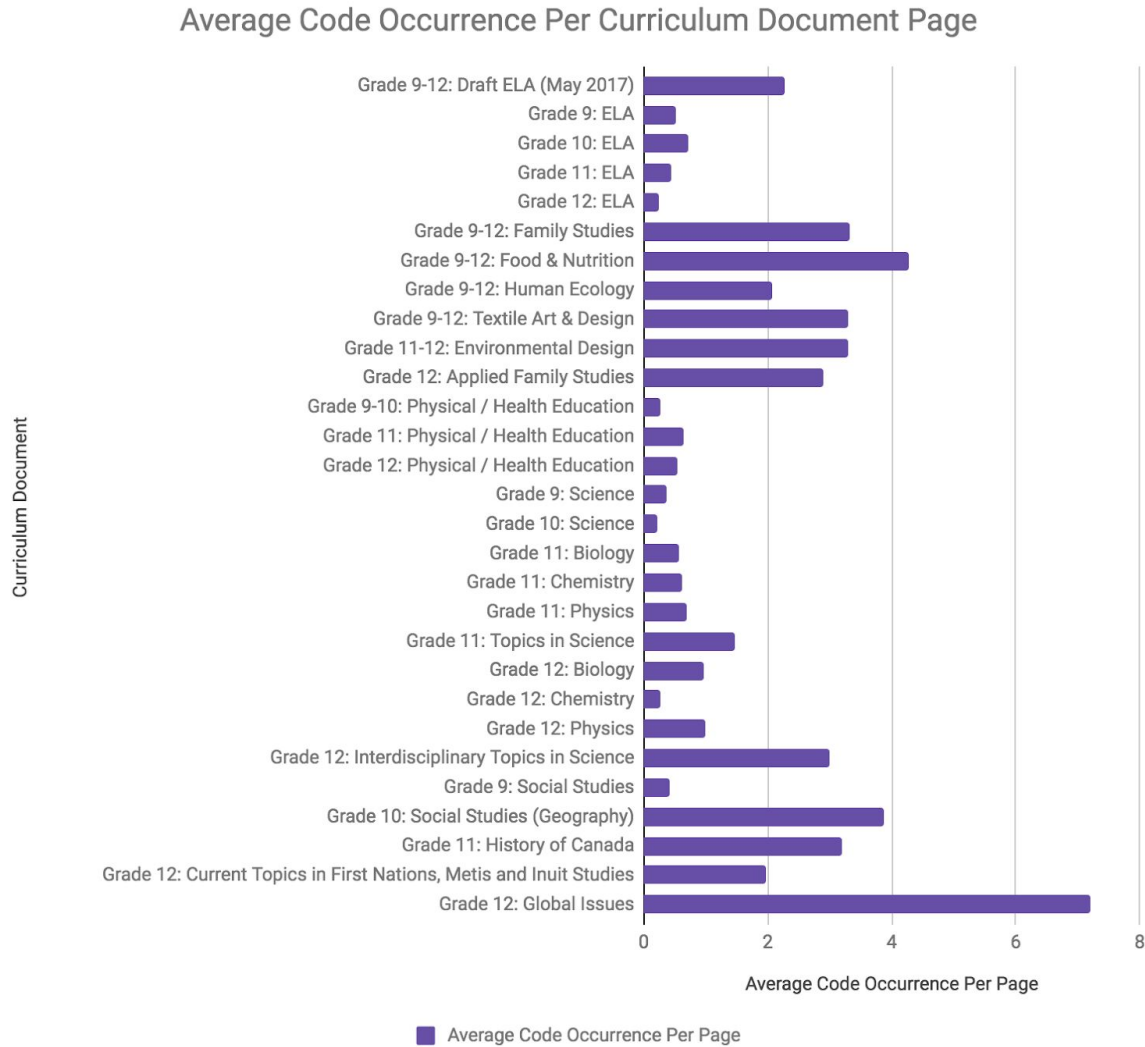


Figure 6

Average Code Occurrence per Curriculum Document Page



Codes such as *ethics / ethical / unethical* were not present in the Grade 9 or 10 MCD but appeared in the Grade 11 (4) and Grade 12 (2) documents. *Equality / equity* only appeared in the Grade 11 document and did so twice. *Humanity, human rights / rights*, and *justice / injustice* did not appear in any English Language Arts Grade level for the old MCD. For the 2017 Draft English Language Arts curriculum *community / communities* (19) and *world / planet* (7) and

environment / environmental (6) made up the top code frequencies. There are 34 codes not present in the document, with the remaining codes occurring between 1 and 5 times, but usually once or twice.

Technology education.

Technology Education includes Family Studies, Food and Nutrition, Human Ecology, Textile Art and Design, Environmental Design and Applied Family Studies. Grade 9-12 Family Studies featured the highest CO (166), followed by Grade 9-12 Human Ecology (129), Grade 9-12 Food and Nutrition (126), Textile Art and Design (119), Grade 11-12 Environmental Design (86), and Grade 12 Applied Family Studies (52). *Well-being / health* was the highest CO for Family Studies (58), Food and Nutrition (35) and Human Ecology (55), with *community / communities* the highest CO for Textile Art and Design (18), Environmental Design (16) and Applied Family Studies (11). Taken together there is common ground between the two codes of *well-being / health* and *community / communities*, and it is easy to see how the concepts would complement each other.

The codes *earth / land, biosphere / ecosystem, soil, democratic / democracy, living, conservation / restoration / rehabilitation / renewal, wild, endangered species / species, minerals / fossil fuels, precautionary principle, pollution / toxic and energy* were not present in any of the MCD for Technology Education. There were also three codes only present once: *humanity, plant / plants / forests / vegetable, and animal / organism*. This list does not have a common theme, with a diverse set of codes such as *Earth, democratic, fossil fuels* and *humanity* not necessarily fitting within a discrete category.

The Technology Education MCD are relatively short, which means that as a subject area, all of them had high average code occurrence per MCD page. This ranged from a high of 4.27 average codes per page for Grade 9-12 Food and Nutrition, to a low of 2.08 words per page for Grade 9-12 Human Ecology. Relative to other curriculum documents, all Technology Education documents had more average codes per page than any of the Science curriculum documents. There is something to be said of a precise MCD that provides space for the educator to direct learning based on student need.

Physical / health education.

In Manitoba, Physical / Health Education has a combined Grade 9 and 10 curriculum and individual MCD for Grade 11 and 12. Grade 11 had the highest number of code occurrences (289), followed by Grade 12 (252) and Grade 9 and 10 (168). When averaged by the number of pages in the MCD, as a subject area Physical / Health Education contains the fewest code occurrences with 0.28 in Grade 9 and 10, 0.65 in Grade 11 and 0.54 in Grade 12.

As with Technology Education, the highest CO's for Physical / Health Education are for *community / communities* and *well-being / health*. CO for *community / communities* increased from Grade 9 and 10 (27) to Grade 11 (49) and Grade 12 (56). *Well-being / health* is more consistent across the grades with Grade 9 and 10 (17), Grade 11 (29) and Grade 12 (20).

Another notable CO was *responsibility* which jumps from Grade 9 and 10 (8) to Grade 11 (22) and Grade 12 (35). There are 15 codes absent from the MCD in Physical / Health Education: *humanity, humane / human development, biosphere / ecosystem, ecology / ecological systems / ecological responsibility, soil, air, poverty, democratic / democracy, conservation / restoration / rehabilitation / renewal, wild, endangered species / species, minerals / fossil fuels, precautionary*

principle, reduce / reuse / recycle, and energy. These codes represent a diverse group, yet there are codes that stand out for their absence in the curriculum, notably *humanity, humane / human development, air and poverty*. These codes have strong connections to concepts of health and well-being yet were not used once in over 600 pages of MCD for Grades 9-12 Physical / Health Education.

Science.

Ten Science MCD were under analysis for this study. Only Grade 9 Science and Grade 10 Science are offered in the first two years of Senior Years, both of which are compulsory. But once students in Manitoba move into Grade 11 and 12 they can take a variety of different courses, none of which are compulsory. The Grade 9 Science MCD had 142 CO, with the Grade 10 Science 131. Averaged across the number of pages in the documents, Grade 9 Science has 0.37 codes per page, joint-second lowest of the Science MCD, along with Grade 12 Chemistry. The most common CO were *earth / land* (29), *environment / environmental* (21), *life* (14) and *society* (9). Grade 9 Science had 26 codes not present, with the remaining codes occurring between 1 and 8 times.

The Grade 10 Science MCD had an average of 0.21 codes per page - the lowest average of the 29 MCD within this study. This MCD had 631 pages, which after Grade 11 and 12 Chemistry was the highest page count for any of the 29 MCD. High page count does go some way to explain its low average, yet this still results in an average of only one code every 5 pages of MCD. The highest CO was *environment / environmental* (20), followed by *world / planet* (14), *life* (10) and *society* (10). There were 23 codes not present in this document, with all other codes remaining codes numbered less than ten CO for each. Considering that many of the

clusters in the Grade 10 Science MCD oriented around environmental science concepts, there were notable absences such as: *nature / natural, resilience, consumption / consume, ethics / ethical*, and perhaps most perplexing, *precautionary principle* and *conservation / restoration / rehabilitation / renewal*.

With compulsory Science education ending at the end of Grade 10, Grade 9 and 10 Science could be the last science-based courses a learner takes in Manitoba. Between the two courses there is much overlap in CO, with codes such as *life, environment / environmental, society, sustainable / sustainability / sustainable development* having notable CO. Other codes balance each other out between MCD, such as *earth / land, world / planet, population / politics / political / government / governance*. Yet, there are still 19 codes not present in either Grade 9 or 10 Science MCD, meaning a significant proportion of codes are left out of the MCD and potentially from a student learning experience.

CO for the Grade 11 and 12 Science courses was higher than Grade 9 and 10. Leading the way in CO was Grade 11 Topics in Science (551), followed by Grade 12 Biology (520), Grade 11 Chemistry (405), Grade 12 Physics (354), Grade 11 Physics (265), Grade 11 Biology (256), Grade 12 Chemistry (181), and Grade 12 Interdisciplinary Topics in Science (21). But again, these codes would only be present if the student opts to take the course.

The page length of the Biology, Chemistry and Physics MCD ranged between 354 on the lower end for Grade 12 Physics to 654 on the high end for Grade 11 Chemistry. The CO as averaged by page numbers shows Grade 12 Physics (1.0), Grade 12 Biology (0.96), Grade 11 Physics (0.7), Grade 11 Chemistry (0.62), Grade 11 Biology (0.57), and Grade 12 Chemistry (0.28). There is no evidence that Biology, Chemistry or Physics for Grade 11 and 12 is notably

better than another for content pertaining to our codes. There may have been high CO within the Biology, Chemistry and Physics MCD, but when averaging these CO by the page count in the MCD, it reveals relatively low CO per page.

Unlike these courses though, averaging CO by page reveals that Grade 11 Topics in Science (1.47) and Grade 12 Interdisciplinary Topics in Science (3.0) have very high CO per page, and while the latter can be explained by only being 7 pages long, Grade 11 Topics in Science presents a high CO per page average with 374 pages. Both of these courses are inquiry styled with students encouraged to take a topic or question connected to science and pursue it independently. While some content might be provided directly by a classroom teacher, there is less emphasis on direct instruction. It is interesting to note that these courses have high average CO per page compared to the other eight science MCD under investigation.

The highest CO in Science was *environment / environmental* (366), followed by *earth / land* (239), *world / planet* (224), *nature / natural* (185), *animal / organism* (176) and *sustainable / sustainability* (165). Of all *animal / organism* CO across all MCD, 176/260 are found in Science MCD. *Humanity, humane / human development, human rights / rights*, were all only present once, and *resilience, poverty, and precautionary principle* were all absent in the Science MCD.

Patterns emerged from the CO in Science MCD. Big concepts such as *earth / land* (239), *world / planet* (224), *life* (129), *nature / natural* (185), *community / communities* (113), *environment / environmental* (366), and *society* (154) were all present in high CO. More specific concepts and ideas such as *biosphere / ecosystem* (47), *soil* (8), *air* (12), *population* (12), *minerals / fossil fuels* (7), *pollution / toxic* (13), *reduce / reuse / recycle* (5) on the other hand,

were all relatively underrepresented. The CO for *local / locally* ranked relatively high at 92, but when divided by the total of number of pages in the Science MCD (2863), this only equates to a CO on 3.2% of pages. Often in the Science MCD larger concepts would be introduced with teachers prompted to connect them to local concepts, which could explain this codes low CO.

Social studies.

The last subject area, Social Studies, included five MCD in our study: Grade 9 Social Studies, Grade 10 Geographic Issues of the 21st Century, Grade 11 History of Canada, Grade 12 Current Topics in First Nations, Metis and Inuit Studies (CTFNMIS), and Grade 12 Global Issues, Citizenship and Sustainability. Grade 12 Global Issues had by far the highest CO of any MCD studied (2553) and highest average CO per page (7.21). The CO total was over 1000 more than the closest second ranking Grade 10 Geographic Issues (1408) and had almost three words per page more than the second ranking average CO per page of Grade 9-12 Food and Nutrition.

Two of the remaining three Social Studies courses, Grade 11 History of Canada and Grade 12 CTFNMIS also had high CO, the former with 943 and the latter with 918 CO. When averaged for page numbers, Grade 11 History of Canada had 3.21 CO per page, and Grade 12 CTFNMIS 1.96. However, Grade 9 Social Studies did not fit the trend of the other four courses in Social Studies. This MCD recorded only 189 CO, and averaged for 0.43 CO per page, both of which were close to a quarter of Grade 12 CTFNMIS. More on the underperforming Grade 9 and 10 Social Studies later.

Codes that had high CO in Social Studies included *world / planet* (403), *culture* (344), *nature / natural* (274), *human rights / rights* (435), *justice / injustice* (288), *community / communities* (565), *global* (396), *environment / environmental* (553), *society* (293), *democratic /*

democracy (243), *political / politics / government / governance* (710), *local / locally* (248), and *sustainable / sustainability* (276). Low CO for Social Studies MCD included *air* (3) and *wild* (3). There were other notable CO that might have been expected in higher numbers. There was only one CO for *resilience*, also ranking low were *humane / human development* (9), *air* (3), *pollution / toxic* (14), *biosphere / ecosystem* (37) and *humanity* (15). These were a significant and diverse set of concepts, that does not represent one single area of the Earth Charter. Of these, it is interesting to note the low CO of codes directly pertaining to human action such as *humanity*, *human development*, *resilience* and *precautionary principle*.

Social Studies courses only represented 5/29 MCD, yet CO across Social Studies MCD reveal the significant contribution for these courses total CO towards all 29 MCD studied. For example, in the five Social Studies MCD there were 710 CO of *political / politics / government / governance*, of a total 777 for that code in all 29 MCD. As well, 565/1002 CO of *community / communities*, 553/971 CO of *environment / environmental*, 296/490 CO of *sustainable / sustainability*, and 177/289 CO for *diversity*. The bulk of CO for *human rights / rights and justice / injustice* (435/458), *peace / tolerance / love* (113/126), *democratic / democracy* (243/250), *equality / equity* (107/126), and *humanity* (15/18) also came from Social Studies MCD. The only CO of *precautionary principle* was in Grade 12 Global Issues. 149/229 CO for *action / praxis* were in Social Studies MCD, indicating that students were encouraged through their learning to apply theory, either through community action projects or otherwise. Unlike other subject areas, there were no codes absent across the Social Studies MCD.

What these findings suggest is that a high proportion of the total CO across all MCD, and CO underserved by other MCD are present in the Social Studies MCD. Indeed, many of these

CO were in one course, Grade 12 Global Issues, of which 42.5% of the total CO in Social Studies MCD and 8.7% of all CO in the 29 MCD were located. As with the Grade 11 Topics in Science and Grade 12 Interdisciplinary Topics in Science, Grade 12 Global Issues was designed to be an inquiry course where students investigate issues for which they are passionate. All three of these inquiry-based courses ranked high on average codes per page.

Summary and Analysis of Code Occurrence by Grade

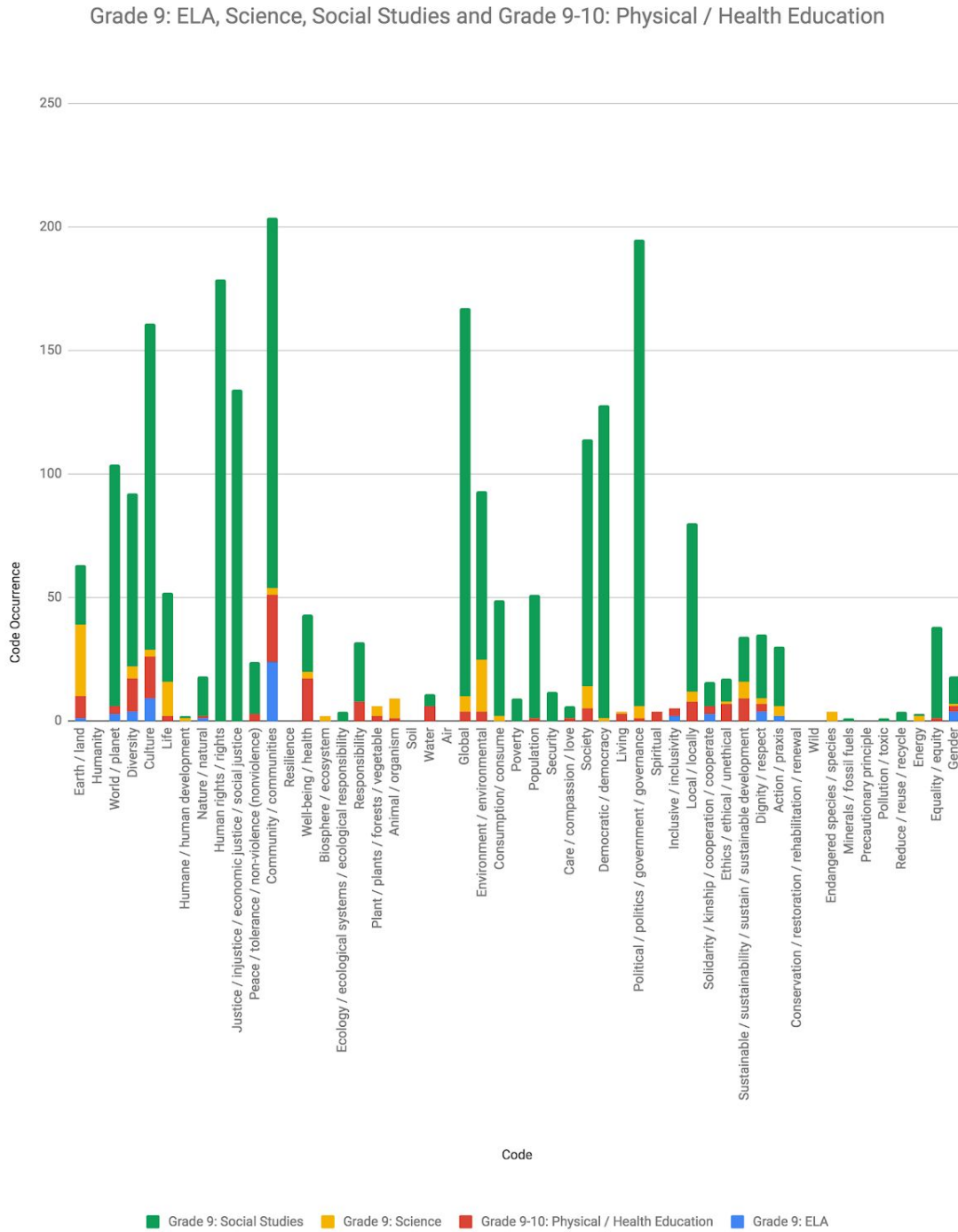
Grade 9.

Cutting the CO data by Grade reveals the weight Social Studies played in total CO. For the purposes of isolating student experiences per Grade, in Figure 7 I have taken the compulsory courses offered to students for Grade 9 within the universe of 29 MCD, leaving Grade 9 ELA, Science, Social Studies and Physical / Health Education. Figure 7, shows that for most codes in this Grade 9 selection, Social Studies MCD host a significant share of the CO. Only *earth / land* has a higher number of CO from Grade 9 Science than Grade 9 Social Studies, with all other high CO deriving most of their CO from Social Studies. The code *community / communities* had 204 CO, with *political / politics / government / governance, human rights / rights, global* and *culture* with over 150 CO, and *democracy / democratic, justice / injustice, society and world / planet* registering over 100 CO.

In total, there were 2258 codes present in the compulsory courses for Grade 9. Within this count, many including *humanity, resilience, soil, air, conservation / restoration / rehabilitation / renewal, wild,* and *precautionary principle* registered zero CO. Other low CO included *humane / human development (2), biosphere / ecosystem (2), ecology / ecological*

Figure 7

Grade 9 Code Occurrence by Course



system / ecological responsibility (4), *care / compassion / love* (6), *living* (4), *spiritual* (4), *inclusive / inclusivity* (5), *endangered species / species* (4), *minerals / fossil fuels* (1), *pollution / toxic* (10), *reduce / reuse / recycle* (4), and *energy* (3). These codes are again from a diverse group of concepts, but many connect to either ecoliteracy, pollution, or well-being.

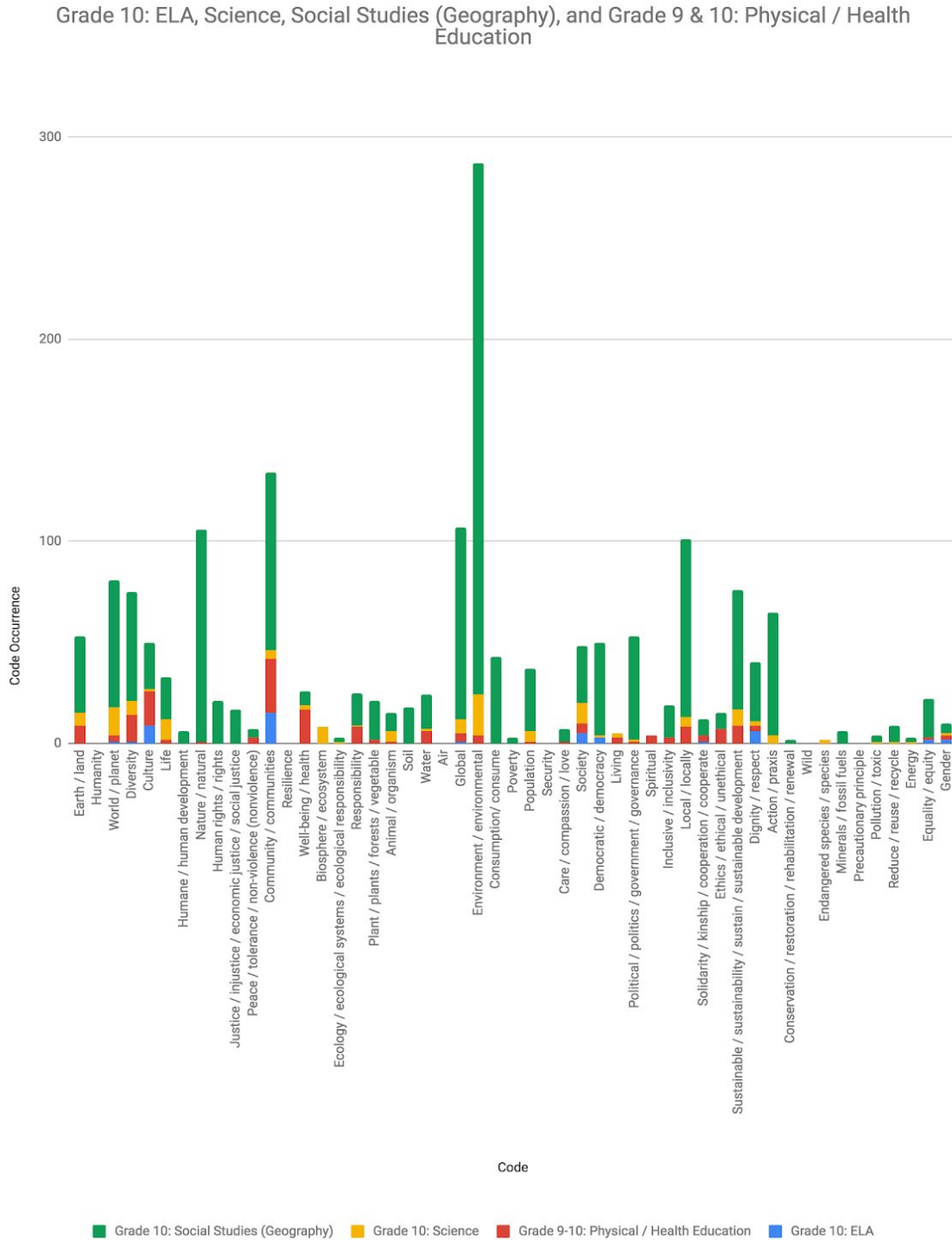
Grade 10.

From Figure 8 it is clear there is a familiar pattern for CO in Social Studies for the Grade 10 year, with codes in that subject area representing a strong majority of the total CO. Notable CO for Grade 10 include *environment / environmental* (287), *community / communities* (134), *global* (107), *nature / natural* (106) and *local / locally* (101) all appearing over 100 times. Yet, despite sampling the same number of courses for both Grade 9 and Grade 10 (English Language Arts, Physical / Health Education, Science and Social Studies), the total CO for these four Grade 10 courses only totaled 1753 – over 500 CO less than Grade 9.

As with Grade 9 there were multiple codes with zero CO in Grade 10. Six codes are absent, namely: *humanity*, *resilience*, *air*, *security*, *wild*, and *precautionary principle* – many of which were also absent in Grade 9. Other low-ranking codes include: *humane / human development* (6), *ecology / ecological systems / ecological responsibility* (3), *poverty* (3), *living* (5), *spiritual* (4), *conservation / restoration / rehabilitation / renewal* (2), *endangered species / species* (2), *pollution / toxic* (4), and *energy* (3). The main reason that there are significantly less CO in Grade 10, is that other than the code *environment / environmental* there are not the high number of CO for the top-ranking codes as was the case in Grade 9. In addition, when considering that Grade 10 Social Studies is a Geographical Issues focused course, it is somewhat

Figure 8

Grade 10 Code Occurrence by course



of a surprise to see the codes *earth / land* and *world / planet* only combine for 133 CO, as well as *soil, water, air* and *minerals / fossil fuels* for a combined 48 CO, and *energy* for just 3 CO.

What does remain a relatively strong presence in Grade 10 is the codes *sustainable / sustainability / sustainable development* (110), *action / praxis* (95), and *consumption / consume* (92). In addition, the combined codes *political / politics / government / governance* and *democratic / democracy* have a CO of 426. The high CO of these codes provide a space for a strong foundational understanding to link the underlying meaning of these codes together through instruction or project work. The high CO for *action / praxis* (65) suggests that there is encouragement in this Grade for students to start putting their knowledge into hands on projects.

Grade 11.

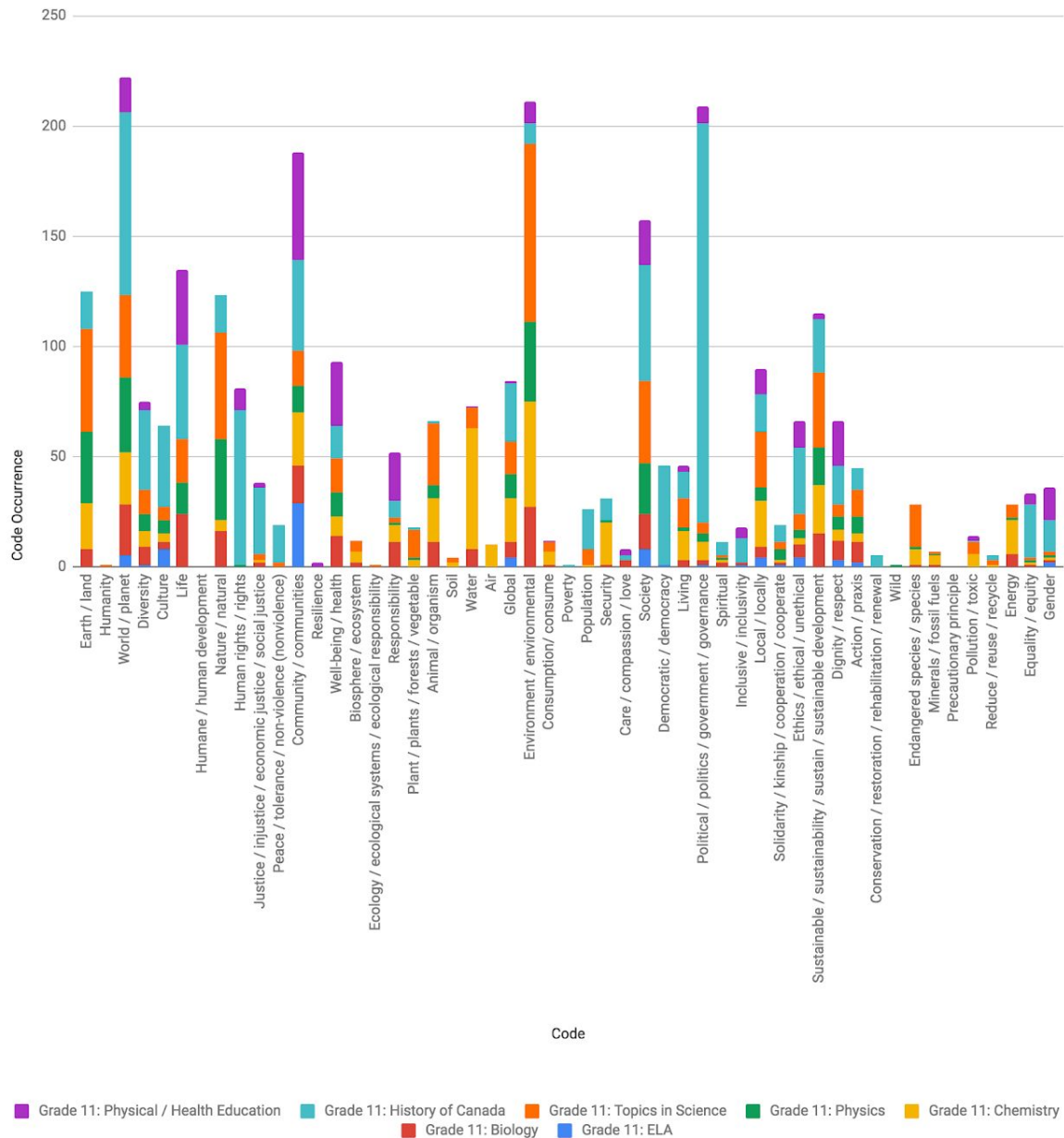
Moving into Grade 11 there were 2820 total CO for the seven courses specific to Grade 11. This total includes both the compulsory courses (Grade 11 ELA, Physical / Health Education, and History of Canada) and non-compulsory courses (Grade 11 Biology, Chemistry, Physics and Topics in Science). Averaged across the six courses, there are 470 CO, an average of about 50 CO more per course than Grade 9 and Grade 10. Whereas with Grade 9, 10 and 12 the CO were strongly supported by Social Studies curriculum, Figure 9 shows that in Grade 11 the CO are more diversely spread across courses. The three Grade 11 compulsory courses (ELA, Physical / Health Education and History of Canada) contributed 636 CO to the 2820 total CO for the Grade, which equates to 22.6% of the total CO for Grade 11.

There were nine codes with CO over 100. Notable high CO in Grade 11 for the following codes: *world / planet* (222), *environment / environmental* (211), *political / politics / government / governance* (209), *community / communities* (188), and *society* (157). Low CO

Figure 9

Grade 11 Code Occurrence by course

Grade 11: ELA, Grade 11: Biology, Grade 11: ELA, Chemistry, Biology, Physics, Topics in Science, History of Canada and Physical / Health Education



included *humanity* (1), *resilience* (2), *ecology / ecological* (1), *poverty* (1), and *wild* (1). Two codes were not present in any of the selected Grade 11 courses, *humane / human development* and *precautionary principle*, which was consistent with their low CO in other Grade levels. Considering that four of the seven courses in this Grade sample were Science based, it was surprising to see *ecology / ecological* with so few CO. Nevertheless, there was a diverse spread of high CO for the Grade 11 level.

Grade 12.

Grade 12 revealed 4847 CO for 8 courses, two of which are compulsory (Grade 12 ELA, and Physical / Health Education), with the remaining six courses non-compulsory (Grade 12 Biology, Chemistry, Physics, Interdisciplinary Topics in Science, Current Topics in First Nations, Metis and Inuit Studies, and Global Issues). Grade 12 has by far the highest total CO for the four Senior Years Grades, and with an average CO of 605.88 per MCD - 135.88 more CO per Grade 11 MCD.

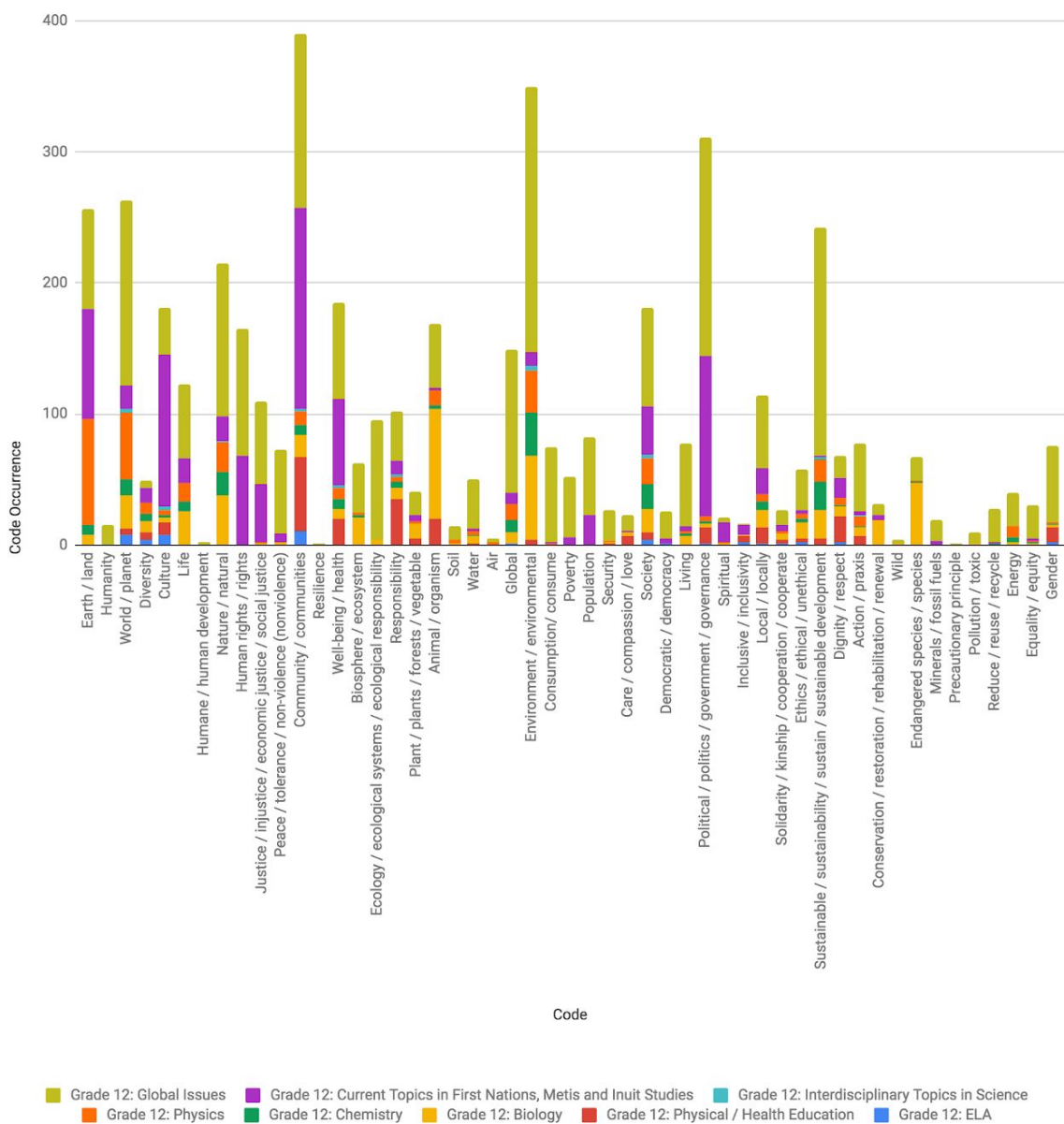
With a contribution of 52.7% of the total CO for Grade 12, Figure 10 illustrates the huge impact that Global Issues has on the high CO for Grade 12. This is followed by Grade 12 Current Issues in First Nations, Metis and Inuit Studies, which provided 918 CO, or 18.9% of the total CO for the Grade. The two compulsory courses of Grade 12 ELA and Physical / Health Education represented 25% of the Grade 12 courses in this Grade analysis, but only contributed 8.3% of the total CO to Grade 12. I draw attention to this because as ELA and Physical / Health Education are the only compulsory courses in this sample, and so a Grade 12 student may only be exposed to MCD that contain a small representative number and percentage of CO for that

year. This differs from the Grade 9, 10 and 11 year, as there are more compulsory MCD with CO that a student might be exposed to.

Figure 10

Grade 12 Code Occurrence by course

Grade 12: ELA, Physical / Health Education, Biology, Chemistry, Physics, Interdisciplinary Topics in Science, Current Topics in First Nations, Metis and Inuit Studies, and Global Issues



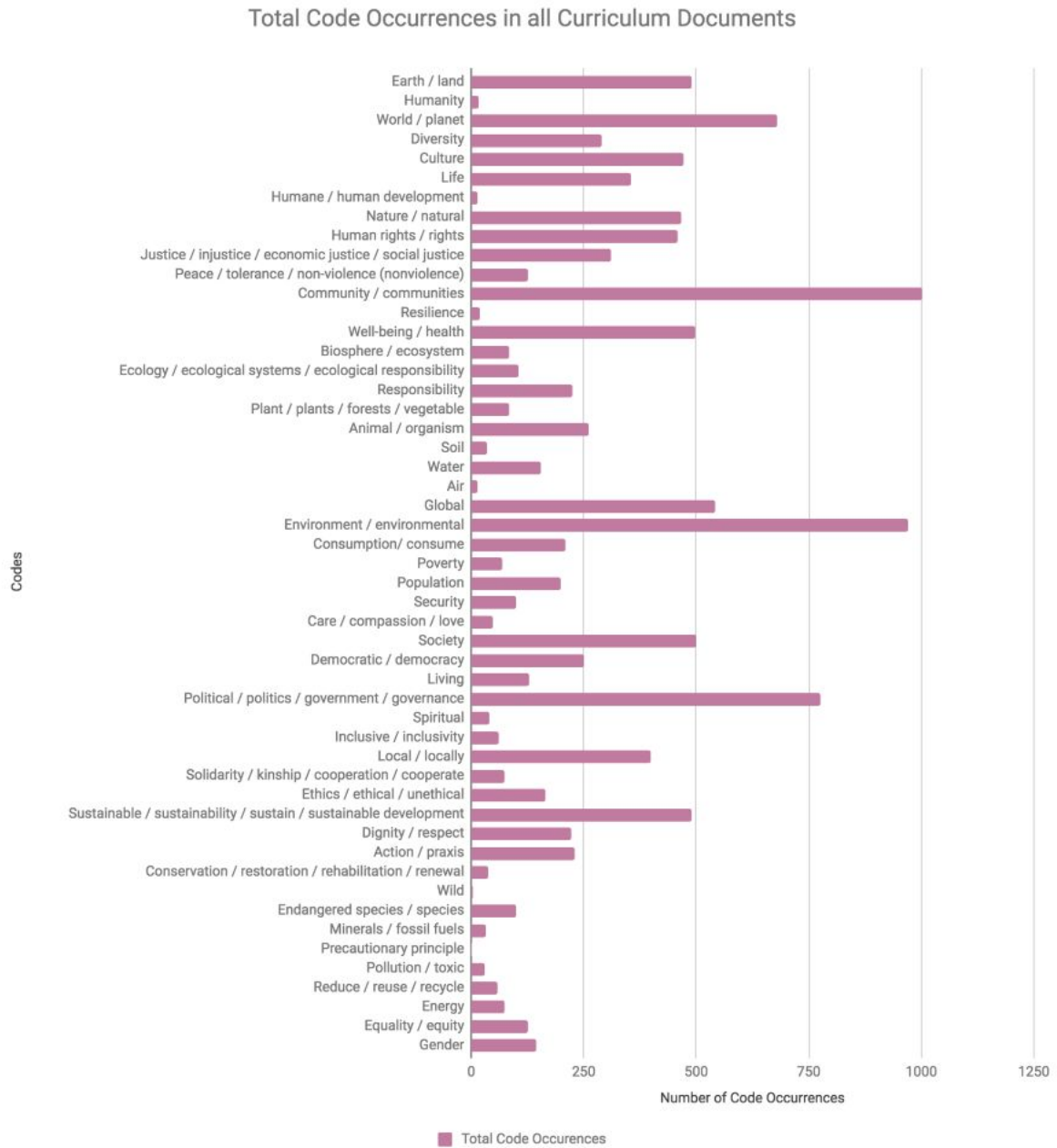
High CO for Grade 12 include the codes *community / communities* (390), *environment / environmental* (350), *political / politics / government / governance* (311), *world / planet* (263), *earth / land* (256), and *sustainable / sustainability / sustainable development* (242). There were 17 codes with a CO of over 100 representing a diverse collection of codes. Low CO included *humane / human development* (2), *resilience* (1), *wild* (4), and *precautionary principle* (1), which were also low CO in the other three Grade levels. There were no codes without representation in Grade 12, the only Grade where this happened.

Summary and Analysis of Code Occurrence by Code

Across the MCD then, there were high CO were for *community / communities* (1002), *environment / environmental* (971), *political / politics / government / governance* (777), *world / planet* (681), *global* (541), *society* (501), *well-being / health* (498), *sustainable / sustainability / sustainable development* (490), *earth / planet* (489), *culture* (471), *nature / natural* (467), *human rights / rights* (458). There is no coherent theme that unites all these codes, but some general groupings can be made. A first group would be placing *community / communities* and *society* into a general ‘population’ theme; *environment / environmental*, *sustainable / sustainability*, and *nature / natural* into an ‘environment’ theme; *world / planet*, *earth / land* into a geographical theme; and *political / politics / government / governance*, *human rights / rights* a third ‘societal’ theme; with *culture* and *health / well-being* a final fourth ‘daily life’ theme. Low CO across the MCD included *humanity* (18), *humane / human development* (14), *resilience* (20), *air* (15), *spiritual* (15), *wild* (5), and *precautionary principle* (1). The codes with low CO are too dispersed in their definitions to be drawn together coherently.

Figure 11

Total Code Occurrence in all Manitoba Curriculum Documents



General conclusions can be drawn from analyzing the codes across MCD. One is that what was often a high CO for a Grade or MCD was replicated in other Grades or MCD. For example, *community / communities* had high CO in all the Grade levels, placing 1st, 2nd or 4th in terms of CO ranking for MCD. The code was also present in all 29 MCD analyzed. The codes *dignity / respect* and *culture* ranked in the upper-middle for CO across MCD and were ever present in all but one MCD. *Well-being / health* was present in all MCD except the English Language Arts MCD where it was not present in any of the five ELA MCD. Community and health as terms are relatively vague and could be applied to any number of contexts. They are also terms that are relatively unprovocative, compared to say, fossil fuels, consumption, pollution, security, poverty and resilience – all terms that ranked very low in CO.

The highest single CO within a single MCD all came from Social Studies MCD. Highest was *environment / environmental* (263) in the Grade 10 Social Studies MCD, followed by *politics / political / government* (189) in Grade 9 Social Studies, again in Grade 11 History of Canada, *human rights / rights* (179) in Grade 9 Social Studies, *politics / political / government* (167) again in Grade 12 Global Issues, and *global* (157) in Grade 9 Social Studies. The highest CO outside of Social Studies MCD were in Science with *environment / environmental* (81) in Grade 11 Topics in Science and *earth / land* (81) in Grade 12 Physics.

With 51 codes (or 100 including synonyms) and 29 MCD, there were 1479 possible CO entries within MCD. Of this, there were 683 zero CO in the MCD, or 796 entries of one or more. This results in 42.6% rate of code absence (CoA) in the MCD, or 57.4% of CO in the MCD. Much of the CoA within MCD are attributable to English Language Arts (188 CoA), Technology Education (165 CoA) and Physical / Health Education (74 CoA). Averaged by the number of

courses within a subject, ELA had 37.6 CoA per MCD, followed by Technology Education with 27.6 CoA per MCD, and Physical / Health Education with 24.7 CoA. To provide context, Science had an average CoA of 20.6, with Social Studies MCD at 10 CoA.

Summary and Analysis of Code Occurrence by Compulsory Versus Non-Compulsory Courses

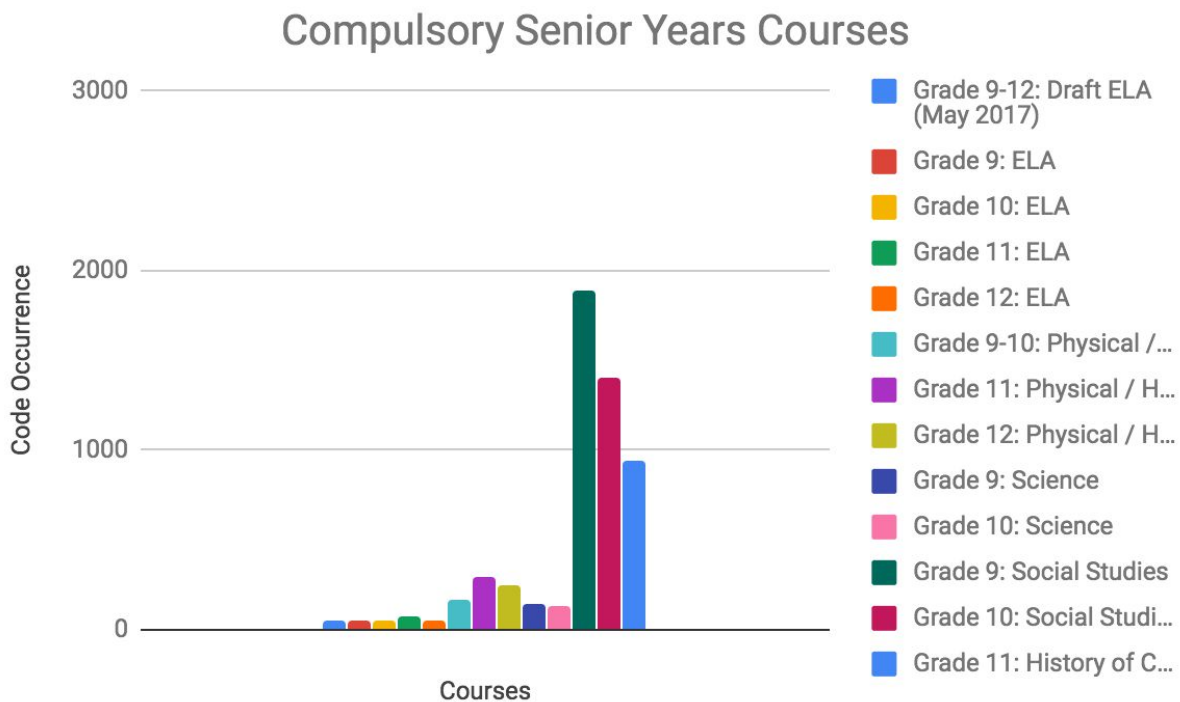
The average CO per MCD for compulsory courses was 423.53, and non-compulsory courses 421.19 CO per MCD – a remarkably close average. However, as seen in Figure 13, once we exclude Social Studies courses from analysis, then the CO for non-compulsory courses is superior to compulsory courses. Much of this has to do with the low CO in the five English Language Arts courses from Grades 9-12 and moderately high CO for non-compulsory Science courses. What this evidence suggests is that there are many MCD that have high CO that students may not be exposed to, and conversely several MCD that have low CO that Manitoba students will be exposed to. There are more non-compulsory courses than compulsory courses with high CO and more compulsory than non-compulsory courses with low CO. When students have choice in courses selection, they are reducing the likelihood that they will be exposed to MCD that have high CO.

This is particularly underscored because Grade 12 Global Issues and Grade 12 Current Topics in First Nations, Metis and Inuit Studies are not a post-secondary prerequisite for any program, whereas Grade 12 (and as a result Grade 11) Science courses are. Given the choice, a typical student who is considering taking a Science based program at post-secondary, or even wanting to keep their options open, would likely take Science courses at the Grade 11 and 12

level as opposed to non-requisite courses such as Global Issues and Current Topics. This is borne out in the data supplied by Seven Oaks School Division that reports low enrollment in both Global Issues and Current Topics in First Nations, Metis and Inuit Studies.

Figure 12

Code Occurrence in Compulsory Senior Years Courses



Students in Manitoba are provided with the opportunity in Senior Years to have more autonomy over their course selection. At first glance this is a good thing – students who have choice in which courses they enroll in are likely to be more interested and committed to studying that course material. Between Grade 8 and 9, students go from having their whole school day determined for them, and only being able to select co-curricular and extra-curricular learning

opportunities. In Grade 9 students are required to take five compulsory courses (Mathematics, English Language Arts, Physical / Health Education, Science and Social Studies), leaving space for possibly two or more non-compulsory courses. By Grade 12 the number of compulsory courses has dropped to three, while the number of courses available to them has increased. This reduces the likelihood that they will choose to enroll in a course identified with a high CO. An additional impact on low enrollment in courses with high CO is that as students move into Grade 11 and 12 they may be afforded the freedom to take ‘spares’ - as long as they end Grade 12 with 30 or more credits, unless a student is interested or motivated there is little incentive to take courses such as Global Issues or Current Topics in First Nations, Metis and Inuit Studies. Courses such as these with such rich CO appear to be a missed opportunity for addressing the Earth Charter (2000b).

Summary and Analysis of Code Occurrence by Earth Charter Principle

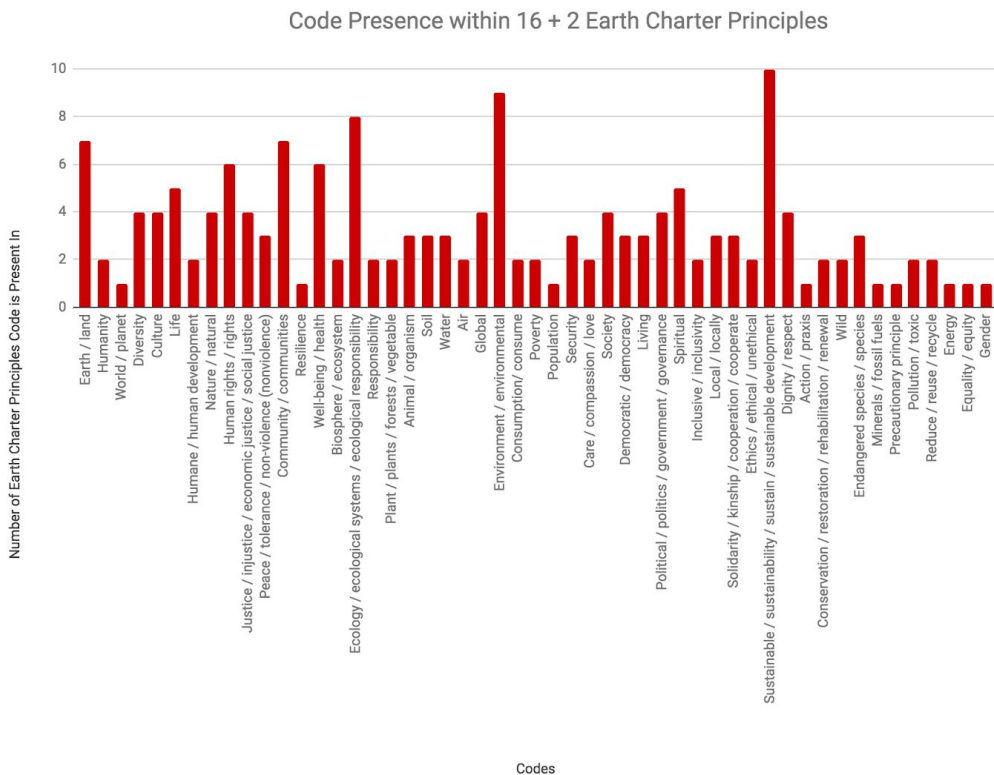
In the Earth Charter (EC) there are 16 Principles, plus a ‘Preamble’ and epilogue (titled ‘The Way Forward’), what will here on out be referred to as ECP. The purpose of Figure 13 is to demonstrate how many of the codes drawn from the EC are present in the 16 + 2 Principles. What I aim to show is that the more ECP that a code is present in, the greater the weight that code should have in our analysis.

What we can conclude from Figure 13 therefore is that greater weight should be placed on the codes *sustainable / sustainability / sustainable development* (10), *environment / environmental* (9), *ecology / ecological systems* (8), *earth / land* (7), *community / communities* (7), and *well-being / health* (6), than codes such as *world / planet* (1), *resilience* (1), *population*

(1), action / praxis (1), minerals / fossil fuels (1), precautionary principle (1), energy (1), equality / equity (1) and gender (1). This is not to argue that these codes are not important – they are still present and play a valuable role in the EC, but to argue the extent to which a code is over or under-represented in the data collected from the MCD.

Figure 13

Code Occurrence in 16 + 2 Earth Charter Principles



Beginning with the highest CO in the ECP are *sustainable / sustainability / sustainable development* which in ECP to MCD ratio is 10 / 490. Following are *environment / environmental* (9 / 971), and *ecology / ecological systems* (8 / 105). *Environment /*

environmental is certainly well represented in CO within the MCD, with the second highest CO, and so it would be fair to say this code is well-represented in MCD. For *sustainable / sustainable development* and *ecology / ecological systems* these CO are relatively under-represented in the MCD relative to their presence in the ECP.

What about codes with high CO in the MCD? *Community / communities* (7 / 1002) is slightly under represented in the ECP considering it was the highest CO in the MCD. *Politics / political / government / governance* (4 / 777) is on the other hand over-represented in MCD compared to the ECP. The same could be said for *world / planet* which had 681 CO in the MCD, but only appears in one ECP. Low CO in the MCD such as *humanity* (2 / 18), *humane / human development* (2 / 14), *soil* (3 / 36), *air* (2 / 15), *poverty* (2 / 69) *care / compassion / love* (2 / 48), *inclusive / inclusivity* (2 / 60), *cooperate / cooperation* (3 / 75), *conservation / restoration / rehabilitation / renewal* (2 / 38), and *wild* (2 / 5) were all well under-represented in MCD.

Codes that had high CO in the ECP but did not translate into equivalent high CO in the MCD include *diversity* (4 / 289), *life* (5 / 356), *justice / injustice* (4 / 311), *security* (3 / 101), *living* (3 / 129), *dignity / respect* (4 / 221), and *endangered species / species* (3 / 101). Together these under-represented codes can be grouped into two different groups, one of ‘social justice’ (diversity, justice, security, dignity / respect) and the other ‘organisms’ (life, living, species).

The most significant under-representation however was *spiritual*, which had 5 CO in the ECP, but only 39 CO in the MCD, and most of these CO in the MCD were in relation to indigenous perspectives. There are several possible reasons for the under-representation of this code. One could be that the EC is referring to a global audience that identifies more strongly with a code possessing religious connotations. Another reason could be the established secular

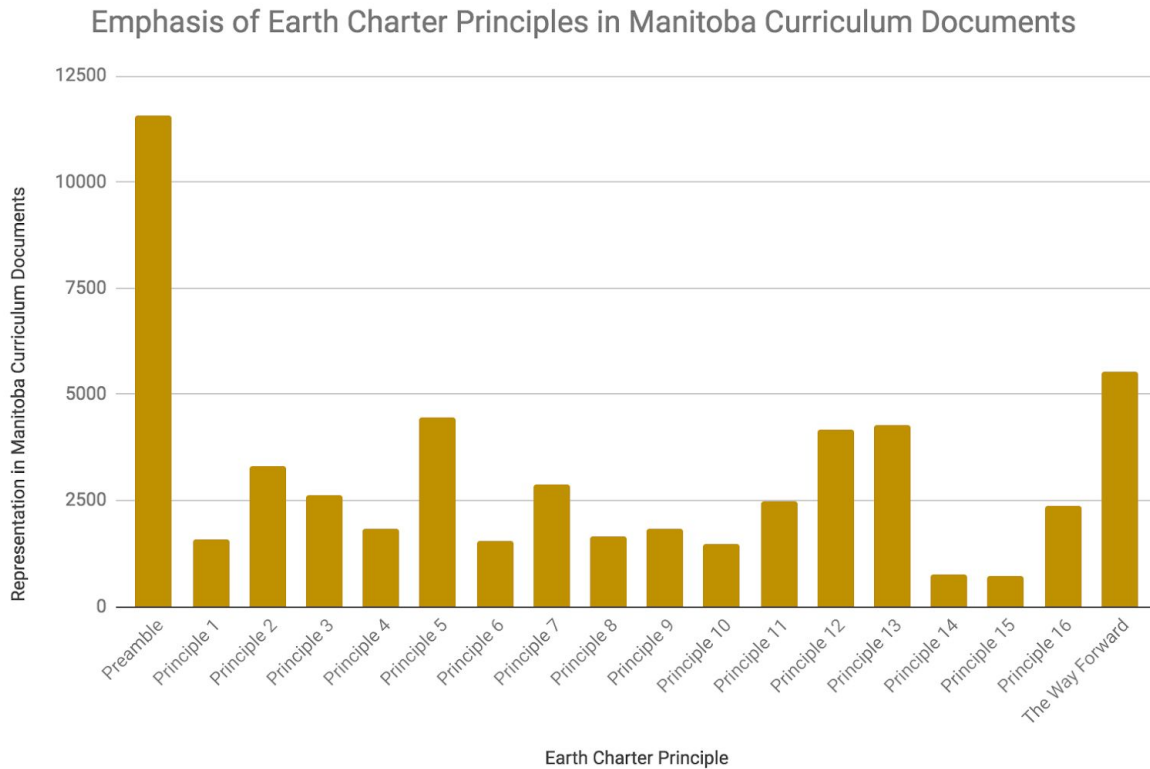
nature of education in Manitoba, and that inclusion of the word in the MCD is to make acknowledgements to the indigenous community. A further reason could be that the MCD are missing a key element in instruction by not providing the space for a spiritual element in education. It is beyond the boundaries of this study to further investigate the high CO of spiritual in the ECP and its low (and restrictive) CO in the MCD, but opens an interesting avenue for further investigation.

Figure 14 and Table 6 provide visual representation of how much each Earth Charter Principle is emphasized within the MCD. Table 6 was created by tabulating which codes were present in each of the ECP, with total CO for each code calculated to provide weighting for each ECP. For example, Principle 1 included *earth / land* (489 CO in MCD), *humanity* (18), *diversity* (289), *life* (356), *inclusive / inclusivity* (39), *ethics / ethical / unethical* (164) and *dignity / respect* (221) for a total of 1576 CO. Table 6 shows that while not the lowest represented ECP in the MCD, it is lower than the representation of Principles 2, 3, 4, 5, 7, 9, 11, 12, 13 and 16.

If we put aside the Preamble and Epilogue of the Earth Charter, well represented ECP in the MCD included Principles 5, 12, 13, 2, 7 and 3 which all had over 2500 CO in the MCD. These Principles were from all four sections of the Earth Charter, with the highest four CO coming from the four different sections of the Earth Charter. Highest representation was Principle 5 ‘Protect and restore the integrity of Earth’s ecological systems, with special concern for biological diversity and the natural processes that sustain life’, which simply had several high CO codes from the MCD including *earth / land*, *nature / natural*, *well-being / health*, *environment / environmental*, and *sustainable / sustainability*.

Figure 14

Emphasis of Earth Charter Principles in Manitoba Curriculum Documents

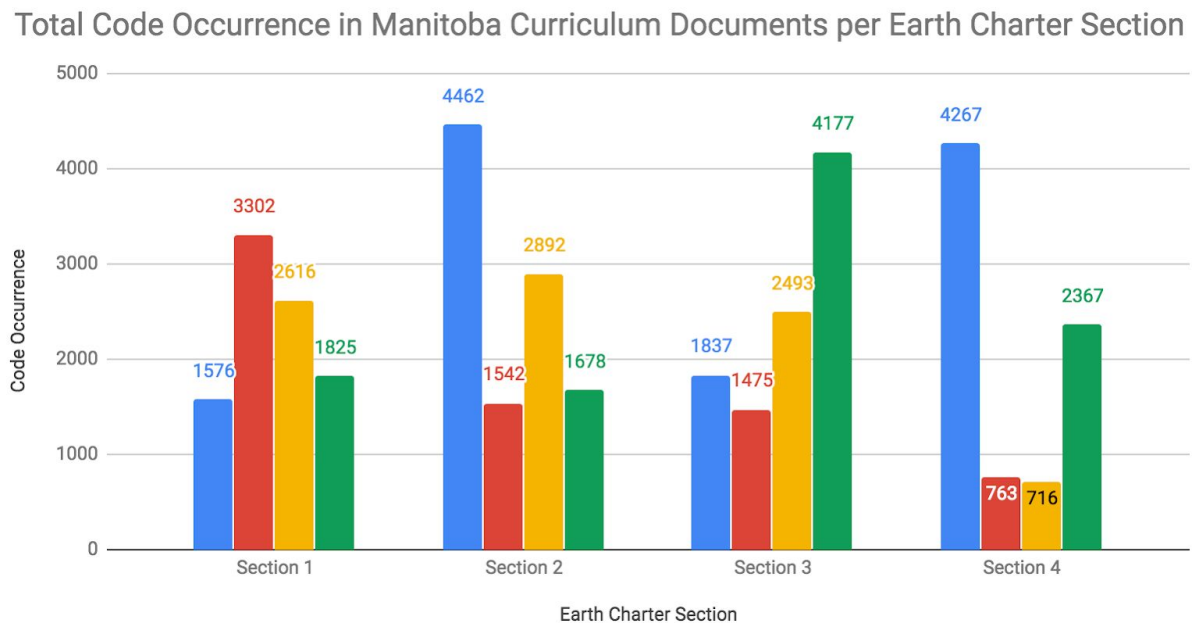


Principle 13, ‘Strengthen democratic institutions at all levels, and provide transparency and accountability in governance, inclusive participation in decision making, and access to justice’ included the codes *human rights / rights, global, environment / environmental, society, political / politics / government / governance, and local / locally*. Principle 12 ‘Uphold the right of all, without discrimination, to a natural and social environment supportive of human dignity, bodily health, and spiritual well-being, with special attention to the rights of indigenous peoples and minorities’, was like Principle 5, and included the codes *earth / land, nature / natural,*

well-being / health, environment / environmental, sustainable / sustainability, in addition to community / communities. Together these two codes present a highly diverse set of codes.

Figure 15

Total Code Occurrence in Manitoba Curriculum Documents per Earth Charter Section



At the lower end of ECP code representation in the MCD are ECP 10, 14 and 15.

Principle 10, ‘Ensure that economic activities and institutions at all levels promote human development in an equitable and sustainable manner’ comes from the ‘Social and Economic Justice’ section of the Earth Charter. Principle 10 contained only three codes *humane / human development* (14), *environment / environmental* (971) and *sustainable / sustainability* (490), but as you can see it was supported heavily by the latter two.

Interestingly, Principle 14 ‘Integrate into formal education and lifelong learning the knowledge, values, and skills needed for a sustainable way of life.’ and Principle 15 ‘Treat all living beings with respect and consideration’ both come from the ‘Peace, Nonviolence and Democracy’ section of the Earth Charter. Other than *living*, these two ECP had no overlap in codes, and in addition to *living*, Principle 15 contained the codes *animal / organism* (260), *dignity / respect* (221), *wild* (5), and *endangered species / species* (101), while Principle 14 contained *ecology / ecological* (105), *spiritual* (39) and *sustainable / sustainability* (490).

Table 6

Earth Charter Section, Earth Charter Principle and Code Occurrence

<table border="1" style="width:100%; text-align:center; font-size:small;"> <tr> <td style="background-color:#800000; color:white;">0-499</td> <td style="background-color:#c00000; color:white;">500-999</td> <td style="background-color:#e06666;">1000-1499</td> <td style="background-color:#f09999;">1500-1999</td> <td style="background-color:#f9cc99;">2000-2499</td> <td style="background-color:#e6e6fa;">2500-2999</td> <td style="background-color:#b0c4de;">3000-3499</td> <td style="background-color:#99b3ff;">3500-3999</td> <td style="background-color:#6699ff;">4000-4499</td> <td style="background-color:#0000ff; color:white;">4500-4999</td> </tr> </table>										0-499	500-999	1000-1499	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	4000-4499	4500-4999
0-499	500-999	1000-1499	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	4000-4499	4500-4999										
Earth Charter Section	Earth Charter Principle		CO in MCD																
II. Ecological Integrity	5. Protect and restore the integrity of Earth’s ecological systems, with special concern for biological diversity and the natural processes that sustain life.		4462																
IV. Democracy, Nonviolence and Peace	13. Strengthen democratic institutions at all levels, and provide transparency and accountability in governance, inclusive participation in decision making, and access to justice.		4267																
III. Social and Economic Justice	12. Uphold the right of all, without discrimination, to a natural and social environment supportive of human dignity, bodily health, and spiritual well-being, with special attention to the rights of indigenous peoples and minorities.		4177																
I. Respect and Care for the Community of Life	2. Care for the community of life with understanding, compassion, and love.		3302																

II. Ecological Integrity	7. Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being.	2892
I. Respect and Care for the Community of Life	3. Build democratic societies that are just, participatory, sustainable, and peaceful.	2616
III. Social and Economic Justice	11. Affirm gender equality and equity as prerequisites to sustainable development and ensure universal access to education, health care, and economic opportunity.	2493
IV. Democracy, Nonviolence and Peace	16. Promote a culture of tolerance, nonviolence, and peace.	2367
III. Social and Economic Justice	9. Eradicate poverty as an ethical, social, and environmental imperative	1837
I. Respect and Care for the Community of Life	4. Secure Earth's bounty and beauty for present and future generations.	1825
II. Ecological Integrity	8. Advance the study of ecological sustainability and promote the open exchange and wide application of the knowledge acquired.	1678
I. Respect and Care for the Community of Life	1. Respect Earth and life in all its diversity.	1576
II. Ecological Integrity	6. Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach.	1542
III. Social and Economic Justice	10. Ensure that economic activities and institutions at all levels promote human development in an equitable and sustainable manner	1475
IV. Democracy, Nonviolence and Peace	14. Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life.	763
IV. Democracy, Nonviolence and Peace	15. Treat all living beings with respect and consideration.	716

Emergent Themes

This study set out to uncover by the measure of the Earth Charter whether the Manitoba Senior Years curriculum was sufficiently supporting education for environment. While a few questions detailed from the outset, such as ‘Which codes do and do not appear in the Manitoba curriculum documents?’ ‘What patterns emerge from the results?’, have already been answered. Other questions, such as those that seek to critically evaluate the MCD need further consideration.

By conducting the second stage of content analysis – latent, I screened all the tabulated codes to ensure that they fit the intended meaning of the code by the authors as used in the Earth Charter (2000b). For example, the inclusion of the code *environment* was only included when it referred to the natural environment, rather than ‘learning environment’. Likewise, ‘life’ was ignored when used in the context of ‘life skills’. Through this latent content analysis process, I was able to read each of the code used in the MCD and owing to this I conclude that there were no clear instances of explicit or implicit uses of codes that contradicted their intent in the Earth Charter (2000b).

Indeed, a number aligned closely. One clear example is in the Grade 9 Social Studies MCD a section that outlined ‘Essential Elements to be Integrated into the Manitoba Curricula’, as seen in Figure 16. This explicitly outlines elements of the Earth Charter such as sustainable development, gender equity, human diversity and anti-racism. A further example from the Grade 9 curriculum was a lengthy section on what an inclusive classroom environment should look like. Eight elements, including ‘multicultural, equity-focused, and anti-bias in nature’, ‘hopeful, joyful, caring, and visionary’ and ‘supportive of students as social activists and engaged citizens’

again aligned well with the tone and intent of the Earth Charter. In a following section, the MCD explains how an educator may design classroom learning experiences that move towards a pedagogy of social justice detailing James Banks ‘Levels of Integration of Multicultural Content’.

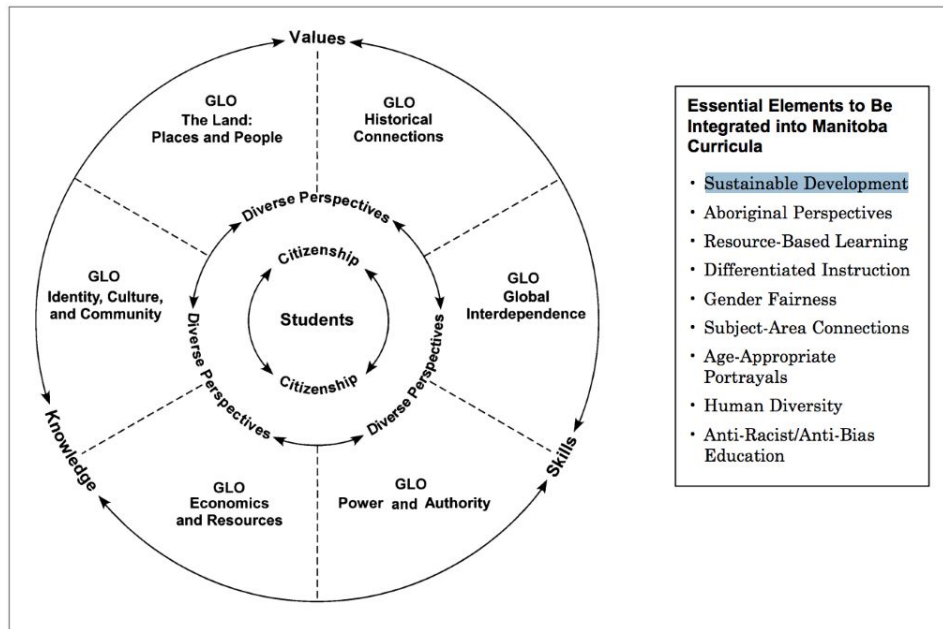


Figure 16

Essential Elements to be Integrated into the Manitoba Curricula

We wish to acknowledge Manitoba Education and Training, *Grade 11 History: A Foundation for Implementation*. Manitoba Education and Advanced Learning, 2014. Available online at https://www.edu.gov.mb.ca/k12/cur/socstud/history_gr11/document.pdf.

Despite this, themes emerging from CO separated by Grade level show the weakness of MCD at the Grade 9 and 10 level, specifically the under-representation in Science and Social Studies. At present, these Grade 9 and 10 courses represent four of the five compulsory courses

for Senior Years in Social Studies and Science and therefore it is critical that the MCD contain high CO. Grade 9 Social Studies (189) and Grade 9 Science (142) had low total CO, with Social Studies averaging 0.43 codes per page, and Science 0.37 average codes per page. Grade 10 Science (131) was even lower in CO ranking, averaging 0.21 codes per page – the lowest of any MCD in this study.

Notable codes with low or zero CO for Grade 9 Social Studies included *humanity* (0), *human development* (0), *poverty* (9), *living* (0), *political / politics / government / governance* (0), *ethics / ethical / unethical* (9), and *precautionary principle* (0). Low or absent CO from ELA are present in this list, and as with that subject area, these codes would comfortably fit within a Social Studies MCD, regardless of the identified focus for the course (whether that be ‘government’, ‘geography’ or ‘history’ for example). In Grade 9 and 10 Science several CO were low or absent, which included (in total for both Grade 9 and 10): *humanity* (0), *culture* (3), *nature / natural* (0), *justice / injustice* (0), *resilience* (0), *biosphere / ecosystem* (1), *ecology / ecological* (1), *soil* (0), *water* (1), *air* (0), *consumption* (2), *living* (3), *ethical / ethics / unethical* (1), *sustainable / sustainability* (15), *conservation / restoration / rehabilitation / renewal* (0), *wild* (0), *precautionary principle* (0), *minerals / fossil fuels* (0), *pollution / toxic* (1) and *reduce / reuse / recycle* (1). This is a long diverse list of codes that students may not be exposed to at all in their Senior Years school experience within the Science classroom. Only Grade 10 Social Studies ranked high in terms of CO (1408) and average codes per page (3.87), and while there were notable code absences in this MCD, overall there were a very high number of CO. I would deem insufficient to rely on one out of the four compulsory courses for Grade 9 and 10 in Social Studies and Science to cover content pertaining to the ECP.

Another theme that emerged was the discrepancy between code meaning in CO. Codes such as *world / planet* (681), *culture* (471), *well-being / health* (498), *environment / environmental* (971), *society* (501), *sustainable / sustainability* (490), *dignity / respect* (221), and *community / communities* (1002) appeared across the majority of MCD, and in many of the MCD registered high CO. These are a diverse list of codes, but other than *sustainable / sustainability*, none really call into question hegemonic practices of contemporary society that are harming the planet. The high ranking of what I will refer to as ‘soft’ codes are notable as a juxtaposition to ‘hard’ codes that are more critical. Hard codes such as *human rights / rights*, *justice / injustice*, *consumption / consume*, *resilience*, *minerals / fossil fuels*, *pollution / toxic* or *precautionary principle* were relatively low in CO, and not consistently present across Grade and subject areas in the MCD.

In considering whether codes were used vaguely in the MCD, for an educator to repurpose them towards (or away from) the ideals of the Earth Charter, this is a challenging question to answer. The sheer amount of content, suggested lessons and learning outcomes demand classroom teachers make decisions about what content to focus on and what to pay less attention to or discard. Ultimately, the MCD either support education for environment, or provide space for an educator to develop learning experiences that connect deeply with the Earth Charter. Certainly there is space for an educator to choose to teach away from lessons and ideas that connect to the essence of the Earth Charter (2000b) as well.

MCD that explicitly reference taking ‘action’ or ‘praxis’, both codes particularly present in the Science and Social Studies MCD are better placed to encourage learners to engage with their community in applying their learning. The codes *action* and *praxis* were not used vaguely

but made a direct call to moving beyond the classroom walls. An example of this is in the Grade 12 Interdisciplinary Topics in Science in which learning outcomes SLO B5 request students ‘Propose a course of action related to an STSE issue’, or in Grade 10 Social Studies in where students were ‘encouraged to consider how their individual actions affect the environment and to take a proactive approach regarding their personal responsibility for the well-being of the planet.’ While there is no correlation between high CO of all codes and the CO of *action / praxis*, the two MCD with the highest CO, namely Grade 10 Social Studies (1408) and Grade 12 Global Issues (2553), had by far the highest CO of *action / praxis*, with 61 and 51 CO respectively.

In response to whether the Manitoba Senior Years curriculum ‘promotes or challenges a continuation of the status quo in terms of attitudes, knowledge and actions for education for environment?’ the answer is complicated. What many of these MCD offer is either constraints or opportunities for educators to teach content related to the Earth Charter (2000b). Grade 9, 10, 11 and 12 ELA and Grade 9/10, 11 and 12 Physical / Health Education MCD offer relatively few opportunities, unless the courses can be integrated with other subjects such as Technology Education, Social Studies or Science. As previously discussed, there are ‘soft’ and ‘hard’ codes that explicitly challenge the status quo of society, but nevertheless, even the appearance of codes such as *world / planet*, *nature / natural*, and *democratic / democracy* provide spaces for these critical conversations to happen.

On the other hand there are a number of very strong MCD that align well with the ECP – in this category I would include Grade 12 Global Issues, Grade 12 Current Topics in First Nations, Metis and Inuit Studies, Grade 11 Topics in Science, and Grade 12 Interdisciplinary Topics in Science. These MCD either have high CO, high average codes per page, provide

opportunities for students to explore issues connected to the ECP, or include an action component. Courses such as Grade 11 Social Studies has a focus on History of Canada, which limits the scope of learning, but does connect to a handful of codes with very high CO. As previously stated, though Grade 10 Social Studies has one of the highest CO, this course is specifically focused on environmental science, but I would argue that it does not do enough in connecting with the ECP and could certainly be redeveloped to align better.

Some MCD, such as Grade 10 Science and Grade 11 and 12 Chemistry are over 600 pages long. It is beyond the parameters of this paper to explore the extent to which a classroom teacher reads, understands and teaches the content of these document, but I would argue that this amount of content is both unnecessary and does not contribute towards better classroom instruction. The high page count drastically dilutes the presence of codes amongst other content.

In analyzing the extent to which the MCD contains elements of ‘null’ or ‘hidden’ curriculum is again a complex question. Without doubt a number of MCD contain ‘hard’ codes that question dominant hegemonic practices such as consumerism, inequality and domination over the natural environment – views that align with the ECP. In a handful of MCD there are sections that are explicit in advocating social justice, environmental sustainability and occasionally indigenous perspectives into the curriculum. There was a lack of evidence to indicate that the MCD under analysis contained many instances of hidden curriculum, that is values, views, behaviors that emphasize competition, consumerism and private ownership than is present under the surface of the written curriculum (salehi & Mohammadkhani, 2013).

As far as ‘null curriculum’, while some MCD contained explicit references to indigenous perspectives, a number, notably Science, ELA and Physical / Health Education had omitted this,

which means that most MCD do not meet the requirements of the Truth and Reconciliation Commissions 'Calls to Action', notably Section 62, which states,

We call upon the federal, provincial, and territorial governments, in consultation and collaboration with Survivors, Aboriginal peoples, and educators, to: i. Make age-appropriate curriculum on residential schools, Treaties, and Aboriginal peoples' historical and contemporary contributions to Canada a mandatory education requirement for Kindergarten to Grade Twelve students. ii. Provide the necessary funding to post-secondary institutions to educate teachers on how to integrate Indigenous knowledge and teaching methods into classrooms.

(http://www.trc.ca/websites/trcinstitution/File/2015/Findings/Calls_to_Action_English2.pdf)

The MCD skirt around identification of individuals, groups and dominant processes that contravene the ECP by encouraging teachers to provide students with space to undertake inquiry into issues. However, what this fails to do is demand educators to provide learning experiences that make explicit the actors and processes that undermine the ECP. The increasing encroachment of corporations into the classroom with packaged lesson plans preys on educators to provide learning experiences, while almost guaranteeing that the suppliers of these materials do not come under question. The example of Shell Corporation partnering with Canadian Geographic to provide lesson plans to Senior Years teachers, is unfortunately not uncommon (Tahirali, 2012, p.8). As previously outlined, issues such as the 'precautionary principle', 'resilience', 'consumption', 'poverty' and 'pollution' are vastly under-represented in the MCD.

Collectively summarizing the Manitoba curriculum documents in their ability to effectively provide a platform for educators to provide experiences that connect to education for environment is not possible, as there is a large amount of variance between the documents. Several of them, such as Grade 12 Global Issues and Grade 12 Current Topics in First Nations, Metis and Inuit Studies contain a high number of codes. Inquiry based courses such as Grade 11 Topics in Science and Grade 12 Interdisciplinary Topics in Science contain a high number of average number of codes per page and provide space for educators to guide students towards research projects that tackle many of the issues contained within the ECP. Other MCD such as the new ELA Draft document contain a high number of average codes per page in an accessible format, that provides freedom for educators to create learning experiences that connect to issues of critical importance, such as education for environment.

Having two different MCD models to analyze made English Language Arts offered a fascinating analysis. CO in all five MCD ranged between 46 and 74 total CO and for the four older MCD 0.24 to 0.71 CO per page, however for the new Grade 9-12 ELA Draft curriculum the average CO per page was 2.28. The new Draft ELA MCD therefore shows promise of the direction that the Government of Manitoba is heading in terms of curriculum development, and present reason to be optimistic that CO average per page will increase. One of the four bands that includes 'Language as Power and Agency' which encourages educators to:

- Recognize and analyze inequities, viewpoints, and bias in texts and ideas.
- Investigate complex moral and ethical issues and conflicts.
- Contemplate the actions that can be taken, consider alternative viewpoints, and contribute other perspectives.

- Learners are recognizing that one's identities are influenced by various factors and change over time and contexts.
- Learners are understanding that texts represent and promote particular beliefs, values, and ideas.
- Learners are exploring multiple perspectives, points of view, and interpretations.
- Learners are exploring their own voices to tell and transform their own "stories" and identities and to critically view their own and others' texts.
- Learners are collaborating to investigate challenging social issues, moral dilemmas, and possibilities for social justice.

Nevertheless, with only 57 codes in the document, there is still room for improvement. Codes such as *humanity* (1), *humane / human development* (0), *justice / injustice* (2), *well-being / health* (0), *poverty* (0), *security* (0), *care / compassion / love* (0), *democratic / democracy* (0), *ethical / ethics* (1), *dignity / respect* (1), *equality / equity* (1) were all codes that would comfortably fit within an English Language Arts MCD, yet were under-represented.

Isolating the codes within the Earth Charter (2000b) provided an opportunity to identify which sections of the Earth Charter are over and under-represented in the MCD. Certain Earth Charter Principles were represented well in the MCD, such as those that focused on democracy and justice (Principle 13), human rights, well-being and access to a clean and safe environment (Principles 5 and 12). Conversely, the ECP that focused on economic activity, sustainability (Principle 10) and Principle 14 that stated 'Integrate into formal education and lifelong learning the knowledge, values, and skills needed for a sustainable way of life', were under-represented in the MCD. However, overall each of the four sections of the Earth Charter are relatively

well-balanced in the MCD. Section 1 (Principles 1-4) 'Respect and Care for the Community of Life' contains 9319 CO; Section 2 (Principles 5-8) 'Ecological Integrity' contains 10 574 CO, the highest of all Earth Charter sections; Section 3 (Principles 9-12) contains 9982 CO; and, Section 4 (Principles 13-16) contains 8113 CO. Accordingly, I would assess that the ECP as grouped by ECP are relatively evenly represented in the MCD.

Based on the frequency of codes within the Earth Charter (2000b), it was determined that the codes *sustainable / sustainability / sustainable development* (10), *environment / environmental* (9), *ecology / ecological systems* (8), *earth / land* (7), *community / communities* (7), and *well-being / health* (6) should be emphasized more in curriculum, than others. The biggest discrepancy within this group was the low ratio between CO in the EC and MCD for *spiritual*. This will be discussed further in Chapter 5.

Based on my research, an overall black or white conclusion on the ability of the MCD to support education for environment in Manitoba is not possible. Rather I accept that there are a number of things that some of the courses do well, but that to move forward in education for environment these elements need to be expanded into more courses, and that students need to be exposed to them. Chapter 5 will now consider what can be done to reach this goal.

Chapter 5: Recommendations

We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations.

The Earth Charter (2000b)

In Chapter Four, data collected from the content analysis process was outlined and cut and interrogated in a variety of ways in an effort to ascertain the extent to which the Manitoba Curriculum Documents (MCD) meet the demands of our planetary needs as measured by the Earth Charter (EC). The following themes stood out from the evidence, specifically:

- The weakness of the current English Language Arts MCD, but the hope that the Draft ELA MCD (May 2017) offers;
- The weakness of Grade 9 and 10 Science and Grade 9 Social Studies MCD;
- High code occurrence (CO) of 'soft' codes, and the low CO of 'hard' codes;
- High CO average per page of Technology Education (Family Studies, Food and Nutrition, Human Ecology, Textile Art and Design and Environmental Design courses);

- Low CO of *spirituality* in MCD contrasted to high CO in Earth Charter;
- The strength of inquiry-based courses such as Grade 12 Global Issues, Grade 11 Topics in Science and Grade 12 Interdisciplinary Topics in Science.

Based on these emergent themes, data gathered from my research and ideas pulled from the Literature Review, Chapter Five will outline nine recommendations split into two sections. The first section, ‘Recommendations from Data Analysis’ will detail recommendations 1, 2 and 3 which result directly from the data collected from this study leading to emergent themes.

Recommendations 4 through 9 act as ‘Further Recommendations’ and are based on data from the study, but also pull from research considered in the Literature Review and beyond. It should be emphasized that these six ‘Further Recommendations’ represent just the tip of the iceberg in terms of larger ideas in educational reform. The nine recommendations consider curriculum redesign, curriculum content, compulsory courses and school-day structure. Two recommendations (2 and 4) are aimed at schools, with the remainder (1, 3, 5, 6, 7, 8 and 9) directed toward the Government of Manitoba.

Recommendations from Data Analysis

Recommendation 1: When undertaking curriculum reform, the Government of Manitoba should create space for a discussion of and application of spirituality within the Manitoba curriculum documents.

Educational philosopher Nel Noddings (in Coulter, Wiens and Fenstermacher, 2008) argues that there is a place for spirituality in our classrooms today. She shares that one of the multiple definitions of spirituality is ‘everyday spirituality’, “a feeling or response to certain

features of everyday life [that] can contribute significantly to spiritual life and happiness.” Many writers, Noddings continues,

have described the rising feeling of spirit felt on watching a beautiful sunrise and the thrill of excitement induced by a stormy, restless ocean... [it] may occur as we notice a particular pattern of light or as we uncover seedlings in the spring garden... or as we look at a star-filled sky (Noddings in Coulter, Wiens and Fenstermacher, 2008, p.186-187).

If we peek into a Senior Years English Language Arts or possibly a Health Education classroom, we might expect to see educators inviting students to speak about how a text or experience makes them feel emotionally. But otherwise, the curriculum acts as a series of rational learning outcomes stripped of the opportunity to explore the wonder and awe that the universe might provoke in us. There is no requirement or space provided for learners to develop the spiritual connection to the natural world, unless an educator takes it upon themselves to provide an experience that might awaken such feelings. We are not required to ask students to consider the feeling of community, of the experience.

When I talk about spirituality, I am conflating it with emotion, because I see the essence of both these terms can be used interchangeably. The term spirituality is loaded with religious undertones in Canada, particularly in our secular schools. However, when an event from the natural world triggers an emotional response that leads a learner to develop a connection to that experience without being about to rationally articulate why, this could be considered a spiritual experience as suggested by Noddings.

In *Switch* (2010) Chip and Dan Heath outline a strategy for motivating people to change their behavior. Essential to convincing others is to appeal to their *emotional* and *rational* side.

Chip and Dan Heath state that each individual has an emotional elephant side and a rational rider side. Their guide includes three steps: directing the rider (rational), motivating the elephant (emotion), and shaping the path. In education this might look like learning about germination (rational), while planting and watching a garden grow (emotional) or walking the Mantario Trail (rational) and spending the night under the stars learning about how learners are sleeping on the oldest rock in the world and how it got there (emotional), but then directing these experiences into demonstrating understanding. The rational and emotional components provide curiosity, an openness to experience and the knowledge, before a pathway is created for the student to go further or demonstrate understanding. The emotional component of this strategy might be the invocation of a spiritual experience, the resulting sensation might be the same.

In Chapter One I referred to the work of Descartes, who argued for a Cartesian dualism between mind and body, or a separation between the rational and emotional/spiritual. Orr (1994) is another voice to counter this position stating that there is no way to separate feeling from knowledge, object from subject, “there is no good reason to separate mind or body from its ecological and emotional context... Science without passion and love can give us no reason to appreciate the sunset, nor can it give us any purely objective reason to value life. These must come from something deeper” (p.31-32). Orr is arguing in the same vein as Noddings and the Heath’s that an emotional or spiritual connection adds to the learning process.

The Manitoba curriculum documents are heavy on rational material - there are many facts and opportunities to learning basic fundamental details about the world. I would argue that there is a deficiency of emotion and spirit in the documents to balance this out. When we apply the principles of *Switch* to education for the environment, essentially what we are aiming to achieve

is to change the behaviors of citizens in Manitoba towards demonstrating knowledge, attitudes and actions conducive to a positive relationship with the planet and life on it. This is the reason for the Earth Charter (2000b), the opening lines reading, “we stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise” (Earth Charter, 2000b). What the Earth Charter is seeking to do is direct the path for citizens.

Louv (2008) connects the benefits of an emotional/spiritual connection that actually being in nature can provide youth. He points to research on the positive impacts nature that stem back to the early 1970s. Researchers then found that “subjects reported experiencing a sense of peace and an ability to think more clearly; they also reported that just being in nature was more restorative than the physically challenging activities, such as rock climbing, for which such programs are mainly known” (p.103). So not only does developing a natural connection to the environment increase the chances of us respecting and living in harmony with the biosphere, but it is good for our well-being.

The Earth Charter (2000b) recognizes the value in spirituality and in particular its importance in creating bonds between humans and other humans, and natural events, objects or experiences. In the document, *spiritual* is used frequently - five times across the Earth Charter Principles. Yet the word is only used 39 times in the Manitoba curriculum documents, mostly in reference to indigenous perspectives (as if indigenous lives are the only ones that spirituality might refer to or find value in). The code *spirituality* has the lowest Earth Charter Principle Code Occurrence to Manitoba curriculum document ratio in this study by far. Noddings (in Coulter, Wiens and Fenstermacher, 2008) believes that it is possible to discuss spiritual

experience in secular schools without promoting or undermining religion (p.188). Bignell (In Stibbe, Eds., 2009) goes further, stating “the changes that sustainability demands go beyond material changes in our surroundings, to cognitive change, or more simply, a change of mind, upon which the psychological and spiritual health, the very sanity of humanity as well as its future survival depends” (p.194). I think it is essential for us to include space for students to feel comfortable experiencing disequilibrium, awe and mystery for the natural world around them, and that this might be a positive and fulfilling experience while simultaneously meeting the goals of education for environment. For educators to recognize that spirituality and religion can be parsed is a first step.

Recommendation 2: Schools should look to increase their capacity for offering Technology Education courses or skills across grade levels.

Maguire and McCloat (In Assadourian and Mastny, Eds., 2017) outline how Home Economics (named Technology Education in Manitoba) has “distinct qualities and progressive potential in enabling a future-oriented education and practice towards global sustainable well-being” (p.165). The subject area in Manitoba includes Family Studies, Food and Nutrition, Human Ecology, Textile Art and Design and Environmental Design courses. As a discipline, Technology Education seeks to achieve healthy and sustainable living for individuals, families and societies (Maguire and McCloat In Assadourian and Mastny, Eds., 2017, p.166). This is a premise that aligns very closely with the Earth Charter (2000b), specifically the prologue to the manifesto that states, “life often involves tensions between important values. This can mean difficult choices... we must find ways to harmonize diversity with unity, the exercise of freedom with the common good, short-term objectives with long-term goals” (Earth Charter, 2000b).

McLaren (2015) outlines that Technology Education provides space for learners to, apply designerly thinking through action based challenges which explore issues and opportunities, seeking to address design challenges which offer engagement to enhance, alter, change, innovate; recognise the integration and inter-dependency of people, place, culture, society, economy, industry, and environment through craft, design, engineering and developments over time; critique consequences of proposed and / or existing actions, systems, environments and artefacts; participate in meaningful and authentic contexts; identify complexity, issues and scenario-based design challenges; and recognise and select indigenous and appropriate technologies (McLaren in Stables and Keirl, Eds., 2015, p.147).

It is clear from this selected list that there are multiple components which can be pulled from Technology Education curricula that align with the a variety of the principles of the Earth Charter (2000b).

As with the Earth Charter (2000b), Maguire and McCloat (In Assadourian and Mastny, 2017) state that the ideals of Technology Education “incorporate diverse content from the social, physical, and human sciences, contextualizing, applying, and consolidating knowledge related to everyday healthy, resourceful, and sustainable living for individuals” (p.166). In countries such as Finland, Korea, Japan and Northern Ireland, home economics is a compulsory component of the curriculum in junior cycle education (Joint Committee on Children and Youth Affairs, May 30 2018), where it is taught as a skills-based course. Students are provided with the opportunity to learn and apply their understanding of the material in an authentic environment. This might look like cooking their own meals, making their own clothes, or designing and building spaces

conducive to community health and well-being. Skills taught in the Technology Education classroom can support skills development for adaptation to climate change, and as Maguire and McCloat state, should be considered “a central component of a future-oriented curriculum” (In Assadourian and Mastny, Eds., 2017, p.176).

A relatively new area of research in education pertains to the notion of ‘transition skills’. Stephen Quilley from the University of Waterloo has written extensively about the practice that focuses learning around artisan skills such as crafts in woodland, building, field, workshop, textile and domestic areas (Quilley in Stibbe, Ed., 2009, p.47-48). Examples of these include carpentry, stone-walling, iron-forging, pottery, knitting, sewing and cooking. This approach to education is linked to transition communities - a growing number of communities that are moving away from a fossil fuel based economy, towards more sustainable modes of life, so that they are more prepared for a post-oil world (More of this can be found in Rob Hopkins text, *The Transition Handbook*, 2008). Many of these skills can be found in the Technology Education classroom - skills that provide a sustainable alternative to consumer culture. Any conversation with someone a generation older leads us to realize that in Western society we are losing this institutional memory of creating, fixing and reusing that was a normal practice in the past. Technology Education could provide that important link.

Findings from my study suggest that there is a high average code occurrence per page in the Technology Education curriculum documents, which also includes high CO for *human rights / rights* (12), *justice / injustice* (11), *resilience* (17), *consume / consumption* (29), *sustainable / sustainability* (30), *action / praxis* (11), and *reduce / reuse / recycle* (12), with many of these codes fill gaps in other MCD. Capacity increase at a school level to offer Technology Education

programming might include ensuring that facilities exist for effective instruction in cooking, textile design and construction, and access to organizations that support application of Family Studies learning. In addition school faculty should include members capable of running courses in Technology Education.

Beyond this, schools should actively encourage students to select Technology Education courses, which beyond making compulsory is an investigation in itself. Schools may decide to move towards making one or more Technology Education courses as compulsory for graduation, or seek to integrate elements of the MCD into other courses, such as English Language Arts, Physical / Health Education, Woodworking, Social Studies, Mathematics or Science.

Recommendation 3: The Government of Manitoba should seek to reform the Grade 9 and 10 Social Studies and Grade 9 Science curriculum.

As discussed in Chapter Two, when completing a comparative study between CAIRA, a public school in Costa Rica and Manitoban schools Metz et. al. (2010), a main recommendation of the group was to integrate the Grade 10 Social Studies and Science courses. Their conclusions for application to education in Manitoba are worth detailing in full:

The redesign and merger of the grade ten courses in science and social studies, using ESD as the context, guided by the necessary outcomes from the disciplines, and incorporating a significant local component which puts our young people in the field studying and helping to solve community problems. Such a merger makes available the time needed to overcome scheduling difficulties and allows for a significant participatory component in the local community. This new course, if compulsory for all Grade 10

students, would bring about implementation of ESD as espoused by national goals, and place students in their communities for at least a portion of their schooling. Such a proposal could lay the foundation for good science learning, civic participation, and awareness of, and informed action towards, the long-term health of local communities (Metz, et. al., 2010, p.166).

The merger component advocated by Metz et. al., (2012) will be detailed in *Recommendation 4*, but for *Recommendation 3*, I would like to explore why there are deficiencies in the Grade 9 and 10 Social Studies and Grade 10 Science MCD.

My study has detailed the weakness of the courses owing to their low CO and average CO per page, which has been echoed by the previous work of Kraljevic (2011), Jacques (2012), Belton (2013), Michalos et. al. (2015), Eckton (2015), Henderson (2016) and the broader study by Babiuk and Falkenberg (2010) that have targeted the Grade 9 and 10 Social Studies and in particular the Grade 10 Science curriculum as not fit for its purpose as a flagship course for Education for Sustainable Development. As a result, I would advocate that these courses be redesigned using the Grade 12 Global Issues course as a model, with specific focus on providing more space for teacher discretion in content, opportunities for student inquiry, and community action projects. A support document for teachers that uses the Earth Charter (2000b) as its foundation should be a starting point for learners.

Taking the general outline of the courses as is, Grade 9 Social Studies could include such Earth Charter (2000b) codes as human rights, diversity, human development, poverty, ethics, peace, security, politics, democracy and forms of government, equality, equity and gender. The Grade 9 course should invite opportunities for cross-curricular learning, invite experts into the

classroom as often as possible, require students learn through place-based experiences as often as possible, and require student action and community action projects as much as possible.

According to the results of my study, notable weaknesses in these courses include a lack of focus on resilience, ecology, sustainability, consumption, ecosystems, precautionary principle, pollution, ethics and conservation (Grade 9 Science); nature, biosphere, ecosystems, resilience, consumption, politics, sustainability, precautionary principle, and pollution (Grade 10 Science); and, human rights, justice, peace, consumption, poverty, ethics, sustainability, equity and gender (Grade 9 Social Studies). A deficiency of action and praxis is obvious for all three courses.

Grade 9 Science only had 142 CO, Grade 10 Science 131 CO, and Grade 9 Social Studies 189 CO.

As suggested by Metz et. al., (2010) Grade 10 Social Studies and Grade 10 Science should be redesigned so that they merge into a larger course. Learning could be built on the Grade 9 Social Studies and Science courses and include focuses on life, the natural world, systems thinking, resilience, health and human well-being, the biosphere, ecological systems, consumption and consumerism, sustainable living, conservation / restoration / rehabilitation, renewable energy, and the notion of the precautionary principle. Focuses should include local content curated by teachers, but allowing space for student inquiry. Teachers would need to be provided with resources that identify and critique the root causes of environmental degradation, such as an analysis of racism, sexism, gender, capitalism, consumerism, colonialism, dependency on oil, as well as political ideologies that exclude. The expectation should be that learners are provided with an extensive period of time for community action projects. Ideally this course should be offered during an extensive block of time and to this we now turn.

Further Recommendations

Recommendation 4: Schools should look to move away from subject-specific blocks of the school day and begin to integrate courses.

Orr (2017) advocates strongly for moving away from siloed subject areas, stating that “we do not organize education the way we see the world... instead we have organized education like mailbox pigeon holes, by disciplines that are abstractions organized for intellectual convenience” (Orr in Assadourian and Mastny, Eds., 2017, p.37). From a human knowledge perspective, separating spaces, objects, actions has helped organize the world. The ever widening horizons of human knowledge required categorization in an effort to understand and flourish in our world. For example, we might think ‘When I go here, I expect to see this’ and ‘When I see this person, I act this way’. Eighteenth century Swedish scientist Carl Linnaeus understood this, and around a century after Descartes proposed that we separate and elevate humans from the natural world, Linnaeus formalized a organizational system for plants and animals. His work laid the foundations for a binomial system of classification which denotes genus and species names. Even today his ideas allow zoologists and botanists to communicate through language barriers (Cleveland-Peck, 2007, p.2).

But nature does not operate this way - it is well established and outlined in this study that nature operates in systems, and therefore our learning around this should also seek to mirror this and incorporate multiple subject areas within larger inquiry. When considering questions around the environment, we are increasingly required to see its operation within society, the economy and human well-being. To effectively do this requires considering content outlined in Social

Studies, Mathematics, English Language Arts, Physical / Health Education as well as Science.

David Orr argues that this needs to be done *before* considering more advanced levels of disciplinary knowledge (Orr in Assadourian and Mastny, Eds., 2017, p.37). Starting with the context to which this learning takes place provides a foundation for understanding its application.

An example of combining classes at the Senior Years level is High Tech High in San Diego, California. In the documentary *Most Likely to Succeed* (2015) Ted Dintersmith explores the approach that High Tech High takes, by combining two courses into either morning or afternoon blocks. The courses are supported by co-teaching, where two educators specializing in different subjects, collaborate to provide foundational theory and practical knowledge to learners, who are then encouraged to represent it through larger project work. In one example a philosophy and drama class are combined leading students to create a play on human rights in the Middle East, in another a history and woodworking class are combined leading students to use laser-cutters to build gear-powered machines that demonstrated the rise and fall of ancient civilizations (*Most Likely to Succeed*, 2015).

A further example of breaking apart subject blocks is my own school, Maples Met, which is based on the Big Picture Learning model created by Dennis Littky and Elliot Washor. In a class of 15 students an Advisor is responsible for supporting learners through completing their compulsory and elective courses from Grade 9 to 12. Advisors provide foundational instructional support, but more often support students as they develop 'Essential Questions' connected to topics of interest to them. Advisors link this work to Manitoba curriculum outcomes to ensure that they are meeting the expectations set forth by the Province. What this often looks like is students integrating subject areas into larger projects. For example, a student

undertook a project into the experience of children in Canada during the Chinese Head Tax era, which drew in elements of Grade 11 History of Canada, English Language Arts, Reading is Thinking, History of Canada, Family Studies and Grade 12 Psychology. In another project she researched the brain development of children at the elementary years, and designed learning experiences for Grade 1 and 2 students, that she then carried out at her internship at an elementary school, participating in a Book Study with faculty across the Division. Another student oriented his project work around his internship at a local environmental advocacy group, and undertook a research project on the decline of the Tall-Grass Prairie in Manitoba, as well as creating a course for community members that outlined the benefits of wildlife conservation in urban areas. In these two projects he integrated Grade 11 English Language Arts, Reading is Thinking, elements of Mathematics, Grade 11 Topics in Science and Career Development. Essential to making these projects possible was moving beyond the 70 minute time blocks assigned to specific subjects.

In *The Big Picture: Learning is Everyone's Business*, Littky (2004) wonders why we continue to silo subjects: “What is science without math? What is history without language? What are languages without their history?” (p.29). Littky links North American education today to 1892, where a group of post-secondary professors gathered to outline their plan for a one-size-fits-all approach to public education, whereby every subject would be taught the same way to all students. The goal at the time was to churn out people like factories churned out cars (p.29-30). Times have indeed changed, and society needs citizens with completely different knowledge and skill sets, particularly if we are to work towards providing a holistic world view and improving the knowledge, attitudes and actions towards the environment.

The research on integrating subject areas is strong. Focusing on integrating of STEM subjects, a meta-analysis by Becker and Park (2011) found positive impacts on learning throughout the K-12 system. In her meta-analysis of 30 studies examining the effects of integrated curriculum programs on student achievement, Hartzler (2000) found overwhelming evidence to support the conclusion that students in integrated curriculum programs do better on standardised and program-developed assessments of achievement than students in traditional classrooms (Hartzler in Shriner, Schlee, and Libler, 2010, p.52). Breunig, Murtell, Russell and Howard (2014) reported that two education for environment programs in Ontario found that integrated programming led to significantly new learning and increase in environmental knowledge that led to individual everyday behaviors, including water usage, recycling bottles and cans, and turning off lights when leaving a room (p.377). The resulting new knowledge was also found to have encouraged learners to influence the behaviors of others around them (p.378).

In addition to responding to contemporary needs and improving academic performance, there are a number of benefits to moving away from subject-specific blocks of time. Firstly, this allows two or more subjects to be blocked together, as argued for in *Recommendation 3*. Larger blocks of time (for example, a whole morning or afternoon) means that educators can get out of the school and into the community to learn from or apply their knowledge. Secondly, it allows more flexibility in instruction and allows a more responsive approach to the needs of learners. At any point, a day can be reconfigured to address a project or community need. Thirdly, learners could design their work for a particular morning or afternoon to suit the needs of their project, which helps to develop their maturity, organization, self-management and maturity. Fourthly, the deconstruction of walls around subject areas is a more authentic representation of

life. Living in the world or undertaking real-world projects, rarely do they fit exclusively within a specific subject area - as Littky (2004) states,

many people talk about how difficult it is to implement an integrated curriculum... that is ridiculous. The world is integrated! What is difficult is what schools do everyday: unravel the world and put it into boxes called subjects and separate things that are not separate in the real world (p.28).

Finally, it provides educators with the time to get students to get out into the community to undertake action or praxis. This application of knowledge and attitudes will be now discussed.

Recommendation 5: When undertaking curriculum reform, the Government of Manitoba should increase the expectation that students undertake an action component in demonstrating their understanding of content.

Throughout this study I have advocated for learners to take their knowledge and attitudes and put it to action, ideally in an authentic environment. This is based on the perspective that knowledge without action leaves learners impotent and unable to fully realize themselves as participants in life capable of playing an active role as citizens. Gadotti (in Steiner, Krank, Bahruth and McLaren, 2004) expresses this ideal more fully, sharing that pedagogy intends to be put into practice. Learning,

makes no sense without practice, as it is the science of education. To act pedagogically is to put theory into practice *par excellence*. It is to discover and elaborate instruments of social action. In doing so, one becomes aware of the essential unity between theory and practice... pedagogy is, above all, a theory of praxis (p.121)

Washor and Mojkowski (2013) outline the value of this practice in *Leaving to Learn*. Great teachers they claim, “help students find and communicate with adults and other students who are working on similar interests and projects. Students learn how to engage these adults in serious conversations about their work and observe how they do that work” (p.79). Schools meanwhile, must “help students undertake complex projects based on questions with no easy solutions nested in real-world settings and contexts” (p.81). This approach takes the traditional idea of teacher as knowledge-keeper and replaces it with teacher as learning facilitator and guide.

Bowers (2009) refers to this learning space outside of the classroom as the cultural commons, a place where students can get away from destructive forces of Western society, and connect with participants,

“who have a clear understanding about the differences between consumerism and community self-reliance [who] will help the students to think more deeply about what areas of the cultural commons are most relevant to their own talents, interests, and [support] their need for supportive relationships” (Bowers, 2009, p.403).

Only through this “face-to-face” approach can learners “confront the double bind that is inherent in the Western approach to progress where the further enclosure of the cultural and environmental commons is equated with achieving greater progress” (p.403). What is particularly evident in Bowers work is the idea that educational institutions have been co-opted by the dominant environmentally destructive practices. Bowers sees getting outside of the institution to connect with those on the ground at the forefront of environmental protection and regeneration is essential. The face-to-face component leads to questions and investigation that opens to critical perspective.

My study has concluded that there is a deficiency in action or praxis requirements across the Manitoba curriculum documents. While there is a significant requirement in Social Studies courses for action projects, these are mostly concentrated in Grade 10 Social Studies (61 CO), Grade 12 Global Issues (51 CO), and Grade 9 Social Studies (24 CO). Grade 11 Topics in Science does include 12 CO, but across the remaining MCD, there is no requirement for learners to put theory into meaningful community action, particularly beyond the school walls. Other subjects such as Science, English Language Arts and to an extent Physical / Health Education have low CO. Technology Education does have 'learning by doing' inherent to its approach and other subject areas could learn from this.

So what would this look like? Richard Kahn (In Darder et. al., 2009) maintains that a Western critical literacy would,

doubtless involve taking action on issues at both an individual and collective level, engaging with ecological and sustainable countercultures, rescuing animals and habitats whenever possible, and working for revolutionary counter-hegemonic social change generally in favor of abolishing civic hierarchies based on race, class, gender and other categories of identified social difference (p.533-534).

Herein lies the crux of the an action / praxis approach - it provides learners with the opportunity to play an active role in questioning hegemonic practices and reshaping the world towards a more just society as outlined in the Earth Charter (2000b).

Recommendation 6: The Government of Manitoba should move towards making Grade 12 Global Issues a compulsory course for graduation.

One course that should be made compulsory for graduation is Grade 12 Global Issues. Owing to the high CO and average CO per page, making this course a part of every learners graduation plan would be a meaningful and relatively easy policy to implement. It bears repeating that according to the results of my study, Grade 12 Global Issues represents the best example of exposure to content closely associated with the Earth Charter (2000b), and does so while allowing learners the opportunity to pursue learning that aligns with their interests and encourages an *action / praxis* component.

Making Global Issues a compulsory course for graduation would bring the number of compulsory courses for graduation from 17 to 18, and compulsory courses at the Grade 12 level to four (alongside English Language Arts, Physical / Health Education and a Mathematics course). This would still provide students in Manitoba the chance to take 12 elective courses. It would also mean that a Social Studies course is compulsory at each of the four Senior Years levels (along with Grade 9 Social Studies, Grade 10 Geography and Grade 11 History of Canada). At present, using the data provided by Seven Oaks School Division, only 4.2% of eligible students (that is, students enrolled in Grade 12) are enrolled in the course, which only reinforces the need to make the course more than an elective.

It is recommended that Grade 12 Global Issues be offered not as an isolated subject, but integrated into other subject areas, such as English Language Arts, Physical / Health Education, Technology Education, a Science course, or ideally multiples thereof. This would be more challenging for schools to implement. But doing so would allow learners to link elements from

these courses to content from Grade 12 Global Issues, and open up space for undertaking a community action project. As previously discussed later in *Recommendation 4* combining subject areas into larger time blocks would provide space for this to occur effectively.

Recommendation 7: When undertaking curriculum reform, the Government of Manitoba should create space for teachers to support authentic real-world application of learning through a project-based approach.

To take learning through praxis further is to hand over more autonomy to learners. An increasingly popular way to do this is through project-based learning. We all do projects. Think about it: Have you made a new years resolution to get in shape? Decided to undertake a home renovation? Learned a new language? Projects start with a goal for which we need to draw together a plan of action, research, resources, and the knowledge of experts. The process can be grueling, we need to create the time in our schedule and persevere through challenges. Reaching a goal through projects is a journey in self improvement, human development and meaning-making. Through learning how to change the winter tires on our car, grow our own vegetables and darn our worn out socks we find reward in the process and find an increase in self-efficacy and discover something about the world and ourselves in the process.

Educators around Manitoba are taking this idea and bringing it to their learning spaces through ‘project-based learning’ (PBL) - an approach to education that orients student experiences and work around an big idea. Robin Plouffe-Hingley, an Itinerant Instructional Support Teacher in Louis Riel School Division, calls PBL the “gold standard of teaching” and an opportunity for kids “to work for extended periods of time on a question that is authentic and engaging” (Personal Correspondence, April 4, 2018). Steve Taylor from St. James School

Division uses PBL in his Grade 4 French Immersion classroom. He calls the PBL approach different from traditional teaching because “in PBL you're giving the power over directly to the students... [and] when they are able to explore an idea in whichever form they feel best suited to follow, it gives them ownership and power over their learning.” Taylor has found success by taking a PBL approach in his classroom with creating a ‘classroom economy’ with students taking on jobs and learning about their roles within society (Personal Correspondence, April 4, 2018).

As previously mentioned, Big Picture Learning is a whole-school project-based learning approach developed by Dennis Littky and Elliot Washor in Rhode Island during the 1990's. It took started as the vision of reconnecting youth with education and raising graduation rates. Inspired by the philosophy of John Dewey, in 2000 Littky and Washor opened The Met School - a place where students would be at the centre of their own learning, spend significant time in the community under the tutelage of mentors, and demonstrate their learning with exhibitions rather than standardized tests.

A whole-school, all-day approach is not necessary for implementing PBL. Working at Hapnot School in Flin Flon School Division, teacher Daniel Dillon provides space for his Grade 9 students to complete ‘20Time’ projects. 20Time gives students an hour a week for a semester to develop a research project connected to their passions, pulling on a variety of curriculum areas. Through this framework, students design, research, create and present their work to the community, focusing on each section for a month at a time. A unifying theme for PBL is the idea that learning should not be isolated to specific subject areas, but instead should integrate multiple content areas into larger projects (Personal Correspondence, April 4 2018).

Project-based learning aligns itself with Paulo Freire in rejecting the notion that the ‘banking model’, where a teacher as the expert provides the gift of knowledge to students, and expects that they retain and regurgitate on demand. Patrick Hansen of the Louis Riel School Division Propel program emphasizes on one-on-one conversations with students to guide understanding - an approach Hansen maintains “empowers students to develop meaning” (Personal Correspondence, April 4th 2018). Taylor echoes this, outlining that a variety of observational forms of assessment may lead a teacher to develop a ‘mini-lesson’ to address a specific knowledge gap (Personal Correspondence, April 4th 2018). While there is still a role for direct instruction, it acts as a supplementary tool rather than default pedagogical approach. Essentially, PBL provides a framework for learners to develop and expand the skills to collect, organize and share their journey of meaning making.

In a Masters of Education Thesis which conducted a meta-analysis of project-based learning Dann (2012) found a project-based approach to learning led to a statistically significant improvement of content knowledge over direct instruction (p.42-43). When undertaking project-based learning in a whole-school approach, additional benefits are that it encourages the creation of products to demonstrate learning, which invites Technology Education into the fold (*Recommendation 2*); de-siloing of subject areas (*Recommendation 3*); allows space for the integration of subjects (*Recommendation 4*); and provides the time and space for action or praxis (*Recommendation 5*).

Project-based learning provides a context for learners to roll multiple concepts and ideas into a deep and rigorous focus with meaningful and authentic hands-on learning, often taking place in the community. It hands power to learners to drive the learning, and opportunity to ask

critical questions of the world around them. It is these questions that direct instruction may not have the time or ability to ask, but are absolutely paramount if we are to rebuild society on planet earth towards a more equitable and sustainable place.

Recommendation 8: When undertaking curriculum reform, the Government of Manitoba should reduce the content of curriculum documents and provide space for teachers to make professional decisions.

When we talk about making learning meaningful to students, this means making connections with students already existing neural network. A number of scholars have written about the need for learners to have a foundational understanding of a concept for them to be able to build on this. Passarelli and Kolb (2012) apply this to the ‘learning cycle’, a cyclical approach where a learner continually takes in knowledge and uses it to deconstruct and rebuild prior knowledge. The learning cycle requires an ongoing process of action/reflection and experience/abstraction (p.71). Vygotsky (In Jones, Rua and Carter, 1998) outlines a theory stating that for a learner to understand a concept or internalize knowledge, they must be situated within an optimal zone - the zone of proximal development. This process of learning is enhanced with “prompting, modeling, explaining, asking leading questions, discussing ideas, providing encouragement, and keeping the attention centered on the learning context” (p.968). When abstract concepts that are both beyond the experiences that learners have had, or are likely to have, then it could be argued that they are harder to learn and not useful. There are of course examples that contradict this, but essentially my argument is that knowledge is both easier to grasp and more relevant when it starts with the learner, and that as a starting place experiences in the local community are the right place to start.

Wiliam (2018) explains that after socio-economic status of parents, the biggest indicator of student achievement in science was the ability of teachers to adapt instruction to meet student needs. He cites Ausubel (in Wiliam, 2018), an educational psychologist who states, “if I had to reduce all of the educational psychology to just one principle, I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teaching him (sic) accordingly” (p.165). Good instruction starts with where the learner is, and the teacher in the classroom is better placed to make that decision over a uniform always outdated Manitoba curriculum document.

The Earth Charter (2000b) emphasizes the need to ‘think local, act global’ stating, “we must decide to live with a sense of universal responsibility, identifying ourselves with the whole Earth community as well as our local communities” (Earth Charter, 2000b). For learning to be meaningful it needs to start on our doorstep, in our community. In many of the Manitoba curriculum documents, an overly prescriptive approach stifles the ability of an educator to provide meaningful learning opportunities for students to connect content to their lives. For example, a rich learning experience could present itself whereby students can seek to restore a creek close to the school. This experience might provide opportunities for learners to explore local vegetation, watersheds, different species that inhabit the creek, types of human behavior that harm wildlife and water quality, the history of the creek and uses in the past. This project might include students writing about and sharing their learning in the community, advocating at a political level and result in changes to their behavior towards more positive environmental actions. The work could take months, but be a rich and transformative experience, with real

authentic learning. Yet, an overly restrictive curriculum might mean that only a handful of outcomes are met or not taken at all owing to the traditional structure of a traditional school.

There are examples of freedom provided to an educator to make autonomous decisions littered through the MCD, but the outcomes that these opportunities are not flexible. It also constricts opportunities for drawing in elements of critical pedagogy to the learning environment. For example, if an educator wanted to examine a concept such as structural racism, the poverty cycle, the impact and political consequences of burst oil pipelines, the power wielded by multinational corporations, there may be space to do this, but when a student demonstrates evidence of learning, this cannot be connected to a curriculum outcome. The impact of this is that a teacher may be less likely to instruct on this issue, or find value in assessing it. Issues such as the aforementioned are what Eisner (1979) refers to as the ‘null curriculum’ and when something is not taught, it has implications on the “kinds of options one is able to consider, the alternatives that one can examine, and the perspectives from which one can view a situation or a problem” (p.97).

Providing teachers with professional autonomy would allow them to design experiences that integrate multiple subject areas in an action project and for them to be able to give students credit for this work. Changing the Manitoba curriculum documents to allow more freedom for teachers to provide instruction and measure what is actually important, would create more space for authentic learning, and provide learners with the opportunity to undertake their positive actions towards the environment on a local level. It would also allow educators to adopt a critical pedagogy approach to instruction.

Recommendation 9: When undertaking curriculum reform or development, the Government of Manitoba should use the Earth Charter (2000b) as a guiding document.

As I hope to have made clear by this point in my study, along with a multitude of scholars across the world see the Earth Charter (2000b) as an excellent tool for framing education for environment. While space for outlining why the Earth Charter (2000b) is the right document for education was undertaken in Chapter Two, some considerations will be briefly emphasized.

Analyzing each of the four sections of the Earth Charter (2000b), we see ‘Respect and Care for the Community of Life’, ‘Ecological Integrity’, ‘Social & Economic Justice’ and ‘Democracy, Nonviolence & Peace’. These concepts could offer a strong foundation to a variety of courses currently offered, with the principles then digging deeper and exploring what guidelines educators might use to measure the success of meeting the goal of a section.

For example, (if taught independently of other courses) a Social Studies course could include a unit on ‘respect and care’ where teachers are encouraged to select a text that connects to this theme as a launching point for an inquiry into the Canadian healthcare system in order to conclude whether the Federal government should provide a national Pharmacare program. The Government of Manitoba could work with local non-for-profit organizations such as Fort Whyte Alive to develop an English Language Arts program that takes students out into a nature to read poetry written about the environment, scaffolding students to write their own original texts. A Technology Education course could include a list of resources to support teachers investigate the production of clothing in sweatshops, connecting with the sourcing of school clothing, and with a

view to convincing a shift towards a more ethical brand. Or, a series of learning outcomes could be infused into each of the Senior Years courses, that purposefully require students to make connections between the natural sciences and other principles such as the right to a clean environment, the impact of hydroelectric dams on animal populations, or the impact of unsustainable agricultural practices on the land.

Adopting the Earth Charter (2000b) would require a shift in thinking for what we want our schools to look like day to day, and what characteristics we would want a graduate of the Manitoba public school system to embody. Gadotti (2010) argues that when rethinking public education, we need to shift towards a social learning instead of a fact-based approach. When keeping in mind education for environment, he states that one of the main obstacles will be to “overcome the naturalistic view of the environment and to embrace a systemic view containing multiple, undetermined and interdependent causalities to conceive a learning environment of sustainable management beyond the promotion of isolated actions” (p.206). The Earth Charter (2000b) recognizes the work involved in both restoring the human relationship with the planet, and rehabilitating natural systems encompasses part of a larger project of a reconstructing of many human social norms and practices. Its four sections and sixteen principles are direct enough to guide educators, yet flexible to be molded to fit the needs of students and the the community.

Conclusion

With the publication of the *Truth and Reconciliation Commission of Canada: Calls to Action* (2015), policy makers were provided with a framework from which to to redesign and

reorient education in Canada. The report led to a variety of institutions to rally behind a critical common goal: reconciliation between First Nations peoples and settlers on the territory now called Canada. The *Calls to Action* outlined a number of different policy suggestions for different areas of Canadian society, amongst them Child Welfare, Health, Language and Culture, and Education.

In 2018, Kairos released their *Education for Reconciliation Report Card* (2018) which analyzed the extent to which Provinces had demonstrated their ability to implement Call to Action 62.i. Manitoba had moved from a grade of ‘Good’ to ‘Excellent’ for ‘Public Commitment’ and from ‘Needs Improvement’ to ‘Excellent’ in ‘Implementation’ of the *Calls to Action*. In particular, the Province of Manitoba was praised for,

legislated support for Indigenous learners and the inclusion of mandatory Indigenous content in schools. Social Studies, now mandatory from grades 1 to 11, covers Treaties, Residential Schools, and the Contributions of Aboriginal Peoples. Curriculum has been developed in consultation with Aboriginal Peoples via the First Nations, Métis and Inuit Education Policy Framework. The province has instituted multiple training programs and teaching guides for educators to enhance accurate delivery of Indigenous content. Some of these are mandatory, while others are optional. (Kairos, 2018, p.6)

What is particularly striking here is that the *TRC Calls to Action* emerged as the result of a societal issue (of note: Residential Schools, the Sixties Scoop, Intergenerational Trauma) and developed a framework to address changing knowledge, attitudes and actions through education. Organizations such as Kairos are monitoring and publishing their findings of the progress of Provinces with ongoing reports that outline what has been achieved in terms of meeting the Calls

to Action, as well as what still needs to be worked on. In many ways, the TRC Calls to Action are an example of what can be achieved when a critical mass of support and accountability meet towards a common goal.

These are the same conditions that impetus for the Earth Charter (2000b) originated. It is over 30 years since *Our Common Future* (1987) captured the world attention with their own calls to action. Yet since that time the planet and its human inhabitants have slid into an ever-increasingly perilous state. The underlying imperative from then remains today, and it can play a crucial role in the rethinking of education in Manitoba. Imagine: like the TRC Calls to Action, the Earth Charter (2000b) became a resource for policy makers to guide their decision making in reforming curriculum? What if School Divisions designed their Mission Statements, and schools curated their yearly School Plan around meeting the criteria of the Earth Charter (2000b)? What if Faculties of Education required postsecondary students to implement principles of the Earth Charter (2000b) into every lesson plan? What if students within the K-12 public school system were not measured by their ability to regurgitate content that they were 'gifted with' by a classroom teacher, but were measured yearly by their ability to demonstrate knowledge, attitudes and actions that aligned with the Earth Charter (2000b)? The Earth Charter (2000b) is the radical document that we need in these times to conceptualize our relationship with each other and the planet that sustains us.

This paper began with a literary connection of *Barkskins* (2015) a tale about about humans from different backgrounds re-connecting and collaborating to reach a common goal - restoration of a part of their local environment after over two centuries of abuse. Solutions happen when groups come together to meet a common goal, and as teachers we hold tremendous

potential to shape the society of tomorrow. We must take the opportunity to rescue ourselves for the sake of our future - and it starts with reforming education. I will end with the same words that conclude the Earth Charter,

Let ours be a time remembered for the awakening of a new reverence for life, the firm resolve to achieve sustainability, the quickening of the struggle for justice and peace, and the joyful celebration of life.

Earth Charter (2000b).

Appendix A: The Earth Charter (2000b)

1. Respect Earth and life in all its diversity.

- Recognize that all beings are interdependent and every form of life has value regardless of its worth to human beings.
- Affirm faith in the inherent dignity of all human beings and in the intellectual, artistic, ethical, and spiritual potential of humanity.

2. Care for the community of life with understanding, compassion, and love.

- Accept that with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people.
- Affirm that with increased freedom, knowledge, and power comes increased responsibility to promote the common good.

3. Build democratic societies that are just, participatory, sustainable, and peaceful.

- Ensure that communities at all levels guarantee human rights and fundamental freedoms and provide everyone an opportunity to realize his or her full potential.
- Promote social and economic justice, enabling all to achieve a secure and meaningful livelihood that is ecologically responsible.

4. Secure Earth's bounty and beauty for present and future generations.

- Recognize that the freedom of action of each generation is qualified by the needs of future generations.

- Transmit to future generations values, traditions, and institutions that support the long-term flourishing of Earth's human and ecological communities.
5. Protect and restore the integrity of Earth's ecological systems, with special concern for biological diversity and the natural processes that sustain life.
- Adopt at all levels sustainable development plans and regulations that make environmental conservation and rehabilitation integral to all development initiatives.
 - Establish and safeguard viable nature and biosphere reserves, including wild lands and marine areas, to protect Earth's life support systems, maintain biodiversity, and preserve our natural heritage.
 - Promote the recovery of endangered species and ecosystems.
 - Control and eradicate non-native or genetically modified organisms harmful to native species and the environment, and prevent introduction of such harmful organisms.
 - Manage the use of renewable resources such as water, soil, forest products, and marine life in ways that do not exceed rates of regeneration and that protect the health of ecosystems.
 - Manage the extraction and use of non-renewable resources such as minerals and fossil fuels in ways that minimize depletion and cause no serious environmental damage.
6. Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach.
- Take action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive.
 - Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm.

- Ensure that decision-making addresses the cumulative, long-term, indirect, long distance, and global consequences of human activities.
- Prevent pollution of any part of the environment and allow no build-up of radioactive, toxic, or other hazardous substances.
- Avoid military activities damaging to the environment.

7. Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being.

- Reduce, reuse, and recycle the materials used in production and consumption systems, and ensure that residual waste can be assimilated by ecological systems.
- Act with restraint and efficiency when using energy, and rely increasingly on renewable energy sources such as solar and wind.
- Promote the development, adoption, and equitable transfer of environmentally sound technologies.
- Internalize the full environmental and social costs of goods and services in the selling price, and enable consumers to identify products that meet the highest social and environmental standards.
- Ensure universal access to health care that fosters reproductive health and responsible reproduction.
- Adopt lifestyles that emphasize the quality of life and material sufficiency in a finite world.

8. Advance the study of ecological sustainability and promote the open exchange and wide application of the knowledge acquired.

- Support international scientific and technical cooperation on sustainability, with special attention to the needs of developing nations.
- Recognize and preserve the traditional knowledge and spiritual wisdom in all cultures that contribute to environmental protection and human well-being.
- Ensure that information of vital importance to human health and environmental protection, including genetic information, remains available in the public domain.

9. Eradicate poverty as an ethical, social, and environmental imperative.

- Guarantee the right to potable water, clean air, food security, uncontaminated soil, shelter, and safe sanitation, allocating the national and international resources required.
- Empower every human being with the education and resources to secure a sustainable livelihood, and provide social security and safety nets for those who are unable to support themselves.
- Recognize the ignored, protect the vulnerable, serve those who suffer, and enable them to develop their capacities and to pursue their aspirations.

10. Ensure that economic activities and institutions at all levels promote human development in an equitable and sustainable manner.

- Promote the equitable distribution of wealth within nations and among nations.
- Enhance the intellectual, financial, technical, and social resources of developing nations, and relieve them of onerous international debt.

- Ensure that all trade supports sustainable resource use, environmental protection, and progressive labor standards.
- Require multinational corporations and international financial organizations to act transparently in the public good, and hold them accountable for the consequences of their activities.

11. Affirm gender equality and equity as prerequisites to sustainable development and ensure universal access to education, health care, and economic opportunity.

- Secure the human rights of women and girls and end all violence against them.
- Promote the active participation of women in all aspects of economic, political, civil, social, and cultural life as full and equal partners, decision makers, leaders, and beneficiaries.
- Strengthen families and ensure the safety and loving nurture of all family members.

12. Uphold the right of all, without discrimination, to a natural and social environment supportive of human dignity, bodily health, and spiritual well-being, with special attention to the rights of indigenous peoples and minorities.

- Eliminate discrimination in all its forms, such as that based on race, color, sex, sexual orientation, religion, language, and national, ethnic or social origin.
- Affirm the right of indigenous peoples to their spirituality, knowledge, lands and resources and to their related practice of sustainable livelihoods.
- Honor and support the young people of our communities, enabling them to fulfill their essential role in creating sustainable societies.
- Protect and restore outstanding places of cultural and spiritual significance.

13. Strengthen democratic institutions at all levels, and provide transparency and accountability in governance, inclusive participation in decision making, and access to justice.

- Uphold the right of everyone to receive clear and timely information on environmental matters and all development plans and activities which are likely to affect them or in which they have an interest.
- Support local, regional and global civil society, and promote the meaningful participation of all interested individuals and organizations in decision making.
- Protect the rights to freedom of opinion, expression, peaceful assembly, association, and dissent.
- Institute effective and efficient access to administrative and independent judicial procedures, including remedies and redress for environmental harm and the threat of such harm.
- Eliminate corruption in all public and private institutions.
- Strengthen local communities, enabling them to care for their environments, and assign environmental responsibilities to the levels of government where they can be carried out most effectively.

14. Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life.

- Provide all, especially children and youth, with educational opportunities that empower them to contribute actively to sustainable development.
- Promote the contribution of the arts and humanities as well as the sciences in sustainability education.
- Enhance the role of the mass media in raising awareness of ecological and social challenges.

- Recognize the importance of moral and spiritual education for sustainable living.

15. Treat all living beings with respect and consideration.

- Prevent cruelty to animals kept in human societies and protect them from suffering.
- Protect wild animals from methods of hunting, trapping, and fishing that cause extreme, prolonged, or avoidable suffering.
- Avoid or eliminate to the full extent possible the taking or destruction of non-targeted species.

16. Promote a culture of tolerance, nonviolence, and peace.

- Encourage and support mutual understanding, solidarity, and cooperation among all peoples and within and among nations.
- Implement comprehensive strategies to prevent violent conflict and use collaborative problem solving to manage and resolve environmental conflicts and other disputes.
- Demilitarize national security systems to the level of a non-provocative defense posture, and convert military resources to peaceful purposes, including ecological restoration.
- Eliminate nuclear, biological, and toxic weapons and other weapons of mass destruction.
- Ensure that the use of orbital and outer space supports environmental protection and peace.
- Recognize that peace is the wholeness created by right relationships with oneself, other persons, other cultures, other life, Earth, and the larger whole of which all are a part.

References

- Ainsworth, J. (2013). *Sociology of Education: An A-to-Z Guide*. Los Angeles, CA: SAGE Publications.
- Altheide, D. L. (2000). Tracking discourse and qualitative document analysis. *Poetics*, 27(4), 287–299.
- Andersson, B. (2007). Curriculum content in the light of education for sustainable development – Some proposals. In Inger Björneloo & Eva Nyberg (Eds.). Paris: UNESCO. *Drivers and barriers for implementing learning for sustainable development in pre-school through upper secondary and teacher education*.
- Anderson, H., & Falkenberg, T. (2016). The role and status of food and nutrition literacy in Canadian school curricula. *Alberta Journal of Educational Research*, 62(1), 87–109.
- Antunes A., & Gadotti M. (2006). Ecopedagogy as the appropriate pedagogy to the Earth Charter (2000) process. In Blaze P., Vilela M., & Roerink A. (Eds), *The Earth Charter (2000) in action: Toward a sustainable development* (pp. 135–137). Amsterdam: Kit Publisher.
- Assadourian, E., Mastny, L. (Eds.) (2017). *EarthEd : Rethinking education on a changing planet*. Washington, DC: Island Press.
- Associated Press. (2017, November 3). US report finds climate change 90% manmade, contradicting Trump officials. *The Guardian*. Retrieved from <https://www.theguardian.com/environment/2017/nov/03/climate-change-report-us-government-contradicts-trump>
- Atwood, M. (2012). *Survival: A thematic guide to Canadian literature*. Toronto, ON: House of Anansi Press.

- Babbie, E. (2001). *The practice of social research* (9th ed.). Belmont, CA.: Wadsworth Publishers.
- Babiuk, G. & Falkenberg, T. (2010). *Sustainable development and living through changing teacher education and teaching in Manitoba* (pp. 1–241). Winnipeg, MB: University of Manitoba.
- Bai, H. (2015). Peace with the earth: Animism and contemplative ways. *Cultural Studies of Science Education, 10*, 135–147.
- Becker, K & Park, H. (2011). Effects of integrative approaches among science, technology, engineering, and mathematics (STEM) subjects on students' learning: A preliminary meta-analysis. *Journal of STEM Education, 12* (5), 23-37.
- Bekoff, M. (2016, March 18). The world becomes what we teach: Humane education is key. Retrieved August 18, 2017, from <https://www.psychologytoday.com/blog/animal-emotions/201603/the-world-becomes-what-we-teach-humane-education-is-key>
- Belton, C. (2013). *Successes, drivers and barriers of education for sustainable development in Canada, England and Australia*. (Unpublished Master's Thesis) University of Manitoba, Winnipeg, MB.
- Berg, B., & Lune, H. (2012). *Qualitative research methods for the social sciences* (8th ed.). Boston, MA: Pearson.
- Berry, W., & Grubbs, M. A. (2007). *Conversations with Wendell Berry*. Jackson, MS: University Press of Mississippi.

- Blumstein, D., & Saylan, C. (2007). The Failure of Environmental Education (and How We Can Fix It) (Essay). *PLoS Biology*, 5(5), E120.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40.
- Bowers, C. A. (1997). *The culture of denial: Why the environmental movement needs a strategy for reforming universities and public schools*. Albany, NY: State University of New York Press.
- Bowers, C. A. (2003). *Mindful conservatism: Rethinking the ideological and educational basis of an ecologically sustainable future*. Lanham, MD: Rowman & Littlefield Publishers.
- Bowers, C.A. (2009). The classroom practice of commons education. In D. Flinders & S. Thornton (Eds.), *The curriculum studies reader* (3rd ed.), pp. 399-424. New York, NY: Routledge.
- Breunig, M. (2005). Turning experiential education and critical pedagogy theory into praxis. *Journal of Experiential Education*, 28(2), 106–122.
- Breunig, M., Murtell, J., Russell, C., & Howard, R. (2014). The impact of integrated environmental studies programs: Are students motivated to act pro-environmentally? *Environmental Education Research*, 20(3), 372-386.
- British Broadcasting Corporation. (n.d.). *Arts and ideas: Soil stories old and new*. Retrieved from <http://www.bbc.co.uk/programmes/p04tqnpw>
- Brown, L., & Strega, S. (2015). *Research as resistance : Revisiting critical, indigenous, and anti-oppressive approaches*. (2nd ed.). Toronto, ON: Canadian Scholars Press.

- Caldas-Coulthard, C. R., & Coulthard, M. (Eds.). (2003). *Texts and practices: readings in critical discourse analysis*. London, United Kingdom: Routledge.
- Callenbach, E. (1981). *Ecotopia: The notebooks and reports of William Weston*. New York, NY: Bantam Books.
- CBC News. (2017a, June 22). Churchill's main retailer to stop subsidizing food prices on June 25. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/manitoba/manitoba-churchill-food-subsidy -1.4172407>
- CBC News. (2017b, August 1). Winnipeg Harvest sends care package to Churchill. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/manitoba/care-package-churchill-1.4230221>
- Chambers, C. (1999). A topography for Canadian curriculum theory. *Canadian Journal of Education*, 24(2), 137.
- Cleveland-Peck, P. (2007). Garden of Sweden. *History Today*, 57(5), 2-3.
- ConocoPhillips. (n.d.). What is oil used for? Retrieved August 1, 2017, from <http://alaska.conocophillips.com/what-we-do/oil-production/Pages/what-is-oil-used-for.aspx>
- Costley, K. (2015). Research Supporting Integrated Curriculum: Evidence for using this Method of Instruction in Public School Classrooms. (Unpublished Research Paper). Arkansas Tech University.
- Cotter, J. (2017, May 1). One year after Fort McMurray wildfire, experts warn of increased threat. *Global News*. Retrieved from <http://globalnews.ca/news/3417385/one-year-after-fort-mcmurray-wildfire-experts-warn-of-increased-threat/>
- Coulter, D. L., Wiens, J. R., & Fenstermacher, G. D. (2008) *Why Do We Educate? Renewing the Conversation*. Malden, MA: The National Society for the Study of Education.

- Dann, C. (2010). *Is Project Based Learning More Effective than Direct Instruction in School Science Classrooms? An Analysis of the Empirical Research Evidence*. (Unpublished Master's Thesis) University of Manitoba, Winnipeg, MB.
- Darder, A., Baltodano, M., & Torres, R. D. (Eds.). (2009). *The critical pedagogy reader* (2nd ed). New York, NY: Routledge.
- Dewey, J. (2007). *Experience And Education*. New York, NY: Simon & Schuster.
- Diaz, H. P., Kulshreshtha, S. N., Sauchyn, D. J., University of Regina, & Canadian Plains Research Center. (2010). *The new normal: the Canadian prairies in a changing climate*. Regina, SK: CPRC Press.
- Eckton, H. M. (2016). *Education for sustainable living: exploring the landscape of one urban high school's sustainability practices and values*. (Unpublished Master's Thesis) University of Manitoba, Winnipeg, MB.
- Edenhofer, O & Rockström, J. (2018, October 5). Charge €30 a tonne for CO2 to avoid catastrophic 4C warming. *The Guardian*. Retrieved from <https://www.theguardian.com/environment/2018/oct/05/charge-30-a-tonne-for-co2-to-avoid-catastrophic-4c-warming>
- Eisner, E. (1979). *The educational imagination : On the design and evaluation of school programs*. London : New York: Collier-Macmillan; Macmillan.
- Flick, U., Kvale, S., Angrosino, M. V., Barbour, R. S., Banks, M. (2007). *The Sage qualitative research kit*. London, United Kingdom: SAGE.
- Flick, U. (2002). *An introduction to qualitative research*. Los Angeles, CA: Sage Publications.
- Freire, P. (2004). *Pedagogy of indignation*. Boulder, CO: Paradigm Publishers.

- Freire, P. (2011). *Pedagogy of the Oppressed*. New York, NY: Continuum Publishing..
- Gadotti, M. (2010). Reorienting education practices towards sustainability. *Journal of Education for Sustainable Development*, 4(2), 203–211.
- Gall, M., Borg, W. R., & Gall, J. P. (1996). *Educational research : An introduction* (6th ed.). White Plains, N.Y.: Longman.
- Gillis, J. (2017, January 18). Earth sets a temperature record for the third straight year. *New York Times*. Retrieved from <https://www.nytimes.com/2017/01/18/science/earth-highest-temperature-record.html>
- Given, L. M. (Ed.). (2008). *The Sage encyclopaedia of qualitative research methods*. Los Angeles, CA: Sage Publications.
- Goleman, D. (2010). *Ecological Intelligence: The Hidden Impacts of What We Buy*. New York, NY: Broadway Books.
- Goleman, D., Bennett, L., & Barlow, Z. (2012). *Ecoliterate: How educators are cultivating emotional, social, and ecological intelligence* (1st ed). San Francisco, CA: Jossey-Bass.
- Goodwin, H. (2017, May 11). The Trudeau conundrum. Retrieved August 1 2017, from <https://www.theworldweekly.com/reader/view/storyline/2017-05-11/the-trudeau-conundrum/10026>
- Gramsci, A., & Hoare, Q. (1985). *Selections from the prison notebooks of Antonio Gramsci* (8. pr). New York, NY: International Publishers.
- Gruenewald, D. A. (2004). A Foucauldian analysis of environmental education: Toward the socioecological challenge of the Earth Charter (2000). *Curriculum Inquiry*, 34(1), 71–107.
- Harari, Y. N. (2016). *Sapiens: a brief history of humankind*. New York, NY: Harper.

- Hart, P. (2002). Environment in the science curriculum: The politics of change in the Pan-Canadian science curriculum development process. *International Journal of Science Education*, 24(11), 1239–1254.
- Heath, C., & Heath, D. (2011). *Switch: How to change things when change is hard*. Waterville, ME: Thorndike Press.
- Heinberg, R. (2010). *Peak Everything: Waking Up to the Century of Declines*. New York, NY: New Society Publishers.
- Henderson, M. (2016). *Bridging the ecological knowledge and knowledge-action gaps: a utopian vision for education in Manitoba*. (Unpublished Master's Thesis) University of Manitoba, Winnipeg, MB.
- Hickman, L. (2012, June 12). James Lovelock on shale gas and the problem with greens. Retrieved February 27, 2018, from <https://www.theguardian.com/environment/blog/2012/jun/15/james-lovelock-fracking-greens-climate>
- Howell, A. J., & Passmore, H.A. (2013). The nature of happiness: Nature affiliation and mental well-being. In C. L. M. Keyes (Ed.). *Mental Well-Being. International Contributions to the Study of Positive Mental Health*, 231–257.
- Hsieh, H., & Shannon, S. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Jacobson, S. K., McDuff, M., & Monroe, M. (2006). *Conservation education and outreach techniques*. Oxford, United Kingdom: Oxford.

- Jacques, C. (2012). *The green Don Quixotes: Values development of education for sustainable Development teachers*. (Unpublished Master's Thesis) University of Manitoba, Winnipeg, MB.
- Jardine, D.W. (2010). *Encyclopaedia of curriculum studies*. (C. A. Kridel, Ed.). Thousand Oaks, CA: SAGE Publications.
- Jóhannesson, I. Á., Norðdahl, K., Óskarsdóttir, G., Pálsdóttir, A., & Pétursdóttir, B. (2011). Curriculum analysis and education for sustainable development in Iceland. *Environmental Education Research*, 17(3), 375–391.
- Joint Committee on Children and Youth Affairs debate (2018). House of the Oireachtas. Retrieved from https://www.oireachtas.ie/en/debates/debate/joint_committee_on_children_and_youth_affairs/2018-05-30/3/
- Jones, M., Rua, M., & Carter, G. (1998). Science teachers' conceptual growth within Vygotsky's zone of proximal development. *Journal of Research in Science Teaching*, 35(9), 967-985.
- Kahn, R. V. (2008). Green theory and praxis. *Green Theory & Praxis: The Journal of Ecopedagogy*, 4(1), i–iv.
- Kahn, R. V. (2010). *Critical pedagogy, ecoliteracy, & planetary crisis: the ecopedagogy movement*. New York, NY: Peter Lang.
- Kairos Canada. (2018). *Education for Reconciliation Report Card: A Report Card on Provincial & Territorial School Curriculum Concerning Indigenous Peoples in Canada that is part of the KAIROS Winds of Change Campaign*. Toronto, ON. Retrieved from https://www.kairos-canada.org/wp-content/uploads/2018/10/KAIROS_2018ReportCardSummary.pdf
- Kincheloe, J. L. (2004). *Critical pedagogy primer*. New York, NY: P. Lang.

Kincheloe, J. L. (2008a). *Critical pedagogy primer* (2nd ed.). New York, NY: P. Lang.

Kincheloe, J. L. (2008b). *Knowledge and critical pedagogy*. New York, NY: Springer.

Klein, N. (2014). *This changes everything: capitalism vs. the climate*. New York, NY: Simon & Schuster.

Kohut, T. (2017, March 21). Expect more “extreme and unusual” weather in 2017: report.

Global News. Retrieved from

<http://globalnews.ca/news/3324912/expect-more-extreme-and-unusual-weather-in-2017-report/>

Kolbert, E. (2014). *The sixth extinction: An unnatural history*. London, United Kingdom: Bloomsbury.

Kraljevic, G. M. (2011). *Does the Manitoba science curriculum help teach teens to be more environmentally-minded?* (Unpublished Master’s Thesis) University of Manitoba, Winnipeg, MB.

Kridel, C. A. (2010). *Encyclopaedia of curriculum studies*. Thousand Oaks, CA: SAGE Publications.

Krippendorff, K., & Bock, M.. (2009). *The content analysis reader*. Thousand Oaks, CA.: Sage Publications.

Lather, P. (1986). Issues of validity in openly ideological research: Between a rock and a soft place. *A Quarterly Review of Education*, 17(4), 63–84.

Leal Filho, W. (2002). *Teaching sustainability at universities: Towards curriculum greening* (Vol. 11). Peter Lang Pub Inc.

- Leonard, L., & Barry, J. (Eds.). (2009). *The transition to sustainable living and practice*. Bingley, United Kingdom: Emerald.
- Lindqvist, A., Kostenius, C., Gard, G., & Rutberg, S. (2015). Parent participation plays an important part in promoting physical activity. *International Journal of Qualitative Studies on Health and Well-Being*, 10, International Journal of Qualitative Studies on Health and Well-Being, 2015, Vol.10.
- Littky, D. (2004). *The Big Picture: Learning is Everyone's Business*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Louv, R. (2008). *Last child in the woods: saving our children from nature-deficit disorder* (Updated and expanded). Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Lovelock, J., & Tickell, C. (2007). *The revenge of Gaia why the Earth is fighting back, and how we can still save humanity*. London, United Kingdom: Penguin Books.
- Luke, A. (1995). Chapter 1: Text and discourse in education: An introduction to critical discourse analysis. *Review of Research in Education*, 21(1), 3–48.
- Mabro, R. (2006). *Oil in the 21st century: issues, challenges and opportunities*. New York, NY: Oxford University Press.
- MacLean, C. (2017, July 8). Churchill, Man., weighs risk of climate change on future of port, railway. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/manitoba/churchill-climate-change-port-railway-1.4193531>
- Manitoba Education and Advanced Learning (n.d.-a). Education for Sustainable Development in Manitoba Education and Advanced Learning. Government of Manitoba. Retrieved from http://www.edu.gov.mb.ca/k12/esd/pdfs/esd_mb.pdf

Manitoba Education and Advanced Learning (n.d.-b). Social Studies, Grade 12 Global Issues:

Citizenship and Sustainability (40S). Government of Manitoba. Retrieved from

http://www.edu.gov.mb.ca/k12/cur/socstud/global_issues/index.html

Manitoba Education and Advanced Learning (n.d.-c). The Three Pillars of Education for

Sustainable Development. Government of Manitoba. Retrieved from

<http://www.edu.gov.mb.ca/k12/esd/>

Manitoba Education and Advanced Learning (n.d.-d). “Graduation Requirements for the English

Program.” Manitoba Education and Advanced Learning. Retrieved from

http://www.edu.gov.mb.ca/k12/policy/gradreq/docs/grad_req_en.pdf

Manitoba Education and Advanced Learning (n.d.-e). Education and Training: Curriculum.

Government of Manitoba. Retrieved from <http://www.edu.gov.mb.ca/k12/cur/process.html>

Manitoba Education and Advanced Learning (n.d.-f). Education and Training: Curriculum.

Government of Manitoba. Retrieved from <http://www.edu.gov.mb.ca/k12/cur/types.html>

McKeown, R., & Nolet, V. (Eds.). (2013). *Schooling for sustainable development in Canada and the United States*. New York, NY: Springer.

McKibben, B. (n.d.). Why we need to keep 80% of fossil fuels in the ground. Retrieved

November 4, 2017, from [https://350.org/why-we-need-to-keep-80-percent-of-](https://350.org/why-we-need-to-keep-80-percent-of-fossil-fuels-in-the-ground/)

[fossil-fuels-in-the-ground/](https://350.org/why-we-need-to-keep-80-percent-of-fossil-fuels-in-the-ground/)

Mclaren S.V. (2015) Policy Formulation and Enactment. In: Stables K., Keirl S. (eds)

Environment, Ethics and Cultures. International Technology Education Studies, vol 5.

Sense Publishers, Rotterdam.

- Metz, D., McMillan, B., Maxwell, M., & Tetrault, A. (2010). Securing the place of educating for sustainable development within existing curriculum frameworks: A reflective analysis. *Canadian Journal of Environmental Education, 15*, 150–169.
- Michalos, A., Kahlke, P., Rempel, K., Louhivuori, A., MacDiarmid, A., Creech, H., & Buckler, C. (2015). Progress in measuring knowledge, attitudes and behaviours concerning sustainable development among tenth grade students in Manitoba. *An International and Interdisciplinary Journal for Quality-of-Life Measurement, 123*(2), 303–336.
- Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-being: Synthesis*. Washington, DC: Island Press.
- Misiaszek, G. (2015). Ecopedagogy and citizenship in the age of globalisation: Connections between environmental and global citizenship education to save the planet. *European Journal of Education, 50*(3), 280–292.
- Most Likely to Succeed*. (2015). [DVD] Directed by G. Whiteley. USA: One Potato Products.
- Newman, R. S., & Payne, D. G. (Eds.). (2005). *The Palgrave environmental reader*. New York, NY: Palgrave Macmillan.
- Noddings, N. (2003). *Happiness and education*. New York, NY: Cambridge University Press.
- Orr, D. W. (1992). *Ecological Literacy: Education and the Transition to a Postmodern World*. Albany, NY: AState University of New York Press.
- Orr, D. W. (1994). *Earth in mind: on education, environment, and the human prospect*. Washington, DC: Island Press.

- Passarelli, A. M., & Kolb, D. A. (2012). The Learning Way: Learning from Experience as the Path to Lifelong Learning and Development. In *The Oxford Handbook of Lifelong Learning* (p.70-90). Oxford University Press.
- Pepper, D. (1996). *Modern environmentalism: An introduction*. London, United Kingdom: Routledge.
- Peters, J. (Ed.). (2007). *Wendell Berry: Life and work*. Lexington, KY: University Press of Kentucky.
- Petz, S. (2018, October 4). 'Hotter hot spells and colder cold spells': climate change already making mark on Manitoba. *CBC News*. Retrieved from <https://www.cbc.ca/news/canada/manitoba/climate-change-manitoba-un-report-1.4862555>
- Prairie Climate Centre. (2018). *Climate Atlas*. Retrieved from https://climateatlas.ca/map/canada/plus30_2060_85
- Proulx, A. (2016). *Barkskins: a novel*. New York, NY: Scribner.
- Rapley, T. (2007). *Doing conversation, discourse and document analysis*. London, United Kingdom: SAGE Publications.
- Rockstrom, J. (2010). Planetary boundaries. *New Perspectives Quarterly*, 27(1), 72–74.
- Roessger, K. (2017). From Theory to Practice: A Quantitative Content Analysis of Adult Education's Language on Meaning Making. *Adult Education Quarterly*, 67(3), 209-227.
- Rogers, R., Schaenen, I., Schott, C., O'Brien, K., Trigos-Carrillo, L., Starkey, K., & Chasteen, C. C. (2016). Critical discourse analysis in education: A review of the literature, 2004 to 2012. *Review of Educational Research*, 86(4), 1192–1226.

- Salehi, A., & Mohammadkhani, K. (2013). The school curriculum as viewed by the critical theorists. *Procedia - Social and Behavioral Sciences*, 89, 59–63.
- Sapsford, R. & Jupp, S. (2006). *Data Collection and Analysis* (2nd ed.). London: SAGE Publications.
- Sauer, P. (2002). Global ethics: An American perspective. *Orion Magazine*. Retrieved from <https://orionmagazine.org/article/global-ethics-an-american-perspective/>
- Savage, M. (2018, April 7). ‘Richest 1% on target to own two-thirds of all wealth by 2030’. *The Guardian*. Retrieved from <https://www.theguardian.com/business/2018/apr/07/global-inequality-tipping-point-2030>
- Saylan, C. (2011). *The failure of environmental education (And how we can fix it)*. Berkeley, CA: University of California Press.
- Shellenberger, M., & Nordhaus, T. (2009). The death of environmentalism. *Geopolitics, History and International Relations*, 1(1), 121–163.
- Shriner, M., Schlee, B. M., & Libler, R. (2015). Teachers’ Perceptions, Attitudes and Beliefs Regarding Curriculum Integration. *The Australian Educational Researcher*, 37(1) 51-62.
- Stapp, W. B. (1969). The concept of environmental education. *The Journal of Environmental Education*, 1(1), 30–35.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Sörlin, S. (2015). Sustainability. Planetary boundaries: guiding human development on a changing planet. *Science (New York, N.Y.)*, 347(6223), 1259855.
- Steinberg, S. R., & Cannella, G. S. (Eds.). (2012). *Critical qualitative research reader*. New York, NY: Peter Lang.

Steiner, S. S., Krank, M. H., Bahruth, R. E., & McLaren, P. (2004). *Freirean Pedagogy, Praxis and Possibilities: Projects for the New Millennium*. New York, NY: Routledge.

Stibbe, A. (Ed.). (2009). *The handbook of sustainability literacy: skills for a changing world*. Totnes, United Kingdom: Green.

Stone, M. (2010, October 9). What is education for sustainable living? Center for Ecoliteracy.

Retrieved from <https://www.ecoliteracy.org/article/what-education-sustainable-living>

Suarez-Villa, L. (2003). The e-economy and the rise of technocapitalism: Networks, Firms, and Transportation. *Growth and Change*, 34(4), 390–414.

Suhasini, R., & Barry, E. (2016, November 4). Delhi closes over 1,800 schools in response to dangerous smog. *New York Times*. Retrieved from [https://mobile.nytimes.com/2016/11/05/world/asia/delhi-closes-over-1800-schools-in-response-to-dangerous-smog.html?referer=](https://mobile.nytimes.com/2016/11/05/world/asia/delhi-closes-over-1800-schools-in-response-to-dangerous-smog.html?referer=world/asia/delhi-closes-over-1800-schools-in-response-to-dangerous-smog.html?referer=)

Sutherland, S. (2016, June 21). Three years later: What caused the 2013 Alberta floods? *The Weather Network*. Retrieved from <https://www.theweathernetwork.com/news/articles/why-was-southern-alberta-so-vulnerable-to-flooding-in-2013/29800>

Tahirali, J. (2012, October 12). Energy lessons. *Canadian Geographic*, 132, 8. Retrieved from <http://uml.idm.oclc.org/login?url=https://search-proquest-com.uml.idm.oclc.org/docview/1314351814?accountid=14569>

Thomson Reuters. (2017, February 14). Air pollution in China, India accounted for 2.2 million deaths in 2015: study. *CBC News*. Retrieved from <http://www.cbc.ca/news/technology/china-india-air-pollution-deaths-1.3981769>

The Times of India. (2017, January 4). Heavy smog in large parts of China, over 150 flights cancelled. *The Times of India*. Retrieved from <https://timesofindia.indiatimes.com/world/china/heavy-smog-in-large-parts-of-china-over-150-flights-cancelled/articleshow/56325078.cms>

Truth and Reconciliation Commission of Canada. (2015). Truth and Reconciliation: Calls to Action. Winnipeg, MB. Retrieved from http://nctr.ca/assets/reports/Calls_to_Action_English2.pdf

United Nations. (1999). The world at six billion. United Nations. Retrieved from <http://www.un.org/esa/population/publications/sixbillion/sixbilpart1.pdf>

United Nations. (2000a). What is the Earth Charter (2000)? Retrieved from <http://earthcharter.org/discover/what-is-the-earth-charter/>

United Nations. (2000b). The Earth Charter. Retrieved from <http://earthcharter.org/discover/the-earth-charter/>

United Nations (n.d.-a). United Nations Sustainable Development Goals. United Nations. Retrieved from <https://en.unesco.org/themes/education-sustainable-development/what-is-esd/un-decade-of-esd?language=en>

United Nations. (n.d.-b). UN Decade of Sustainable Development. United Nations. Retrieved from <https://en.unesco.org/themes/education-sustainable-development/what-is-esd/un-decade-of-sd?language=en>

United Nations. (n.d.-c). UN and Climate Change: A Strong Scientific Consensus. Retrieved from <http://www.un.org/climatechange/the-science/>

- Union of Concerned Scientists. (n.d.). Is global warming fuelling increased wildfire risks? *Union of Concerned Scientists*. Retrieved from http://www.ucsusa.org/global_warming/science_and_impacts/impacts/global-warming-and-wildfire.html#.WgLX9iMrIy7
- Washor, E. & Mojkowski, C. (2013). *Leaving to Learn: How Out-of-School Learning Increases Student Engagement and Reduces Dropout Rates*. Portsmouth, NH: Heinemann.
- Watts, J. (2018, August 7). Domino-effect of climate events could move Earth into a ‘hothouse’ state. *The Guardian*. Retrieved from <https://www.theguardian.com/environment/2018/aug/06/domino-effect-of-climate-events-could-push-earth-into-a-hothouse-state>
- Weber, R. (1990). *Basic content analysis*. London, UK: SAGE.
- Weil, Z. (2014). *Most good, least harm: a simple principle for a better world and meaningful life*. New York, NY: Atria Books.
- Wherry A. (2017, September 3). “We are not well prepared”: An expert’s view of climate change and the next big storm. *CBC News*. Retrieved from <http://www.cbc.ca/news/politics/climate-change-adaptation-expert-panel-analysis-wherry-1.4271699>
- William, D. (2018). *Creating the Schools Our Children Need: Why What We’re Doing Now Won’t Help Much (and What We Can Do Instead)*. West Palm Beach, FL: Learning Sciences International.
- Woods, N., & Catanzaro, Marci. (1988). *Nursing research : Theory and practice*. St. Louis: Mosby. pp. 437-456).
- World Commission on Environment and Development. (1987). *Our common future*. Oxford, UK: Oxford University Press.

Worldwatch Institute. (2011). The state of consumption today. Worldwatch Institute. Retrieved from <http://www.worldwatch.org/node/810>