



uOttawa

L'Université canadienne  
Canada's university

**FACULTÉ DES ÉTUDES SUPÉRIEURES  
ET POSTDOCTORALES**



**uOttawa**

L'Université canadienne  
Canada's university

**FACULTY OF GRADUATE AND  
POSTDOCTORAL STUDIES**

**Kathryn Galvin**

AUTEUR DE LA THÈSE / AUTHOR OF THESIS

**M.A. (Education)**

GRADE / DEGREE

**Faculty of Education**

FACULTÉ, ÉCOLE, DÉPARTEMENT / FACULTY, SCHOOL, DEPARTMENT

**Environmental Education from a Postcolonial Perspective: Analyzing the Influence of UNESCO's  
Discourse on the Ontario Elementary Science Curriculum**

TITRE DE LA THÈSE / TITLE OF THESIS

**Nicholas Ng-A-Fook**

DIRECTEUR (DIRECTRICE) DE LA THÈSE / THESIS SUPERVISOR

CO-DIRECTEUR (CO-DIRECTRICE) DE LA THÈSE / THESIS CO-SUPERVISOR

**EXAMINATEURS (EXAMINATRICES) DE LA THÈSE / THESIS EXAMINERS**

**Sharon Cook**

**Richard Barwell**

**Givliano Reis**

**Gary W. Slater**

Le Doyen de la Faculté des études supérieures et postdoctorales / Dean of the Faculty of Graduate and Postdoctoral Studies

**ENVIRONMENTAL EDUCATION FROM A POSTCOLONIAL PERSPECTIVE:  
Analyzing the influence of UNESCO's discourse on the Ontario elementary science  
curriculum**

**By: Kathryn Galvin**

A thesis submitted in conformity with the requirements for the degree of Master of Arts  
Faculty of Education  
University of Ottawa



Library and Archives  
Canada

Published Heritage  
Branch

395 Wellington Street  
Ottawa ON K1A 0N4  
Canada

Bibliothèque et  
Archives Canada

Direction du  
Patrimoine de l'édition

395, rue Wellington  
Ottawa ON K1A 0N4  
Canada

*Your file* *Votre référence*  
ISBN: 978-0-494-61166-1  
*Our file* *Notre référence*  
ISBN: 978-0-494-61166-1

**NOTICE:**

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

**AVIS:**

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

---

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

  
**Canada**

## ACKNOWLEDGEMENTS

I begin by extending my appreciation to my committee members Richard Barwell, Sharon Cook and Guiliano Reis. I thank you all for your valuable feedback which has challenged both my writing and thinking.

I would like to express my gratitude to the Ontario Graduate Scholarship and the Faculty of Education, for the funding they have provided.

I express many thanks to Dominic Dostie for always lending an ear and being a wonderful soundboard.

My parents, Norine and Martin Galvin, I thank you deeply for your enduring support, not only throughout this research project, but throughout all the opportunities that have challenged me to grow and lead me to where I am now.

Finally, I would like to express my gratitude to my supervisor Nicholas Ng-A-Fook without your guidance this work would not have been possible. In particular, I wish to thank you for always having your door open, your books available and your constant encouragement and support.

## **ABSTRACT**

Over the past three decades curriculum scholars have failed to address environmental education through joint local, national, and/or global research initiatives, leaving UNESCO as an underpinning force in legitimizing and institutionalizing environmental education globally. This critical discourse analysis examines the connection between UNESCO's historical discourse on environmental education and the Ontario elementary science and technology curriculum. As a study grounded in curriculum theory, it leads to a nuanced understanding of the extent to which the local discourse reinscribes and/or subverts the global discourse on environmental education. The study also engages a postcolonial deconstruction of the discourse, exploring how the global and local discursive trends work to colonize or decolonize our relationship with the environment. This study reveals that what is important is not whether or not UNESCO's dominant discourse on environmental education is reinscribed and/or subverted in the local curriculum. But, rather how both contribute to the complicated discussion on environmental education.

## TABLE OF CONTENTS

LIST OF TABLES .....	viii
CHAPTER ONE: AN INTRODUCTION .....	1
Situating the Study .....	2
Overview of Study .....	4
Organization of Thesis .....	5
CHAPTER TWO: A LITERATURE REVIEW .....	7
Historical Context of UNESCO's Documents .....	7
Literature from Education Scholars on UNESCO's Discourse .....	10
Conversations among Curriculum Scholars .....	11
Discrepancy among Terms Utilized .....	12
Role of Locality in Environmental Education .....	13
Goal and Approaches of Environmental Education .....	15
CHAPTER THREE: A THEORETICAL FRAMEWORK .....	18
Curriculum Theory .....	18
Postcolonial Theory .....	23
CHAPTER FOUR: METHODOLOGY .....	26
Critical Discourse Analysis .....	26
Critical .....	27
Discourse .....	27
Analysis .....	28
Data Source .....	28
UNESCO's Landmark Documents .....	29
Ontario Elementary Science and Technology Curriculum .....	29

Analysis of Text .....	31
CHAPTER FIVE: ANALYSIS OF DISCOURSE .....	36
Literature Review on Key Concepts .....	39
Perceived Purpose of Education .....	40
Concept of Place .....	43
Science-Based Environmental Education .....	45
Analysis of UNESCO's Landmark Document .....	49
Purpose of Education .....	49
1975 and 1977 Documents – Cultural Production .....	49
1987 and 1992 Documents – Education for Economic Production .....	52
Summary of the Perceived Purpose of Education .....	55
Notion of Place .....	56
1975 and 1977 Documents – Thinking Globally .....	56
1987 and 1992 Documents – Thinking Locally .....	58
Summary of Place Responsiveness .....	61
Science-Based Environmental Education .....	61
Characteristic One .....	62
Characteristic Two .....	64
Characteristic Three .....	65
Summary of Science-Based Environmental Education .....	66
Summary of Key Concepts and Ideologies .....	67
Analysis of the Ontario Elementary Science and Technology Curriculum .....	69
Perceived Purpose of Ontario's Environmental Education .....	70
Place Responsiveness .....	73

Science-Based Environmental Education.....	75
Characteristic One .....	75
Characteristic Two.....	77
Characteristic Three.....	78
Summary of Ideologies Perceived within the Ontario Science and Technology Curriculum.....	79
CHAPTER SIX: A Postcolonial Deconstruction.....	80
A Postcolonial Deconstruction.....	80
Purpose of Education .....	81
Cultural Production – 1975 and 1977.....	82
Economic Production – 1987 and 1992.....	84
Ontario Elementary Science and Technology Curriculum.....	86
Place Responsiveness.....	88
Science-Based Approach to Environmental Education .....	94
Characteristic One .....	94
Characteristic Two.....	97
Characteristic Three.....	99
Summary of Postcolonial Analysis .....	100
CHAPTER SEVEN: IMPLICATION, LIMITATIONS AND CONCLUSION.....	102
Summary .....	102
Connection to Existing Literature .....	104
Implications.....	106
Colonizing Trends .....	107
Decolonizing Trends .....	108
Final Implications.....	110

Limitation of the Study .....	110
Conclusion.....	111
REFERENCES .....	113
APPENDIX A.....	120

## LIST OF TABLES

Table 4.1	Coding of Intergovernmental Conference on EE 1977 .....	32
Table 4.2	Summary of Coding Relevant to the Aim of Environmental Education and Education for Sustainable Development .....	33
Table 4.3	Coding Table for Ontario Elementary Science and Technology Curriculum .....	34
Table 5.1	Trends in the Predominant Ideologies Associated with Key Concepts.....	38
Table 5.2	Science-Based Characteristics of Environmental Education and Education for Sustainable Development .....	66
Table 5.3	Summary of Key Concepts and Ideologies Associated with Sustainable Development.....	67
Table 5.4	Summary of Key Concepts and Ideologies Associated with Environmental Education within the Ontario Elementary Science and Technology Curriculum.....	68

## CHAPTER ONE: AN INTRODUCTION

“The West abused the environment to get ahead and now you are telling us we cannot do the same.”

A former friend and colleague shared these words during my Engineer without Borders internship in Ghana. Although this statement was made in 2004 as a candid reaction to a United States Agency for International Development (USAID) conference on sustainable development, it continues to trouble me.

At that point in time, I was unaware that helping USAID organize and facilitate a conference on environmental sustainability would lead me to deeply question the impact that international development organizations have on local communities in Ghana. My colleague’s comment and other observations provoked me to consider the appropriateness of the conference’s curriculum. For example, is it possible for an international donor agency to have sufficient understanding of the local environmental and sociocultural contexts of Ghana’s Ashanti region in order to develop a curriculum on sustainable development relevant to that community? As I reflected critically on this question, I started to become uncomfortable with my role as a foreigner disseminating Eurocentric information about regional environmental issues.

Following my return from Ghana, the Ontario Ministry of Education released a revised version of the elementary science and technology curriculum. Prior to publishing this document, the Ministry made a public commitment to incorporate environmental education into every subject area within the next round of curricular revisions (Ontario Ministry of Education, 2007). Therefore, this science and technology curriculum was to include new aspects of environmental education. Upon its release, I immediately took interest in this document, wondering how it resembled and/or differed from the dominant international discourse on environmental education. Thus, this curricular development, combined with my experience in Ghana, is what

led me to pursue a study on the connection between the local and global discourse on environmental education.

Now that I have situated myself and my area of interest in the field of environmental education curriculum, I utilize the remainder of this introductory chapter to explain the general nature of the study, as well as to further contextualize my research. The chapter is divided into three parts. In the first section, I situate my study by providing a description of educational issues on which the research has been conducted. The second section provides an overview of the study's three methodological phases. Finally, the third section outlines how I have organized my thesis.

### *Situating the Study*

My current educational interests are anchored within the field of curriculum studies. A review of the literature within this field on environmental education indicates that, over the past three decades, curriculum scholars have failed to address environmental education to any great extent through joint local, national, and/or global research initiatives (Gough, 2003). Within the limited literature that exists, curriculum studies scholars point to the United Nations Educational, Scientific and Cultural Organization (UNESCO) as an underpinning force in legitimizing, institutionalizing, and influencing formal and non-formal environmental education globally (Kelsey, 2003; Sauve, 1996). Though many non-governmental organizations (NGOs) have both supported UNESCO's discourse and created counter-discourses on environmental education, UNESCO has remained in a position of relative authority. This is partly because of its ability to disseminate documents and organize conferences on a greater scale than any other single organization (Gough, 1999). From this position of authority, UNESCO continues to shape a

discourse internationally on environmental education through a myriad of widely circulated reports, agendas and charters (Kelsey, 2003).

Therefore, UNESCO's discourse is central to this project as I examine the connection between global and local thinking on environmental education. Within this discourse, one of the most widely promoted recommendations places the focus of environmental education squarely on the concept of "*sustainable development*" (Higgins & Kirk, 2006; Jickling & Wals, 2008). Thus, I analyze how the discursive trends<sup>1</sup> of the local curriculum reinscribe and/or subvert UNESCO's concept of *education for sustainable development* within the Ontario elementary science and technology curriculum. Moreover, many prominent curriculum and environmental education scholars have criticized that the term *education for sustainable development* remains ambiguous and undefined by UNESCO (Bonnett, 2007; Morris, 2002; Orr, 1994; Stables, 2004). These academic works, as well as a further review of the literature, helped me to formulate the following research questions:

- What ideologies are developed by UNESCO's historical discourse on *education for sustainable development*?
- How do the discursive trends represented within the Ontario elementary science and technology curriculum work to reinscribe and/or subvert UNESCO's historical discourse on the concept of *education for sustainable development*?
- How might postcolonial and curriculum theories provide a methodological filter to critically reread/deconstruct the ideologies developed by UNESCO's historical discourse, which are reinscribed and/or subverted within the elementary science and technology curriculum?

In order to address these questions, this study consists of three methodological phases, which I explain in the following section.

---

<sup>1</sup> For the purpose of this study, I describe *discursive trends* as the patterns identified within the discourse, including both patterns of change and/or uniformity.

## *Overview of Study*

The first methodological phase considers the aforementioned ambiguities associated with the concept of *education for sustainable development*. A review of several of UNESCO's key documents shows that this concept has developed and changed over several decades. Thus, the first phase is a detailed analysis of these documents. I describe this phase as a genealogical discourse analysis of a selection of UNESCO documents. This analysis, which I explain in greater detail in the methodology section, works to gain an understanding of how the concept of *education for sustainable development* emerged through the transformation of the dominant organizational discourse of UNESCO (Foucault, 1972). The objective of phase one is to better define the various meanings, including assumptions and implied beliefs, of the term *sustainable development* within the context of environmental education.

The next phase analyses the discursive trends represented within the text of the Ontario elementary school science and technology curriculum. My reading of curriculum documents is conducted in relation to my findings from the analysis of UNESCO's discourse. In this phase, I seek to provide the information required for the final phase. The final phase is an analysis and discussion of the relationships between the global discourse, from which the concept of *education for sustainable development* emerges, and the local Ontario science and technology curriculum documents. Utilizing postcolonial and curriculum theories as conceptual frameworks, an analytical filter if you will, I analyze the extent to which the Ontario elementary science and technology curriculum works to reinscribe and/or subvert UNESCO's discourse on environmental education. I conclude the study by synthesizing how my analysis might inform future research, policy, and/or practices/curriculum development in the classroom. I now provide an outline of how my thesis is organized.

### *Organization of the Thesis*

In this section I offer a brief glimpse of what is to come in each of the proceeding chapters. In the next chapter I provide a review of the scholarly literature. I look at two main bodies of literature: 1) scholarly writing specifically discussing UNESCO's discourse on environmental education; and 2) the writing on environmental education among curriculum scholars. This literature review suggests that UNESCO is thought to be an internationally influential organization. Also, the literature identifies the following three topics which are central to the writing of curriculum scholars on environmental education: 1) the most appropriate term for learning about the environment; 2) the role of place in environmental education; and 3) the most suitable goals and approaches for environmental education. In turn, I utilized this literature review to refine my three aforementioned research questions.

In chapter three, I discuss how curriculum and postcolonial theories inform my theoretical framework for addressing these three research questions. First, I explain how curriculum theory guides the way in which I approached the research questions and how I structured my analysis. In the second part of chapter three, I discuss how I utilize postcolonial theory as a lens to deconstruct my initial analysis, in order to gain a more nuanced understanding of the influences international environmental education discourse are having on the local curricular discourse.

The fourth chapter works to outline my methodology. This chapter is separated into three sections. I begin by situating the concept of critical discourse analysis. The second section provides the rationale for my selection of the primary data source. Finally, I provide a detailed description of how I conducted the analysis for each of the three phases of the study.

Chapter five details my discourse analysis. The chapter begins with a brief overview of my findings. This is followed by a second literature review on the concepts that emerged as key during the open coding strategies I employed. As I explain in more detail later, I placed this secondary literature review in the analysis chapter because it both shapes and is shaped by my analysis. The scholarly work reviewed provided background information on the several key concepts that helped me to construct the underlying ideologies associated with UNESCO's concept of *education for sustainable development*. Following my discussion of UNESCO's discourse, I turn to my analysis of the Ontario elementary science and technology curriculum document. The chapter concludes with a summary of the central ideologies I associate with UNESCO's historical discourse and Ontario's science and technology curriculum. In this summary I discuss to what extent UNESCO's ideologies are reinscribed and/or subverted through the Ontario elementary science curricular discourse.

My findings from chapter five are central to chapter six. In this chapter I deconstruct my initial analysis utilizing a postcolonial theoretical lens. I work to understand any underlying meanings within the discourse as well as to what extent to which colonizing and/or decolonizing trends are present within the discourse. I accomplish this by drawing on postcolonial scholarship to (re)read the coded sections of text from my initial analysis of both UNESCO's landmark documents and the Ontario elementary science and technology curriculum.

The final chapter discusses my perceived implications of the study. I highlight the contributions of the study as they pertain to both educators and researchers. I also outline a number of limitations associated with my research. I conclude the study by returning to the experience that largely influenced this study. I explain how conducting my research has allowed me to further reflect on this experience.

## CHAPTER TWO: A LITERATURE REVIEW

In this chapter, I work toward unravelling the complicated conversation amongst international curriculum scholars on environmental education and sustainability. My review of academic literature introduces two areas of discourse on environmental education: 1) scholarly writing which takes up UNESCO's discourse on environmental education; and 2) the environmental education conversation that is taking place among curriculum scholars.

The first area of literature provides readers with insight into how environmental education scholars perceive UNESCO's work. It also reveals the role scholars believe the organization should play in the field of environmental education. The second body of literature leads to a more nuanced understanding of the way in which the discourse on environmental education emerged and evolved within the discipline of curriculum studies. I approach this section of the literature review as a genealogical study, and look for emergent themes over the course of the historical discourse in the curriculum journals. In turn, the gaps in the literature review helped me to formulate my research questions. However, before I discuss the scholarly literature I introduce UNESCO's historical discourse by providing an overview of four key documents. The review of these documents provides us with an understanding of how and when the term *education for sustainable development* emerged. Reviewing these documents prior to the other literature allows for a more nuanced awareness of how curriculum scholars discuss *environmental education* in relation to UNESCO's historical discourse.

### ***Historical Context of UNESCO's Documents***

UNESCO labels the following four texts as key documents in the evolution of environmental education: 1) *The Belgrade Charter*; 2) the report from the *Intergovernmental Conference on Environmental Education*; 3) *International Strategy for Action in the field of Environmental*

*Education and Training for the 1990's*; and 4) *Agenda 21, Chapter 36: "Promoting Education, Public Awareness and Training"* (UNESCO, 2008). The analysis of these documents allows me to trace the emergence of the term *education for sustainable development*.

*The Belgrade Charter* was written following the first international workshop on environmental education. It was held to culminate a series of sub-regional and regional conferences worldwide. These conferences focused on developing a global strategic plan for designing environmental education programs. At the closing of the workshop, the participants, who included delegates from 60 nations, unanimously agreed upon a statement outlining the first set of guiding principles on environmental education. Within these international guidelines, the concept of *educating for sustainable development*, though not explicit, begins to emerge. As the Charter's introduction makes clear:

Significant changes must occur in all of the world's nations to assure the kind of rational development which will be guided by this new global ideal – changes which will be directed towards an equitable distribution of the world's resources and more fairly satisfy the needs of all peoples. (p. 1)

In turn, this statement provides an historical example of how these early documents address the environment as, first and foremost, a resource to be exploited for human gains. Consequently, the concept of sustainable development was perceived when it first emerged as a discourse supporting and perpetuating the exploitation of the environment (Bowers, 2004; Gough, 2003; Jicklings, 2008).

Another important outcome of the Belgrade workshop was the recommendation that an international conference series commence on environmental education. The first of these meetings took place two years later in Tbilisi, USSR. The final conference report from the 1977 *Intergovernmental Conference on Environmental Education* resembled the *Belgrade Charter* in

its focus on universal goals, objectives and guiding principles. Yet its suggestions go further, urging nations to include environmental education within their formal educational policies. One recommendation, which emerges from this report, is that education should incorporate cultural, social and economic aspects through a holistic approach. Again, though there are no explicit calls for *education for sustainable development*, scholars suggest the discourse continues to reproduce a curriculum supporting the economic and resource value of the environment (Gough, 1999; Jicklings, 1994).

Ten years later, a second conference was held to discuss the progress made during the previous decade, as well as the future global direction of environmental education. *Strategy for Action in the Field of Environmental Education for the 1990s* was written and published by the Secretariat of UNESCO, in collaboration with the Secretariat of the United Nations Environmental Program (UNEP), to summarize the conference's proceedings. The new language introduced in this report shows the continued discursive evolution related to environmental education and environmental issues writ large. For the first time in these landmark documents, reference is made to the concept of global warming. However, despite the mention of this global phenomenon, the importance of local considerations becomes increasingly prevalent. Furthermore, the phrase "sustainable development" is introduced for the first time. Although the report recommends that sustainable development should be "linked" to environmental education, it does not suggest it should be its sole aim.

In 1992, the United Nations held the Rio Earth Summit and *Agenda 21* was published as the summit's proceedings. Within this fourth landmark document, chapter 36 specifically addresses education. Here the discursive relationship between environmental education and sustainable development is definitive. More importantly, the document calls for a "reorientation"

of environmental education toward sustainable development. A transformation in the discursive trend is apparent. UNESCO and scholars alike perceive *Agenda 21* as an extremely influential document because it lays the groundwork for the 57<sup>th</sup> General Assembly's declaration of the Decade of Environmental Education for Sustainable Development (Gough, 1999; Jicklings, 2008). In the upcoming chapters, namely five and six, I methodically study these documents. I explain through my (de)construction of the ideologies which I perceive to be associated with UNESCO's concept of *education for sustainable development*, that the discursive trends discussed in this section are complex and carry multiple meanings.

### ***Literature from Education Scholars on UNESCO's Discourse***

I suggest the articles that discuss the connections between environmental education and UNESCO expose the organization's successes and failures in shaping global educational policies. Jickling (2008) describes UNESCO as having "championed" the conversation on environmental education. In particular, *Agenda 21* has historically influenced environmental education programs internationally. For example, the United Kingdom, a signatory of *Agenda 21*, currently promotes the document's central recommendations throughout their educational policies (Higgins & Kirk, 2006). Some scholars, such as Rissom (1992), look more holistically at UNESCO's position of authority. He highlights its more than 40 years of worldwide experience informing the field of education. Nonetheless, regardless of UNESCO's longstanding experience with regard to developing environmental education policies, curriculum scholars such as Gough (1993) are critical of its work. In turn, Gough cautions us that the environmental education discourse promoted by UNESCO provides only one perspective—that of a privileged, white, Eurocentric, English-speaking male.

I found that further criticism of UNESCO is directed at the use of the term *sustainable development*, which today is still central to its discourse on environmental education. “Sustainability,” Higgitt (2006) warns, “remains a nebulous concept that is variously defined, debated and deconstructed” (p. 251). His work demonstrates that the majority of university students define sustainability as solely resource-related. Only a small group suggested that the term can also reflect social justice. The implications of the term’s ambiguity, Higgins and Kirk (2006) explain, is the concept of sustainability being present in school curriculum, but in a disjointed manner.

This body of literature supports my decision to review UNESCO’s historical discourse on environmental education. Though the aforementioned scholarly writing is critical of UNESCO’s work, the organization is seen to influence the direction of environmental education discourse. To further direct my research questions, I turn to the historical discourse of environmental education among curriculum scholars.

### ***Conversations among Curriculum Scholars***

This next portion of the literature review is a genealogical reading of articles discussing environmental education in five major curriculum journals. Reviewing articles from as wide a time range as possible, I identified three distinct but overlapping areas within the literature on environmental education in the field of curriculum studies: 1) the discrepancy between the various terms utilized to define environmental education; 2) the role of locality/place in environmental education curriculum development and theory; and 3) the contention between the overarching goals and approaches to environmental education.

### *Discrepancy between Terms Utilized*

Over the past several decades there has been a significant shift from the term *environmental education* to the term *education for sustainable development*. This shift has been largely driven by the dominant discourse seen, for instance, in UNESCO's landmark documents and the United Nations' declaration for the Decade of Education for Sustainable Development. Despite the wide adoption of the term *sustainable development* in educational policies, scholars have remained highly critical of its use in relation to education. Referring to these landmark documents, Jickling (1994) tells us that *educating for sustainable development* is based on inaccurate concepts of education. The term *educating for* implies training for *something*, which is frequently linked to the acquisition of skills, and not a deep understanding of knowledge or the ability to apply such knowledge critically. Stables (2004), questions the very assumption that teaching and learning can bring about sustainable practices within society. Instead, he suggests the concept itself is unsustainable. Perhaps, Bonnett (2007) gives one of the more comprehensive arguments critical of the term *education for sustainable development*. His research challenges the World Commission on Environment and Development's definition of "sustainable development," that is to "meet the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 43). This definition, as Bonnett (2007) suggests, is deeply embedded in economic motives. Furthermore, it promotes anthropocentric values leading to the belief that nature is solely an object to be exploited for human needs. Unlike sustainable development, he suggests environmental education is "much richer and more profound" (Bonnett, 2007, p. 719). Therefore, environmental education should provide teachers and students with a more nuanced understanding of nature. In turn, this may work toward helping us establish a balanced relationship with our environment.

Bell and Russell (2000) have cautioned that the adoption of the term *sustainable development* by policy makers and the international community is a barrier for reversing our current global environmental crisis. This language “undermines our embodied sense of interdependence with a more-than-human world” (Bell and Russell, 2000, p. 193). Moreover, the anthropocentric values promoted through the discourse of *sustainable development* also inhibit a willingness to critique the current ways Western society interacts with our natural environment (Bonnett, 2007). He tells us such a critique is essential if the current environmental crisis is to be reversed.

As the term *education for sustainable development* becomes more prevalent in UNESCO’s discourse, so does the scholarly literature, which problematizes the term. Nonetheless, a clear definition of this term within an educational context remains absent. This in turn generates my first question of the study: What meanings and ideologies are developed and/or reproduced by UNESCO’s historical discourse on *education for sustainable development*? Next I look at the central role of locality in the scholarly literature.

### *The Role of Locality in Environmental Education*

Despite the global scope of environmental education, the role of local considerations emerged as a topic of particular significance for curriculum scholars. I perceived two distinct reasons for their emphasized consideration of local concerns. First, these scholars identify a deep-rooted relationship between local and regional history, culture and curriculum theory (Sumara, Davis & Laidlaw, 2001). For example, O’Sullivan’s (1999) work illustrates how the Radwanski report, commissioned by the Ontario Ministry of Education, influenced a shift in the province’s global education paradigm from one of global interdependence, to one of global economic

competitiveness. In turn, this policy shift generated more prescriptive curricular policies within Ontario.

The second reason, which I identified for focusing on local considerations, is that these scholars perceive culture as having an influence on one's perception of the environment within which they live. Many scholars suggest that cultural perceptions that objectify nature as a resourced commodity are the root cause of our current environmental crisis (Bowers 1995; Brookes 2002; Gruenewald, 2004a; and Stables, 2004). These scholars all point to the example of consumer-oriented cultures that value consumption at a vastly unsustainable rate in terms of planetary health. In regards to the strength of culture's influence Bowers (1995) writes, "the individual is nested in culture, and culture is nested within the natural system it supports" (p. 65). Furthermore, he suggests that if curriculum is to evoke the social consciousness necessary to overcome the current environmental crisis, it must take up the interrelationship between culture and the environments we live within. Curriculum must be located bio-regionally, Brookes (2002) adds, in order to provide students with an understanding of how their local landscape constructs national and local identities, and how local culture constructs knowledge of the regional ecology. Although locality is vital, Gruenewald (2004b) maintains that for curriculum theorizing it is equally important to understand global environmental politics. He therefore calls for a continued and open international conversation on environmental education issues.

UNESCO's landmark documents are in sync with the scholarly work highlighting the importance of locality, and recognizing that the environment is interconnected with sociocultural factors. How then do the discursive trends represented within the Ontario elementary science and technology curriculum work to reinscribe and/or subvert UNESCO's historical discourse on the concept of *education for sustainable development*?

I now look more closely at the debate between scholars on the goals and approaches best suited for environmental education.

### *Goals and Approaches of Environmental Education*

Another contentious topic I identified in the literature is the overarching goals of environmental education. The scholarship of Bowers (1995) and Morris (2002) suggest that environmental education should create the necessary social consciousness to bring about meaningful change in how society treats the environment. This is echoed by Annett Gough (1993), who calls for a socially critical curriculum that fosters a complex understanding of the environment and inspires students to participate in democratic transformation of society. Brookes (2002), Bonnett (2007) and Bell & Russell (2000) all suggest that the goal of environmental education should work toward decolonizing society's relationship with the environment we live within. They stress that our current environmental crisis is the result of a long-standing colonizing relationship with the land.

The curriculum approach best suited to take up environmental issues has been of even greater contention. The bulk of UNESCO's documents and the work of some academics, such as Scott & Oulton (1999), tell us that a cross-curricular and interdisciplinary approach would be the most effective because it allows environmental issues to be informed by a range of traditions and ideologies. Others, such as Ross (2007) and Bonnett (2007), suggest a cross-curricular approach is dangerous because it causes fragmented perspectives of the environment. Ross (2007) explains the discussion of an environmental topic in different subject areas results in an understanding that lies between the subjects, breaking the whole up into generalized interdependencies. Still, others maintain that a complete overhaul and reconceptualization of education is necessary. These scholars argue that cultural practices supported by education render environmental

education irrelevant (Gruenewald, 2004a; Bowers, 2004 and Orr, 1994). Bowers (1990) implies such reconceptualization is essential due to the epistemological foundations of the *Information Age*. One characteristic of this epistemological foundation, a reflection of the inundation of information, is the emphasis on data as the basis for decision-making. Yet another characteristic is a mindset that resembles that of a computerized Cartesian machine based on a closed binary system. Though this epistemological foundation may help us to understand the complexities of environmental degradation, they also hinder the understanding of cultural patterns, which in turn cause society to act as independent from the biotic community.

Despite these differences of opinion among scholars, there seems to be a common belief that by embedding environmental education within science curriculum, teachers and students will continue to perpetuate the current environmental crisis. The detrimental implications are clear. Here Bowers (2004) warns us:

The double bind is that while science-based approaches to environmental education promote the ethos of more efficiently managing and restoring ecosystems, students will not learn about the role of science in reinforcing the deep cultural assumptions that lead to environmentally destructive ways of thinking and behaviours. (p.225)

Moreover, the global use of Western science as the conduit for environmental education is seen as problematic. “Knowledge is,” as Hewson (1988) tells us, “a concept which is dependent on time, place and culture” (p. 317). He explains that other types of knowledge systems, which are frequently absent from the curriculum, can be effective in addressing environmental issues locally and globally. However, unlike science, Gradle (2007) expresses that arts education has a powerful ability to spark a connection with place. Such connections are essential for achieving environmental sustainability. As a result of these conflicting views, Gayford (1986) dismisses its incorporation completely. Though he gives no specific examples, he maintains that a more

appropriate place for environmental education is within the curriculum of non-formal community-based organizations.

The literature discussed above indicates that environmental education has a connection with culture and place. This is also echoed in the introduction to the Ontario elementary science and technology curriculum. Consequently, how might postcolonial and curriculum theories provide a methodological filter to critically reread/deconstruct the discursive trends within the Ontario elementary science and technology curriculum?

In the following chapter I explain how I situate my work in postcolonial and curriculum theories. It is here where these two distinct fields merge to form the theoretical framework for this project. In turn, I describe how this framework will guide me to a more nuanced understanding of the discourse analyzed.

## CHAPTER THREE: A THEORETICAL FRAMEWORK

This chapter is divided into two sections that describe different components of my theoretical framework. The first section discusses my use of curriculum theory, which provides the theoretical underpinning for the structure and approach of this study. The subsequent section explains how I situate postcolonial theory as a theoretical lens through which I deconstruct my analysis. Also, throughout both sections I introduce how different scholars within these fields take up the concepts of ideology, reproduction and resistance in order to better understand how discourse can reinscribe and/or subvert ideologies associated with environmental education.

### *Curriculum Theory*

Curriculum theory is situated within the broader field of curriculum studies. As such, scholars within this field seek to study the interdisciplinary relationships among curriculum, individual, and place (Pinar, 2004). This particular area of curriculum studies gained dominance throughout the 1970s to 1990s. During this period, a number of scholars worked to “reconceptualize” the field of curriculum studies. They shifted the conversations within the field toward *understanding* curriculum (Pinar, Reynolds, Slattery & Taubman, 1995). Prior to this period of “reconceptualization,” scholarly work within the field was predominantly focused on curriculum development and improvement (Marshall, Sears & Schubert; 2000). Johnson (1967) succinctly distinguishes the difference between these two areas:

...[individuals] in curriculum development – while interested in curriculum, are not particularly concerned with curriculum *theory*. After all, they feel, their concern is the practical one of improving the curriculum, not studying it. (p. 127)

Theorists must not, Johnson (1967) continues, base their work solely on immediate utility for curriculum improvement. Rather, he maintains there is an urgent need to study the curricular phenomena to ensure the field of curriculum studies is grounded in theory.

Pinar, Reynolds, Slattery & Taubman (1995) explain that curriculum theory gained dominance when the traditional field of curriculum studies ceased to provide the tools to address rapidly-changing social and cultural landscapes. Furthermore, as tension increased between the West and the Soviet Union during the height of the Cold War, a new focus on the technical aspects of curriculum developed. Curriculum increasingly became the role of specialists in the respective disciplines, threatening the very existence of the field of curriculum studies. In response, curriculum scholars realized a need to develop and firmly ground their field in theory (Marshall, Sears & Schubert, 2002). Consequently, curriculum theory can be described as the inquiry into the complex relationships among race, gender, multiculturalism, ecology, popular culture, and all other varying aspects of society (Pinar, Reynolds, Slattery & Taubman, 1995).

I draw upon the scholarship of curriculum theorists as I work toward understanding the complexities of how UNESCO's historical discourse is reinscribed and/or subverted by local curricular policies. I focus in particular on curriculum theory and theorists whose work takes up curriculum as a political text, which in turn reproduces and challenges dominant ideologies (Apple, 1990; Bowers, 2001; Pinar, Reynolds, Slattery & Taubman, 1995). Viewing curriculum and curricular policy through this lens shows they are neither culturally nor politically neutral. Theorists such as Apple, whose work I draw on consistently throughout the study, have written about the complex relationship between education systems, curriculum and the production of knowledge. Curriculum, Apple (1990) tells us, reproduces dominant ideologies through hidden mechanisms.

The term “ideology” was coined by the philosopher Destutt de Tracy to denote “the theory of ideas” (Althusser, 1971, p. 106). However, the term has remained fluid, evolving over the years (Althusser, 1971). Pinar, Reynolds, Slattery and Taubman (1995) refer to ideology in relation to curriculum theory as the production of meaning. Drawing on McLaren (1989), these authors explain: “ideology can be described as a way of viewing the world, a complex of ideas, various types of social practices, rituals and representation that we tend to accept as natural and as common sense” (p. 245). I suggest the Ontario elementary science and technology curriculum indicates that ideologies are embedded in environmental education. The policy document takes up this area of study as “an approach to critical thinking, citizenship and personal responsibility, [which] can be modelled” (p. 35). Moreover, ideology is a concept that extends beyond the theoretical. It is a set of symbols and actions, which are shaped by and shape the relationships between people and the material world in a society (Pinar, Reynolds, Slattery & Taubman, 1995). As a result, ideologies provide direction for decision-making and often involve constraining prescriptive elements (Huebner, 1961).

Dominant ideologies emerge and are constructed through social discourse (Gee, 1996). This includes the discursive trends of curricular policies and international reports, such as those produced by UNESCO (Apple, 1990). As ideologies are perpetuated through the dominant discourses, they have great reproductive force. For the purpose of this study, I describe *dominant discourse* as the widely accepted discourse, which is both controlled by and reinforces the values of institutions in a position of authority. Moreover, dominant discourse can be a conduit for the reinscription of ideologies. Here the reinscription of ideologies refers to the establishment of dominant values and beliefs through a different and/or stronger form. For example, Loomba (1998) suggests colonial ideologies are being reinscribed through the discourse of popular

culture. She draws attention to the story of Pocahontas, recently retold in a Disney movie, where a native female abandons her community for a life with a white man, who represents the colonizer. Loomba (1998) maintains this is one of many stories where the ideologies of colonialism are *reinscribed* utilizing the female body to symbolize the conquered land.

Curriculum policies, being a widely accepted discourse, are thus socializing channels for reproducing and reinscribing dominant ideologies and complex relationships within society (Pinar, Reynolds, Slattery & Taubman, 1995). Curriculum theorists suggest schools have become an increasingly important site for studying the reproduction of ideologies. In turn, teachers become technocrats who are accountable for reproducing and delivering a pre-packaged curriculum (Pinar, Reynolds, Slattery & Taubman, 1995). Furthermore, an examination of this discussion can lead to a deeper understanding of how the reinscription and/or subversion of UNESCO's concepts within local curriculum documents reproduce and/or resist their dominant ideologies.

What I have just described is seemingly a spiral where teachers and students lack agency. In the 1980s, however, the discussion of reproduction became intrinsically related to the concept of resistance. The influential work by Paul Willis in the 1980s showed that the "lads," who were males from working class families, challenged and resisted the ideologies embedded within the school curriculum. The root of the resistance was in the "shop floor" working-class counter-culture, which was established over generations (Willis, 2003). As I seek to understand the ways in which the Ontario curriculum document reproduces, ignores and/or directly resists UNESCO's dominant ideologies on environmental education, it is strategically essential to understand how reproduction and resistance are intertwined with the notion of ideology and curriculum as a political text.

To clarify how we might situate educational research within curriculum studies, I turn our attention to two disciplinary structures important for curriculum theorizing, which Pinar (2007) has recently termed the “verticality” and “horizontality” of the field of curriculum studies. As Ng-A-Fook (2008) summarizes, “Verticality...is the intellectual history of a discipline. Whereas “horizontality”, he continues, “refers to analyses of present circumstances, both in terms of internal intellectual trends as well as the external social and political milieus influencing the field” (p. 12). The framework of this study is based on these disciplinary structures. I study UNESCO’s historical discourse, as well as the relationship between this discourse and the discursive trends within the Ontario elementary science and technology curriculum, in order to consider the verticality of the field of environmental education curriculum. Then, I turn to postcolonial theory to understand complexities of the current situation of environmental education curriculum. This affords us an opportunity to advance our understanding of the complex relationship between global and local discursive trends related to the concept of *education for sustainable development*.

As Apple (1990) suggests, “the curriculum researcher must think structurally and relationally. He or she must link...back to the question of power and control outside the school” (p. 17). Consequently, I seek to understand how the verticality of discourse/ideologies on sustainable development intersects with the horizontality of the implication of current Ontario science and technology curriculum. Therefore, I draw on curriculum theory as I attempt to understand *what* ideologies in UNESCO’s discourse on *education for sustainable development* are reproduced and/or challenged in the school curriculum. I then utilize curriculum theory to reread the discursive trends identified within the Ontario Elementary curriculum document.

### *Postcolonial Theory*

Gough and Gough (2003) maintain, “researchers have traditionally conducted environmental education research in a “colonial and patronizing manner” (p. 2). They call for a deconstruction of Western-developed environmental education curriculum and curricular approaches because they systematically privilege science. Furthermore, such approaches promote the environment as a resource to be exploited (see Adams, 2004; Adams & Mulligan, 2003; Gough, 2003; Plumwood, 1993, 2002; Tropp, 2006). By situating my study within postcolonial theory, I am well positioned to identify and deconstruct colonizing trends within the UNESCO landmark documents and the Ontario elementary science and technology curriculum. Before providing an explanation of how I employed postcolonial theory in my (re)reading of the coded sections during phase three, let me briefly describe aspects of postcolonial epistemology which are of particular importance to this project.

Postcolonialism is concerned with the marginalizing effects of traditional dominant forces on culture, identity, and environment which persist, despite educational efforts toward decolonization (Loomba, 1998). It is the study and critique of the legacies of colonialism. Consequently, it considers the lingering impacts of colonization and processes of decolonization. Also implicated in postcolonial theory are other concepts, such as neo-colonialism. Here I situate the term *neo-colonialism* as the continued economic and cultural dependence created by the West through non-traditional means (Brydon, 2000; Moore-Gilbert, 1997; Prasad, 2003). Altbach (1995) writes that one way in which neo-colonialism is being undertaken is through sustained pressure on developing countries to focus primarily on Western science in their postsecondary institutions. This can result in the loss of valuable indigenous epistemic systems for understanding the environments in which we live. I suggest that the concept of *neo-*

*colonialism* is of interest in this research project. Education can shape neo-colonial discourse. Therefore, organizational bodies such as UNESCO can perpetuate neo-colonial ideals through their educational discourse. The notion of discourse itself is also of particular importance here. Discourse, being the process and structure through which cultural, political and economic practices of societies are produced, reproduced and/or subverted, can continue to perpetuate hierarchical structures of power established through colonization (Altbach, 1995; Gee, 2004; Prasad, 2003). I will discuss this process further in chapter six.

Consequently, I suggest that drawing on postcolonial theory helps deconstruct the process through which UNESCO's dominant discourse on environmental education is reproduced or resisted within the Ontario curriculum. A postcolonial lens provides insight into the influential powers held by UNESCO even though it is not in a position of direct rule over regional environmental education policies. Moreover, I utilize aspects of postcolonial theory to deconstruct how the disciplinary structure of environmental education (as it is informed by UNESCO's discourse on *education for sustainable development*) works to colonize our relationship with place. William Adams has written extensively on the notion of decolonizing nature (see Adams, 1992, 2002, 2003, 2004; Adams & Mulligan, 2003). In *Decolonizing Nature*, Adams & Mulligan (2003) suggests that colonization transformed nature and ecologies, which created new ideologies surrounding the human and non-human relationships. Adams' work on society's relationship with the environment as one of "colonizer" and "colonized" may provide a deeper understanding of how the discursive trends in UNESCO's landmark documents and the Ontario elementary science and technology curriculum produce, reproduce and/or subvert an ideology which objectifies our "environment" as "other."

Though I have highlighted above some of the strengths of postcolonial theory, there are also several shortcomings. Loomba (1998) warns, “postcolonialism...is a word that is useful only if we use it with caution” because “countries and societies experience postcolonialism differently” (p. 18). Furthermore, postcolonial theory has been criticized for being Eurocentric and a dominant discourse in and of itself. Despite the importance of location, which is embedded in postcolonial thought, postcolonialism is nevertheless a global phenomenon and has value as a theoretical perspective. As a result of the deep contentions surrounding the Eurocentrism of postcolonial work, the term “postcolonialism” now often refers to “postcolonial theory and criticism” (Prasad, 2002). I suggest this works in turn to strengthen the significance of postcolonialism in my research. Considering both postcolonial theory and criticism result in the inclusion of works from other perspectives, such as indigenous theory seen in Ashcroft, Griffiths and Tiffins’ (1989) *The Empire Writes Back*. However, perhaps postcolonial theory’s greatest strength as a conceptual analytical framework is its ability to defamiliarize discursive trends and afford researchers an opportunity to observe new and hidden meanings (Brydon, 2000; Prasad, 2003). In chapter six, I use this strength of postcolonial theory to deconstruct the Ontario science and technology curriculum.

In the following chapter, I explain the methodological approach which I utilized to conduct the project.

## CHAPTER FOUR: METHODOLOGY

This chapter is divided into three sections. First, I situate my utilization of the term *critical discourse analysis*. I consider the theoretical grounding of the approach and provide my rationale for selecting it as the underpinning methodology for my study. Second, I explain the selection of my primary data sources. Finally, I conclude the chapter with a detailed description of the method and techniques employed for each of the three phases of this study. Let us now consider the concept of critical discourse analysis.

### *Critical Discourse Analysis*

As curriculum theorist Ted Aoki warns us about the power of language, “the danger...is that we become the language we speak...there is no language without desire and no desire which is not itself language” (quoted by Pinar, 2004, p.25). *Critical discourse analysis* seeks to understand the role discourse plays in power relationships and inequalities embedded in society, and their underlying implications. It is rooted in critical theory and is therefore commonly used to study and explain how social problems are perpetuated through text (Fairclough, 2004). It aims to uncover ideologies that are innate and/or hidden in discourse (McGregor, 2004). A critical discourse analysis includes the explicit study of such ideologies and considers how the discourse reproduces or challenges their dominance (Rogers, 2004). It accomplishes this by seeing language as a form of social and political practice, which is tied to historical contexts and has the ability to reproduce or contest different interests (Gee, 2004; Janks, 1997). In order to better situate critical discourse analysis, let us consider the following terms independently: critical, discourse and analysis.

### *Critical*

The word *critical* indicates an approach stemming from critical theory. Though I do not draw directly on critical theory, I seek to understand concepts central to critical theory such as the reproduction and resistance of ideologies (Pinar, Reynolds, Slattery & Taubman, 1995). Scholars such as Giroux (2004) and Apple (1995) have expressed that critical theory played a fundamental role in developing aspects of curriculum theory which studies curriculum as a political text (Pinar, 2004). In this study, I situate the word *critical* as indicating an effort to establish a critical social consciousness that exposes the reproduction or subversion of dominant ideologies. This does not need to be accomplished utilizing critical theory (Pinar, Reynolds, Slattery & Taubman, 1995). Rather than drawing on critical theory, I employ curriculum and postcolonial theories to understand the reproduction and resistance of ideologies embedded within discursive trends.

### *Discourse*

Discourse is more than simply the words and language of a text (Gee, 2004; Philips & Hardy, 2002; Roger, 2004). It is the language which reflects and produces the social world and social realities, including social norms and ideologies (Foucault, 1978; Philips & Hardy, 2002). As such, it must be considered within its social, cultural and political contexts. Therefore, discourse includes not just language but how language is consumed, produced, distributed and reproduced (Rogers 2004). Furthermore, it considers the interrelation between texts (Philips & Hardy, 2002). Inherently, discourse is ideological and puts forth values and concepts at the expense of other values and concepts (Roger, 2004). Consequently, my analysis of discursive trends throughout this study is a reflection of my social self, influenced by the contexts in which I engage the discourse and my past-lived experiences.

### *Analysis*

As aforementioned, the assumption that language is socially situated and has underlying systems of meaning is crucial to the study of discourse (see Foucault 1978; Gee, 2004; Giroux, 2001; Roger, 2004). Therefore, the critical analysis of discourse must take into consideration the text as a whole, not merely individual sentences. The analysis must reflect the existing content as well as omission and gaps in the discourse. It is the analysis that works to identify and unravel underlying assumptions and expose the ideologies embedded in the discourse (Carter, 2005). I look more closely at the methods used to conduct the analysis later in this chapter.

In summary, my work does not consider all aspects which are included in the broad concept of critical discourse analysis. Most notably, my research is not grounded in critical theory. However, curriculum and postcolonial theories support my *critical* analysis of the text. Critical discourse analysis is a valuable approach for this study because it supports my analysis of how power relationships may be formed and/or reproduced and/or subverted through discourse. Furthermore, critical discourse analysis allows me to describe, interpret and explain the discourse as a reflection of my social self.

### *Data Source*

In this section I explain my rationale for my selection of the primary data source. Let us recall that during the first phase of the study I analyzed four documents that UNESCO has labelled as landmark in the evolution of its discourse on environmental education. During the second phase of the study, I analysed the Ontario elementary science and technology curriculum. I begin with an explanation of my calculated decision to choose the four landmark documents above other UNESCO documents on environmental education.

### *UNESCO Landmark Documents*

The rationale for selecting the four UNESCO landmark documents is twofold. First, these documents are considered to be of particular importance. Despite the large amount of literature produced by UNESCO, the organization has labelled these four documents as fundamental to the evolution of environmental education internationally (UNESCO, 2008). They also culminate in what UNESCO refers to as “the basis for action in Environmental Education for Sustainable Development for the years to come” (UNESCO, 2008). Both UNESCO and the scholarly literature suggest that these documents laid the ground work for the declaration of the Decade of Environmental Education for Sustainable Development (Bonnett, 2007; Gough 2003; Jicklings & Wals 2008). Second, using these documents, which range in publication from 1975 to 1992, afforded me an opportunity to focus on the discursive transformation of environmental education. Transformation and discontinuities, Foucault (1972) explains, are important for establishing foundations of knowledge production. Thus, considering the discontinuities as well as the continuities of the language within these documents provides a more nuanced understanding of the notion of *education for sustainable development* (Foucault, 1972; Moore-Gilbert, 1997).

### *Ontario Elementary Science and Technology Curriculum*

I have selected the recently released Ontario elementary science technology curriculum for three central reasons. First, the document was released in 2007 following the Ministry of Education’s assurance back in 2003 that environmental education would be addressed across all subjects and grades (Ontario Ministry of Education, 2008). Second, a Ministry-commissioned report on environmental education, *Shaping our Schools Shaping our Future*, suggests all environmental education should “rest on the foundations of knowledge from science and social

studies/geography” (p. 5). This labels science as a subject of particular importance for environmental education.

The final reason is based on the interconnection of several of my lived experiences. This has connections to both my educational and professional experiences. I conducted my undergraduate degree in civil/environmental engineering, and throughout this programme developed a particular interest in issues of sustainability from a global perspective. It was after the completion of this degree, working overseas in Ghana as an engineer, that I began to question the possibilities and limitations of a global curriculum on environmental sustainability. These professional and educational experiences helped to shape my scientifically grounded understandings of environmental and sustainable development issues.

Furthermore, I completed my Bachelor of Education in the primary/junior division, which has provided me with a familiarity of reading curriculum for elementary years. In addition, I have started an environmental club for students at the elementary level, providing me with insight as to how this age group views environmental issues and interacts with their environment. The interconnection of my lived-experience resulted in my gravitation toward the Ontario elementary science technology curriculum.

Despite the possibilities provided by my familiarity with the subject at hand, I realize that it may narrow my analysis. My previous experiences might lead to several preconceived notions on environmental education, whether conscious or unconscious. I suggest, however, that this possible limitation is overcome, at least in part, by employing a postcolonial (re)reading to my initial analysis. I describe this (re)read of my initial findings as well as provide a detailed explanation as to how I conducted my initial analysis in the following section.

### *Analysis of Text*

In this section, I provide an outline of the strategies employed during the respective phases of my research. In keeping with critical discourse, I analyzed the texts of the four fundamental UNESCO documents and the Ontario science and technology curriculum, to identify patterns and anomalies (Fairclough, 2004). These are what I refer to as discursive trends. I worked within the notion of reflectivity, which considers that language can both create and reflect the context in which it is used (Gee, 1999). I utilized postcolonial and curriculum theories as a methodological filter for analyzing and deconstructing the meaning of the discursive trends. In turn, my analysis suggests how the documents at hand may inform our understanding of the curricular processes for standardizing environmental education discourse. Next, I provide a detailed explanation of how I conducted my analysis.

I reviewed the UNESCO documents during the first phase of the study to gain an understanding of how the concept of *education for sustainable development* materializes. I began my analysis with an open coding strategy to afford ideologies associated with *education for sustainable development* an opportunity to emerge from the discourse. Employing this strategy enabled me to analyze the texts for both patterns and single instances of meaning, from which key concepts and ideologies were then drawn (Creswell, 2007; Emerson, Fretz & Shaw, 1995). Nevertheless, I utilized a number of questions to guide the coding. I still consider my approach to be open coding as these questions do not work to identify any particular ideology or concepts; rather, they help identify ideologies in general (Creswell, 2007; Hamersley & Atkinson, 1997). The questions that follow were developed from the aforementioned situated meaning of *ideology* in chapter three:

- How is the environment viewed? What assumptions are evident?
- What common sense and/or natural representations of the environment are present?
- What type of relationship among society and the environment is promoted/established?
- Are there any constraining and/or prescriptive characteristics associated with society's relationship with the environment?

As I read and (re)read each document, continually revisiting these guiding questions, I identified sections of the texts that emerge as indicating a trend and/or single instance of meaning. My findings for each landmark document were then organized into a table with the following column headings: phrase/text identified; reason for identification; possible meaning or ideology associated with text; and additional notes (for example, consider table 4.1.).

Table 4.1  
*Coding of Intergovernmental Conference on EE 1977*

Phrase/Text Identified	Reason for Identification	Possible Meaning or Ideology Associated with Text	Additional Notes
The development of environmental education constituted an ideal field of action for regional and international cooperation, since the unity of purpose of all peoples and of all governments is necessary in order to forestall and solve environmental problems. (p. 7)	Assumption that unity is necessary.	Implies there should be unity in action.	

This format allowed me to follow the discursive trends as well as provided me with a space to track my social construction of these trends and the key concepts which I identify.

From these initial tables, the following seven topics emerged as having significant meaning: 1) concept of the environment; 2) aim of environmental education and education for sustainable development; 3) approach to environmental education and education for sustainable development; 4) concept of development; 5) role of individuals; 6) role of the collective; and 7) ethics and culture. In order to better trace the genealogy of these topics, I created a table for each

with a separate column for every UNESCO's document in chronological order (for example, see table 4.2).

Table 4.2

*Summary of Coding Relevant to the Aim of Environmental Education and Education for Sustainable Development*

Belgrade Charter	1977 Report	1987 Report	Agenda 21
The goal of environmental education is: To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.	Environmental education should also promote attitudes which would encourage individuals to discipline themselves in order not to impair the quality of the environment and to play a positive role in improving it.	Environmental education (EE) is regarded as a permanent process in which individuals and the community gain awareness of their environment and acquire the knowledge, values, skills, experiences and also the determination which will enable them to act - individually and collectively - to solve present and future environmental problems.	Programme areas described in the present chapter are: (a) Reorienting education towards sustainable development; Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.

Next, I summarized the evolution of each of these topics. In order to construct further meaning from the seven topics, I reviewed the literature in related areas simultaneously. Much like a complex system, this process was not fixed or clearly defined but was open and continually developing (Davis & Sumara, 2006). The process affected both how I read the literature and how I constructed meaning from the coded sections of the UNESCO documents. Drawing on Davis's (1996) concept of co-emergence, the construction of meaning from the UNESCO discourse and the literature review was based on the two being bound together. From this process I reduced the seven topics to three overarching concepts key to understanding UNESCO's concept of *education for sustainable development*: 1) the predominant purpose of schooling; 2) the perception of place; and 3) the role of Western-scientific knowledge. I traced how the ideologies, which I perceived to be associated with each of these concepts, evolved over UNESCO's historical discourse in relation to the term *environmental education* and *education for*

*sustainable development*. Understanding these ideological differences throughout the discourse led to a more nuanced understanding of both the terms at hand. I elaborate on my findings in chapter five where I discuss both the relevant section of the literature, and the key concepts and the ideologies I associate with each.

The coding of the Ontario elementary science technology curriculum document, the second phase, was conducted utilizing a slightly different approach. Though I continued to use open coding to identify new themes and emerging concepts, I also employed what is referred to as selective or focused coding. In doing so, I analyzed the curriculum document for the key concepts and ideologies, which were identified during the first phase (Creswell, 2007; Emmerson, Fretz & Shaw, 1995). Creswell explains that during selective coding the researcher reviews the text for previously-established concepts.

I began my analysis by creating a summary page for the three key concepts previously identified to guide my coding of the curricular text. Next, I read and reread the curriculum, coding sections of that text which I identified with the previously established key concepts and ideologies (see table 4.3).

Table 4.3

*Coding Table for Ontario Elementary Science and Technology Curriculum*

Text from Curriculum	Selected Coding Key Concept	Additional Notes	Location of Text
An entire page dedicated to the importance of skills and assessing skill. There is no equivalent for knowledge.	Purpose of education – this may indicate a tendency toward the training and workforce end.		Pre-amble p. 12

From the coded text I made tables for each of the key concepts. I read and reread these tables against the scholarly literature and my analysis of the UNESCO documents to identify trends and related ideologies.

In the third and final phase, I reread the key concepts, which emerged in phase one and two, and the ideologies associated with each utilizing a postcolonial lens. I began by reviewing postcolonial literature on the three key concepts. Then I drew on both the postcolonial literature and the previously coded sections of text to deconstruct the key concepts and the ideologies I perceived to be associated with each in UNESCO's discourse and the Ontario elementary science and technology curriculum document. The method of deconstruction which I employed identifies underlying assumptions and unravels the discursive trends to expose the presence of colonizing beliefs or tendencies (Carter, 2005). I further situated the concept of deconstruction in chapter six alongside its employment. In turn, this postcolonial deconstruction works toward understanding the colonizing and/or decolonizing trends within the discourse.

My analysis, conducted as I have just described, is discussed in the following chapter. The ideologies which I associate with *education for sustainable development* are explained in detail and the complexity of the discourse emerges.

## CHAPTER FIVE: ANALYSIS OF DISCOURSE

This chapter presents the analysis of both UNESCO's historical discourse and the current Ontario elementary science and technology curriculum. The chapter is divided into three parts. First, I provide a review of scholarly writing related to concepts that I identified in my coding of the UNESCO documents. As I mentioned in chapter four, the literature reviewed was influenced by my open coding and it itself influences the meaning I construct from my coding. The literature review is inextricably linked to my analysis and is therefore included in my analysis chapter. In the second and third sections, I work toward unravelling the first two research questions:

- What ideologies are developed by UNESCO's historical discourse on *education for sustainable development*? and;
- How do the discursive trends represented within the Ontario elementary science and technology curriculum work to reinscribe and/or subvert UNESCO's historical discourse on the concept of *education for sustainable development*?

I consider the genealogy of the term *education for sustainable development* within the context of UNESCO's discourse, and how its meaning intersects with the present Ontario curricular discourse. The second section considers the verticality through a genealogical study of the term *education for sustainable development* within UNESCO's landmark documents. In the third and final section, I consider to what extent the Ontario elementary science and technology curriculum reinscribes and/or subverts UNESCO's historical discourse on the concept of *education for sustainable development*. I analyze the Ontario elementary science and technology curriculum document, looking for the specific ideologies identified within UNESCO discourse. Before delving into these sections, however, I provide an overview of my findings and review the important concept of "ideologies."

I would like us to return momentarily to a statement made in chapter three. I suggested that ideologies are shaped by and shape the relationship between people and the material world. Ideologies are thus socially constructed (Giroux and Trend, 1992). As a researcher, I carry my lived-experiences with me. Consequently, my (re)reading of the discursive trends, and the respective ideological analysis I (de)construct, are themselves a reflection of my social self, influenced in turn by my relationships with the world around me. Therefore, the analysis is always contextually situated by my lived experiences and my findings remain, as Greene (2008) tells us, “partial.”

The open coding of UNESCO’s historical discourse reveals specific key concepts which help us to understand its concept of *education for sustainable development*. These key concepts include: 1) the predominant purpose of education; 2) the perception of place; and 3) the role of Western-scientific knowledge. In this chapter, I trace the evolution of these concepts through the four landmark documents and identify how the discursive trends (re)produce the ideologies associated with each one. More specifically, I discuss the shifts which occur in these ideologies. I focus on points within the discourse where the term *sustainable development* emerges. Before introducing the ideologies associated with the three concepts, I briefly draw our attention back to my initial analysis of the UNESCO documents to review where this transition from *environmental education* to *education for sustainability* occurred.

The term *sustainable* is introduced for the first time in the 1987 report, which is the third of the landmark documents. However, it is not until the fourth landmark document, *Agenda 21*, that the term *education for sustainable development* is utilized and a decisive call is made to reorient *environmental education* toward *education for sustainable development*. Therefore, my analysis focuses foremost on the shifts in ideologies associated with the three key concepts that

occur at two specific places within the historical discourse of the landmark documents. The first is between the second and third documents where the term *sustainability* is introduced. The second is between the third and fourth documents when the term *education for sustainable development* emerges.

At this point, providing an overview of the ideologies I identify and associate with each key concept is difficult. They are complex and my construction of these ideologies requires a detailed explanation. However, Table 5.1 provides a preliminary glimpse at the types of ideologies which surface from my analysis.

Table 5.1  
*Trends in the Predominant Ideologies Associated with Key Concepts*

Concepts	1975 Document	1977 Document	1987 Document	1992 Document
Perceived Predominant Purpose of Education	Cultural (re)production	Cultural (re)production	Cultural (re)production/ Efficient workforce	Efficient workforce
Perception of Place	Non-place-responsive	Non-place-responsive	Place-responsive	Place-responsive
Role of Science	Absence of science	Interdisciplinary – Science is present in balance with other disciplines	Interdisciplinary – Some additional emphasis on science	3 Pillars – Economics, social, and science

The left column of the table indicates the key concepts. These concepts were not predetermined. Rather, they were identified through the open coding approach explained in chapter four. The next four columns represent the predominant ideologies I perceive to be associated with the respective concepts in each respective UNESCO document. For example, the “perceived predominant purpose of education” in the first two documents is grounded by ideologies of *environmental education*, serving the primary purpose of producing and reproducing cultural norms, values and behaviours. However, the ideologies associated with the predominant purpose

of environmental education begin to shift in the 1987 document. In this document schools are, in several instances, referred to as sites that serve the central purpose of establishing a productive workforce. This trend continues in the 1992 document where the discourse no longer indicates cultural production and reproduction as a central target of schooling associated with the term *education for sustainable development*. I now look more closely at each of the key concepts.

### **Literature Review on Key Concepts**

The key concepts introduced, as mentioned, are complex. It is difficult to discuss and understand the nuances of a concept such as the perceived purpose of education without addressing the academic literature. For this reason, I have included a short review of the scholarly writing on each of the key concepts prior to my discussion on how the concept and related ideologies emerge throughout the UNESCO documents. I have chosen to place this additional literature review in the analysis section of the study for the following reasons. The concepts at hand were identified during, not prior to, the coding of UNESCO's landmark documents. It was therefore following the identification of these concepts that I reviewed the literature to further inform my interpretation of the data. As a result, this literature review is not only part of the methodology I employ for reading the UNESCO and Ontario curriculum documents, but it is also inextricably linked to my social construction of the emergent concepts and their related ideologies. By providing a summary of the literature immediately before my explanation of the key concepts, the reader can trace how my analysis informs my selection of additional literature, as well as how the literature then informs my analysis. In the case of the last two key concepts, the literature builds on the initial literature review provided in Chapter two. However, the concept of the perceived purpose of schooling did not emerge in the initial review

of scholarly literature on environmental education, which is where I begin my review of the literature.

### ***Perceived Purpose of Schooling***

Through my analysis I perceived a difference between the purpose of schooling related to the historical discursive trends of the terms *environmental education* and *education for sustainable development*. This in turn led me to consider the complexities of the underlying beliefs and values connected to the purposes of education. The literature in this area maintains that the purpose of education is neither ideologically or politically neutral (Giroux, 1990). The ideologies surrounding the purpose of education and schooling are tied directly to social, political and economic contexts, and consequently remain in continual flux (Chambers; 2003; Jickling, 2008). In this section, I provide a separate summary for the commonly discussed purposes of schooling, cultural and economic production. I am not suggesting that in any given situation schooling can be reduced to having only one sole aim. Rather, the purpose of schooling is both informed by and reproduces multiple ideologies shaped through continually changing political, economical and cultural factors. However, frequently one ideological aim dominates over others through curricular discourse utilized within the organization of schooling. This can result in the perception of a sole, or at least predominant, purpose.

“In some cases,” Giroux (1990) tells us, “school curriculums have been fashioned in the interest of an industrial psychology that attempts to reduce schools and learning to strictly economic and corporate concerns” (p. 363). This ideological approach, he maintains, may cause schools to increase school-business partnerships. In particular, there may be substantial business involvement in educational reform as attempts are made to create a stronger connection between schools and the work world. O’Sullivan (1999) describes in greater depth the underlying beliefs

and values of such an approach through his analysis of Ontario's historical educational discourse. He suggests that a global economic competitive paradigm, which utilizes schooling to build human capital for increasing national productivity, frequently emerges in periods of fear and instability. The belief underpinning this approach is that schooling serves as a crucial channel for economic development. The following statement made by the Canadian Manufacturing Association encapsulates such beliefs: "the competition of the world has become so strong that we cannot afford to fall behind in the race for efficiency...Technical education must come...we must educate our people toward efficiency" (p. 312). Here, the primary value of schooling lies in its ability to ensure employability and create competent workers who contribute to economic growth. Though this statement made in the early 1900s is dated, these underlying beliefs about schooling's purpose are still common. For instance, as the World Bank strives to promote global stability, its documented policies and strategies promote a form of schooling which is foremost a means to generate a productive labour force (Robertson, 2005).

Alternatively, Giroux (1990) suggests, curriculum can focus predominantly on developing schooling as a site for cultural production. This underlying purpose of education places the insurances of employability second to developing deemed important cultural values. Curriculums, he explains,

*...are being developed around the cultural imperatives of selected versions of the so-called Western civilization. In this view schools take on a decidedly different role; rather than being defined as vehicles for economic reform, schools become sites of cultural production and their purpose is redefined through the imperatives of providing students with the language, knowledge and values necessary to preserve the essential traditions of Western culture. (p. 364)*

Considering the notion of cultural production helps us to understand the beliefs and values associated with this approach. Willis (1981) maintains that cultural production occurs when new

attitudes and beliefs, which provide sufficient bases for decision-making, are experienced by a generation, group or person. Tikly (2001) succinctly describes the employment of schooling for this gain as “using education as a principle means to forge unity and a common citizenship” (p. 153). Reflecting on my personal experience, I find this approach to be particularly relevant when discussing environmental education. I have developed an environmental education program both in an elementary school and at a summer camp. In both cases, the aim was to develop environmentally responsible citizens.

Cultural *reproduction* occurs when these attitudes and beliefs become subjectively inhabited in future generations. If the primary purpose of schooling appears to be cultural (re)production, it is based on teaching students to adapt rather than to question basic precepts of society (Willis 1981). Apple (1979) suggests that the concept of schooling in and of itself leads to cultural production and reproduction, regardless of its context. Althusser (1971) maintains that schools are the “dominant ideological State apparatus” used to diffuse dominant ideologies through society. This then leads to the complex concept of hegemony, which I explore further in the next chapter. Many scholars such as Althusser (1970), Apple (1979) and Foucault (1978) argue that schooling always reproduces certain ideologies regardless of the stated aim of the stakeholders. However, as mentioned earlier, I suggest that certain underlying ideologies can be more prevalent than others, resulting in differing *predominant* purposes associated with schooling, where cultural (re)production or economic growth are but two possibilities.

Jickling and Wals (2008) discuss two different approaches to schooling: *transmissive* and *transformative* education. Schooling that acts within a transmissive ideological framework aims to produce individuals who work efficiently and conform to hierarchical social structure (Jickling & Wals, 2008). Such an approach is a closed process in which information flows in one

direction only from the teacher to the student. They can be described as “[the] transmission of facts, skills, and values to students” (Jickling & Wals, 2008, p. 7). I suggest that the two central purposes of schooling discussed by Giroux, namely cultural and economic production, are subcategories of transmissive education. Both have similar grounding in the beliefs and values associated with transmissive education, primarily the importance of developing social reproduction and economic efficiency.

In opposition to transmissive educational ideology is what Jickling and Wals (2008) term *transformative education*. This approach is based on the belief that the purpose of schooling is primarily to produce individuals who question societal norms and are active in ongoing decision-making within society (Giroux, 2001; Lucas, 2002). Knowledge and understanding are co-constructed within the social context. In turn, value is placed on learning from prior knowledge, lived experiences and diverging cultural perspectives (Jickling & Wals, 2008).

In this section and throughout the discussion of my analysis which follows, I strategically essentialize the purpose of education in to the binaries of transmissive and transformative, and within transmissive into the binaries of cultural production and economic production. As I explain later binary thinking can work to re-affirm aspects of colonialism. However, strategic essentialism can be beneficial if used to obtain specific goals (Tikly, 1999). Here, simplifying the complex ideologies underpinning purpose of education in to binary groupings allows me to clearly explain the dominant trends within the discourse, which I do later in this chapter.

### ***Concept of Place***

The concept of place was identified in the initial literature review as an important aspect of environmental education (see Apple, 1979; Bell & Russell, 2002; Bonnett, 2007; Mulligan and Adams, 2003). In this section I build on this previously reviewed literature to gain a more

nuanced understanding of how one constructs a connection with place. Place is deeply interconnected with identity and culture (Ashcroft, 2001; Gruenewald, 2003a; Massey, 1993). Simply stated, “people make places and places make people” (Gruenewald, 2003, p.621). Consequently, this social construct has multiple underlying ideologies, some of which are influenced by, and emerge from educational discourse (Gruenewald, 2003). Place is also deeply interconnected with politics and economic aspects of society. Williams succinctly represents this as: “place + people = politics” (Williams, as cited in Gruenewald, 2003). Therefore, we cannot consider place to be solely the space which we occupy.

The interconnectedness of the political, social and ecological aspects of place has moved to the forefront of conversations provoked by environmental educators and environmentalists (Bowers, 2004; Gruenewald, 2003a; Gruenewald, 2003b; Mulligan and Adams, 2002; Plumwood, 2000; Orr, 1994). These scholars suggest that reversing environmental degradation requires serious rethinking of the ways in which societies perceive the places they inhabit, which in turn requires changes to formal education. “Reordering the idea of place in our mind requires,” Orr (1996) stresses, “reordering educational priorities” (p. 163). He and others call for *place-responsive* educational reforms, which would incorporate an approach centred on the importance of one’s place in their environment (Warren, 2000). The notion of place in this context simplistically means a bond between one’s mind and nature (Orr, 1994). Plumwood (2002) provides a more nuanced description of place:

Space becomes place not only through its human but also through its non-human inhabitants.

Without the richness of narratives and narrative subjects that define and elaborate place, the connection between our lived experience and our sense of space and time is reduced, and life lacks immediacy, becomes flat, impersonal and placeless. Place loses agency along with salience, and

places themselves become interchangeable, irrelevant and instrumentalisable, neutral surfaces upon which 'rational' human projects can be inscribed. (Plumwood, 2002, p. 231)

Therefore, place-responsiveness is thought to be developed through fostering a localized relationship with one's surroundings rather than the understanding of a set of physical characteristics (Cameron, 2003).

Perhaps one way to clarify what is meant by a place-responsive approach is to consider what it is not. A place-responsive curriculum differs from the once highly regarded idea of "think globally; act locally," which was coined in 1972. Despite this approach's popularity in the 1970s and 1980s, scholars now believe that a global focus impedes a connection with place, as it tends to reduce the earth to a set of abstract concepts that distorts the consequences of environmental degradation (Orr, 1994). Now prominent figures such as Suzuki (2004) are urging society to "think locally; act locally; to make a difference globally" (April 14). I will elaborate on these ideas further throughout the analysis of the UNESCO documents, which reveals an increasing connectedness with place in conjunction with the emergence of the discursive trends associated with *education for sustainable development*.

### ***Science-Based Environmental Education***

In subject-based curricula the primary location of environmental education is frequently in science courses (Gough, 2008; Palmer, 1998). As was indicated in my initial literature review, this is continually problematized by both curriculum and environmental education scholars (Bowers, 2004; Gradle, 2007; Hewson 1988). The literature shows that even when environmental education does appear in other subjects' curriculum, the content is often still grounded in scientific knowledge (Bowers, 2004; Palmer 1998). Palmer's (1998) research indicates that "this situation is very apparent in many locations around the world" (p. 98). In

Ontario there is evidence of this approach. As mentioned earlier, the Ministry commissioned report, *Shaping our Schools Shaping our Future*, recommends that environmental education “rest on a foundation of knowledge from science and social studies/geography” (p. 10). The scholarly literature indicates three common characteristics of science-based environmental education, which I discuss below. In turn, I utilize these characteristics to inform and construct a more nuanced analysis of the coded sections of text from the UNESCO documents.

The first characteristic of a science-based environmental education is a curriculum that neglects the complex interconnection between social, economic and political factors central to many environmental issues (Palmer, 1998). Instead, environmental issues are only presented through the lens of science. Adams and Luitel (2008) maintain that science is commonly presented to students through controlled experiments within the boundaries of the classroom wall. Science thus becomes an isolated subject which is seen to have limited influence from other disciplines or aspects of society. Apple (1979) warns that science curriculum fails students by its frequent disregard of the political, economic and cultural pressures driving scientific advancements beyond the classroom walls. He writes, “science is competitive, controversial, and political but this side is not addressed in schools” (p. 90). He continues that the disagreements, controversy and interwoven power relations are important but the curricula have not permitted students to see these aspects of science.

In terms of environmental education, this narrowness of science curricula ignores the deep political and social dimensions involved in ecological problems and their respective solutions (Gruenewald, 2004a). For example, in response to the looming concern of global warming, our provincial and federal governments are introducing new energy policies and programs. There have been a number of incentive programs put forth by the federal government

to encourage the use of biofuels (Ripley, 2008). An understanding of the benefits resulting from a shift toward biofuels, in terms of reducing greenhouse gases, can be explained through scientific knowledge. However, many argue that the ethanol biofuel incentives are not an environmental policy but rather an agricultural policy (Forge, 2007). The policy has resulted in a significant increase in demand for the farming of corn in several regions of Canada, for example. Thus, there are a number of social and political factors that influence, complicate and drive the decisions in regards to this “greener” fuel. If the social and political aspects of science are continually absent from the curriculum, students may lack the ability to approach environmental problems holistically (Bonnett, 2007; Gruenewald, 2003a; Ross, 2007). This leads us to the second characteristic, which also results from this narrow perspective.

The second characteristic is one which I experienced firsthand during my post-secondary education. In a five-year civil/environmental engineering program, I was only afforded the opportunity to take one course which led to any discussion remotely challenging the assumption of the forward direction of science. According to the literature, the absence of such discussions is common in science education (Orr, 1994; Phelan, 2004; Ross, 2007). This leads to the taken-for-granted-status of science, which suggests that science is always linked to progress in a forward direction (Apple, 1979). Carter (2003) suggests that, through formal education, we have been socialized to trust that scientific “advancements” benefit all members of society. Consequently, the hidden curriculum resulting from continually putting environmental education within science curriculum leads to the perception that scientific developments can provide the required advancements to solve all our environmental concerns (Gruenewald, 2004a).

To provide an example of this second characteristic I return again to the use of biofuels. Research has shown that a scientific advancement, which enabled higher ethanol content in fuel,

can reduce greenhouse gas emissions. However, I suggest this is a situation where society has first turned blindly to science, failing to consider solutions which are not seen as “advancements.” For instance, the municipal, provincial and federal governments here in Canada are to no significant extent considering incentives to promote social changes that can have similar results. Insignificant funding has been provided to develop transit infrastructure and intercity rail lines that could lower greenhouse gas emissions simply by reducing the number of cars on the road, through technology that already exists.

I suggest that a powerful way to challenge assumption of the forward direction of science is through discussing environmental issues in a variety of disciplines other than science, such as language arts. More specifically, I suggest that drawing on literary works of science fiction and/or speculative fiction can be a valuable tool for questioning the direction of scientific advancements in society. For example, in *Oryx and Crake* Margret Atwood writes of the possible devastating effects of genetic engineering. A novel study of such a work has the potential to lead to critical discussion on the impacts scientific advancements can have on society.

The third characteristic of environmental education based in science curricula is the undermining of cultural diversity (Bowers, 2000). Western-science has traditionally excluded local epistemological beliefs and neglected culturally contextualized learning (Adams and Luitel, 2008). In turn, this creates an affront against the important ecological principle of nature - that of diversity (Bowers, 2000; Orr 1994). By limiting the lens through which we are taught about nature, the hidden curriculum devalues diversity. I later use these three characteristics to explain that neither UNESCO’s concept of *environmental education* or *education for sustainable development* is based solely in science.

## Analysis of UNESCO Landmark Documents

In the following section, I explain how these key concepts emerged from my analysis providing a samples section of coded text. Drawing on the literature review provided above, I discuss the ideologies I perceive within UNESCO's discourse associated with each of the key concepts.

### *Purpose of Education*

I suggest that transformative education is absent from UNESCO's discourse. Instead, the discourse promotes transmissive education, shifting from the primary purpose of cultural production to economic production as *education for sustainable development* emerges. First, I present the 1975 and 1977 documents, followed by the 1987 and 1992 documents. I utilize this division to emphasize the major shift in ideologies I perceive between the 1977 and 1987 documents.

### *1975 and 1977 Documents – Cultural Production*

In the first two landmark documents, schooling is proposed as a means to create and shape a new global environmental culture. In the introduction of the short four-page Belgrade Charter, UNESCO asserts, "We need nothing short of a new global ethic," which UNESCO indicates is the responsibility of formal education. This ethic is described in the Belgrade Charter as:

Attitudes and behaviour for individuals and societies which are consonant with humanity's place within the biosphere; which recognizes and sensitively responds to the complex and ever-changing relationship between humanity and nature and between people (p. 1)

My reading of this statement is that UNESCO aims to shape specific values and beliefs which provide sufficient bases for decision-making. As explained in the literature review, this indicates the practice of cultural production (Giroux, 1990). Moreover, the role of *environmental education* is explicit here:

The reform of educational processes and systems is central to the building of this new development ethic. (p. 2)

This form of influence is the crux of cultural production (Apple, 1990; Willis, 1981).

The language associated with this ethic is prescriptive and stated with authority. For example, the Belgrade Charter maintains the following:

Millions of individuals themselves need to adjust their own priorities and assume a personal and individualized global ethic – and reflect in all of their behaviour a commitment to the improvement of the quality of the environment and of life for the world's people. (p. 2)

Here, there is no apparent call for students to question and critically discuss even the root cause of the environmental problem and/or the potential benefits of adopting a new set of ethics. For me, this signifies that autonomy and self-determination on behalf of the learner, which are both perceived as important in the transformative approach to education, are not highly valued (Jickling, 2008). These recommendations do not foster schooling that cultivates understanding and/or the questioning skills required for students to become engaged in the decision-making process. Therefore, considering both my analysis of the document and scholarly literature, transformative education is absent from the discourse. The underlying approach to schooling promoted through UNESCO's discourse in the first landmark document aligns *environmental education* with transmissive education and, in particular, the view that schooling's purpose is to be predominately aimed at cultural production.

My analysis of the second landmark document indicates that the connection between *environmental education* and cultural (re)production is maintained through the discursive trends. Evidence of this is seen in the continued prescription of environmental values, which both individuals and societies are asked to blindly adopt. For instance, this can be seen by examining the report's three primary goals of *environmental education*:

The goals of environmental education are:

- (a) to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- (b) to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- (c) to create new patterns of behaviour of individuals, groups and society as a whole towards the environment. (p. 25)

Here we see that an entire goal is dedicated to “create new patterns of behaviour of individuals, groups and society as a whole towards the environment” (p. 26). This section of text suggests an attempt to construct and control behaviour through the process of formal schooling. This aim and approach to environmental education is seen throughout the document including in the summary of the Director of the United Nations Environment Program’s address to the conference.

Paraphrasing his words the introduction of the document states:

Environmental education should also promote attitudes which would encourage individuals to discipline themselves in order not to impair the quality of the environment and to play a positive role in improving it. (p. 6)

Nevertheless, I do note a shift in the discursive trend between the first and second landmark documents. Unlike in the Belgrade Charter, I identify the presence of a problem-based approach to *environmental education* in the 1977 document. Indication of such an approach is sprinkled throughout all sections of the report. For example, in the paragraphs introducing the conference’s

Declaration of Recommendations the following statement is made:

Environmental education should involve the individual in an active problem-solving process within the context of specific realities, and it should encourage initiative, a sense of responsibility and commitment to build a better tomorrow. (p. 24)

However, there seems to be a lack of confidence in the promotion of this approach as it is only mentioned sporadically throughout the report. Furthermore, the overall nature of this approach

still fails to encourage autonomy or the construction of values associated with transformative education. The recommendations neglect any critical evaluation of societal norms. Instead, the problem-solving approach appears to be measured and retains the underlying assumption that behaviours should be prescribed through education, not constructed through given contexts and lived-experiences. For example, the document asserts:

Education should help to shape the behaviour required of all. (p.8)

The definitive language suggests the assumption has been made that schools are to serve the overarching purpose of cultural (re)production.

### *1987 and 1995 Documents – Education for Economic Production*

The transmissive educational assumptions and cultural production are again evident in the third landmark document. Two new phrases appear, “environmental culture” and “ecological culture.” These phrases are utilized to call for an univerealized set of beliefs. For example consider the following:

Owing to the magnitude of the conceptual, educational and institutional changes necessitated by the univerealization of a new ‘environmental culture’, and in view of the problems newly created by human action on the environment, the efforts already made must be continued and intensified through the adoption of such measures as will enhance their effectiveness and their relevance. (p. 4)

My perception of this language indicates a deepening of the belief that *environmental education* is in large part a means of influencing cultural (re)production. Moreover, the report advises:

There still remain substantial needs when one considers that the objective should be the creation of a genuine mass culture in respect of the environment, that is to say, a culture that is shared by all sectors of the population and by the majority of countries. (p. 15)

This new standardized culture connected to *environmental education* provides further evidence of a discourse which infers the purpose of schooling and education is rooted in cultural production.

However, despite the aforementioned trend, simultaneously language is introduced which indicates the use of schooling for economic production. The shift implies that schooling on environmental issues is also valued by UNESCO as a means of producing an efficient and skilled workforce. One of the first indications of this shift is three sections of the report dedicated to the topics titled, “Training of Personnel” (p. 12), “Technical and Vocational Training” (p. 13) and “Specialist Training” (p. 17). This new trend in the discourse is closely connected to the introduction of the phrase *sustainable development*, which appears frequently for the first time in the 1987 document. More specifically, I note a direct link between “sustainable development” and technical and vocational education and training. The term occurs frequently in the previously mentioned sections dedicated to the topic of practical education and training. For example in the Technical and Vocational Training section it suggests the following:

The reinforcement of environmental education in technical and vocational education should be a major priority for improving the quality of the environment in the context of sustainable development. (p. 14)

Vocational education in the past has been supported, by both the World Bank and OCED, as a way to establish economic competitiveness through improving the skilled workforce (Bennell & Segerstrom, 1998). Consequently, vocational and technical training are grounded in the ideological assumptions that schools are to have a strong connection with the work world (Lauglo, 1996; Leach, 2000). UNESCO’s link between *sustainable development* and developing an efficient labour force does not end with its connection to vocational and technical curriculum.

In the 1987 report, there is also an entire section dedicated to discussing “specialist training” in which multiple references are made to *sustainable development*. For instance, it calls for international bodies to:

Make increased efforts, particularly in the developing countries, to train a sufficient number of high-level personnel to ensure sustainable development and economic growth. (p. 18)

I suggest that this quote signifies the belief that education plays a central role in driving economic growth.

I also perceive that, as the term *education for sustainable development* becomes increasingly prevalent in the discourse of *Agenda 21*, so too does the implications that schools are valued first and foremost as sites to develop a productive workforce. This final landmark document considers “training” to be one of three major thrusts of *education for sustainable development*, thus dedicating two pages to this topic in a document only seven pages in length. Furthermore, the reorientation of education toward sustainable development calls for:

Special emphasis to the further training of decision makers at all levels. (p. 2)

In turn, the employability focus of education connected to training is affirmed as:

... one of the most important tools to develop human resources and facilitate the transition to a more sustainable world. It should have a job-specific focus, aimed at filling gaps in knowledge and skill that would help individuals find employment and be involved in environmental and development work. At the same time training programmes should promote a greater awareness of environment and development issues as a two-way learning process. (p. 5)

This diverges from the central focus placed on developing values and attitudes promoted through a “global ethic,” seen in the first two landmark documents. For further evidence, I draw attention to the four following objectives of reorienting *environmental education* toward *education for sustainable development* through training programs:

- 1) To establish or strengthen vocational training programmes that meet the needs of the environment and development;
- 2) To promote a flexible and adaptable workforce;
- 3) To strengthen national capacities, particularly in scientific education and training; and
- 4) To ensure that environmental and human ecological considerations are integrated at all managerial levels. (p. 5)

In these curricular objectives, there appears to be a direct relationship forming between schools and the work world. As suggested in the aforementioned literature, this approach indicates that the primary value of schooling is to ensure employability and contribute to economic growth (Giroux, 1990; O'Sullivan, 1999). Moreover, these objectives reveal a lack of value in transformative education. Objective two calls for flexibility and adaptability, which implies the promotion of compliance. The co-construction of knowledge and critical thinking leading to well-grounded opinions and decision-making, the foundation for transformative education, is absent from the discourse.

#### *Summary of the Perceived Purpose of Education*

The trends in the predominant role of education, with regards to *environmental education* and *education for sustainable development* discussed in this section, are merely tendencies toward one belief or another. In all documents there is a range of contradicting assumptions made with regards to the purpose of education. Nonetheless, I have focused on what I have coded/identified as the dominant discursive patterns and transformations. The tendencies discussed above lead to the following conclusion. Both UNESCO's concepts of *environmental education* and *education for sustainable development* are grounded in transmissive education. Its concept of *environmental education* is founded on the ideology that schooling's primary role is that of cultural production. On the other hand, *education for sustainable development* appears based on the ideology that the purpose of schooling is foremost to create an efficient workforce and drive

economic production. This ideology emerges as utilizing schooling for cultural (re)production fades from the discourse. The change occurs simultaneously with the appearance and prevalence of the term *education for sustainable development*. Furthermore, the shift suggests UNESCO's discourse follows the noted historical educational trend that during periods of economic decline or uncertainty education tends to become fixated on producing a competitive and efficient labour force (O'Sullivan, 1999). The International Monetary Fund statistics recognize both the early 80s and early 90s as periods of global economic slowdowns (International Monetary Fund, 2009). Thus, one explanation for the shift in UNESCO's ideological underpinning of the purpose of education may be the ebbs and flows of the global economy.

### ***Notion of Place***

Place emerges as a key concept through two shifts in UNESCO's historical discourse. First, the initial "global" approach to environmental issues fades from the discourse and local consideration becomes increasingly prominent. Second, the individual behaviour encouraged in the 1975 and 1977 documents is overshadowed by the introduction of collective actions, such as community driven initiatives. The coding indicates that these shifts correspond with the introduction of the terms *sustainability* and *education for sustainable development*.

### ***1975 and 1977 Documents – Thinking Globally***

The first two landmark documents promote an environmental education strategy which supports a broad global scope of the issues at hand. The disclaimer, which leads into the Belgrade Charter, indicates the belief that we should work toward a global approach to environmental education:

Adopted unanimously at the close of the 10-day workshop at Belgrade was a statement, subject to modification by subsequent regional meetings, of the framework and guiding principles for global environmental education, which became known as the Belgrade Charter. (p. 1)

Then, the body of the Belgrade Charter asserts simply:

Environmental education should examine major environmental issues from a world point of view.

(p. 4)

Moreover, this document's primary focus appears to be on developing one global programme.

This is evident in following statement:

It is within this [report's] context that the foundations must be laid for a world-wide environmental education programme. (p. 2)

In addition, local actions are, for the most part absent from the discourse.

In the 1977 document, local considerations are introduced and frequently considered, but the underlying belief remains that action to protect the environment and reverse degradation will only be effective if they stem from a global perspective. Global environmental issues/problems are the focus of global and local action. For example, this is illustrated in the following quote:

In these times, when the entire planet has become the setting for human activity, the global and many-sided character of the problem of controlling the quality of the environment makes it essential that concerted action be taken by States the world over. (p. 56)

The reader is encouraged to consider "the major problems of the contemporary world" (p. 24), implying a global perspective. Building on this, one is asked to consider the world-wide significance of the problem of environmental degradation seen in the following quote:

And this global problem obviously cannot be dealt with properly within the confines of individual regions and States; it is a crucial issue of world-wide significance. (p. 59)

Furthermore, UNESCO prides itself on:

Giv[ing] a *global*, practicable and useful framework to education. (p. 40)

When local considerations do appear, they are presented in the context of the "think globally; act locally" model. For instance, it is suggested that as a result of "having in mind the *global* impacts of the present, past and future evolution of all nations on our planet" there is a need to:

Facilitate comprehensive approaches to the solution of environmental problems within the jurisdiction of each country. (p. 40)

Local considerations are not omitted completely. However, global concerns drive local actions.

### *1987 and 1995 Documents – Thinking Locally*

Despite the previous wide use of the concept, “think globally; act locally,” it has become highly criticized. One concern is that it fails to consider the importance of local contexts and situated knowledge (Gough, 2000; Suzuki, 2004). Furthermore, the reality is that some global problems can only be solved by many different local solutions which stem from having a local understanding, not by a single solution applied everywhere (Orr, 1994). In my reading of the landmark documents, I do not identify a shift away from the promotion of one common global perspective until the 1987 report. This occurs simultaneously with the introduction of the term *sustainability*. The 1987 document considers local information in a manner not seen in the previous two documents. For example, a new importance is placed on the use of:

Local knowledge and traditional skills and values. (p. 15)

There is also a continued drive to shape educational programs so that they are region-specific. This is seen in the following comment which boasts of a project which has accomplished locally-focused educational materials:

Pilot projects carried out within the framework of the IEEP [International Environmental Education Program] in numerous countries have served not only to mobilize the national institutions concerned with environmental education, but also to train groups of educators at the national level and to develop educational content and material suited to local conditions.” (p. 3)

The development of such projects is then encouraged in the report. Moreover, the text emphasizes the connection between individuals and their physical environment through

encouraging collective local thinking on environmental issues. For instance, UNESCO recommends that training courses aimed at:

On-the-spot action which will enhance the relationship between local people and the resources upon which they depend. (p. 18)

Based on the scholarly literature on place, I suggest the new focus on locality indicates the belief that there is value in one's connection with place. Further evidence of there being a value placed on a connection with place is seen by an emphasis on increasing the utilization of natural parks, biosphere reserves and protected area, including the usage of such areas for the following purpose:

[The] establishment of special programmes and ecomuseums...for the preservation of traditional cultures, life-styles and resource use. (p. 19)

The shift from thinking globally to considering local knowledge becomes even more prevalent in my coding of *Agenda 21*. The report recommends the following:

Due respect should be given to community-defined needs and diverse knowledge systems, including science, cultural and social sensitivities. (p. 2)

Moreover, *Agenda 21* calls for the inclusion of indigenous knowledge systems in the sustainable management, planning and development of local environments. This is the first explicit recognition of alternative knowledge systems to Western science within landmark documents. The acknowledgment is stated in a way that links the use of such knowledge systems and the concept of *education for sustainable development*. For example, under the subheading of "*Reorienting Education Towards Sustainable Development*" the following is asserted:

Governments should affirm the rights of indigenous peoples, by legislation if necessary, to use their experience and understanding of sustainable development to play a part in education and training. (p. 3)

This inclusion of indigenous knowledge systems indicates an emphasis and support for local input. It aids in establishing important connections between individuals, society and place because many traditional knowledge systems are based on an intimate understanding of one's surroundings (Cajete, 1994).

Place-responsiveness is further supported by the heightened importance of community and the collective. In turn, this focus leads to the acknowledgement of the stronger dependence one has with ones surroundings and promotes a connection with place (Orr, 1994). Apple (1979) explains that when the opposite is true, where the focus is on the behaviour of individuals, the vital relationship one has with ones surroundings becomes distorted. If the coded sections of the first and last landmark documents are compared, the shift away from the individual as a central figure is stark. The Belgrade Charter states:

Individuals will themselves need to adjust their own priorities and assume a personal and individualized global ethic – and reflect on...their behaviour a commitment to the improvement of the quality of the environment. (p.2)

Here we are told that each individual bears the responsibility of the environmental crisis. In opposition to individual responsibility and action, *Agenda 21* tells us:

Communities [must mobilize] to assess their own needs and to develop the necessary skills to create and implement their own environment and development initiatives. (p. 2)

No longer is the individual being asked to act in isolation but rather to move as a member of a collective group. There is embedded within the collective an acknowledgement of the interconnection of individual human activity (Gruenewald, 2004a). Orr (1994) supports this claim maintaining “that rebuilding place focused [ideals] will require revitalizing the idea of citizenship rooted in local community” (p. 168).

Here the link between community and *education for sustainable development* is significant. This connection indicates to me that the concept of *education for sustainable development* is linked to place-responsive education. Cameroon (2003) tells us, “the central role of place education in any movement towards a sustainable society has been well established,” indicating this is not a unique focus of UNESCO’s term of sustainable development (p. 113).

#### *Summary of Place Responsiveness*

I have identified the “think globally; act locally” model as an underlying approach to UNESCO’s term of *environmental education*. However, as *education for sustainable development* becomes established in the discourse, the global perspective fades and the notion of place moves toward the forefront. Though UNESCO’s latter discourse is not solely focused on establishing one’s relations with place, there is evidence of heightened value given to local issues and the need for community action. Both, I argue, are supported by the scholarly literature and lead to a connection with place. In the following sections, place also emerges fostered through curriculum which examines the scientific, cultural and historical aspects of our environment. I explain that *education for sustainable development* considers economic, social and scientific factors, making it a more holistic approach than *environmental education*.

#### ***Science-Based Environmental Education***

The open coding of the landmark documents provides evidence that indicates science is not the crux of UNESCO’s term *environmental education* or *education for sustainable development*. Rather, my interpretation of the historical discourse suggests that UNESCO encourages an interdisciplinary approach that includes, but is not limited to, science. I support my findings by drawing on the three previously introduced characteristics of science-based environmental

education. I trace each characteristic through the historical discourse separately to determine the extent to which they are present.

### *Characteristic One*

The objective of *environmental education* according to the Belgrade Charter is the following:

To help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, aesthetic and educational factors” (p. 3).

I read this comment as an attempt to consider the interdisciplinary complexities of environmental issues. Further evidence of such an approach is found in the first of eight guiding principles:

Environmental education should consider the environment in its totality – natural and man-made, ecological, political, economic, technological, social, legislative, cultural and aesthetic. (p.4)

If we recall from the literature, environmental education based in science curricula often fails to address any interdisciplinary relationships of environmental issues (Palmer, 1998).

I identified a similar approach to environmental education in the 1977 document.

*Environmental education*, according to this second landmark document, is aimed at the following:

To help create an awareness of the economic, political and ecological interdependence of the modern world so as to enhance a spirit of responsibility and solidarity among nations. (p. 14)

Here we see again the interconnection of the economic, political and social with environmental issues explicitly stated. In addition, the introduction of the report declares,

It is not enough to make environmental education simply an adjunct to the normal curriculum. Environmental concerns must be an ever-present dimension and function of education in the broadest sense of the term, in all its forms and at all levels. (p. 7)

This indicates that environmental education must work towards addressing complexities of society, not science. This is once more seen in the 1987 document through the following section of text:

It has been made clear that environmental education should be a dimension of all subjects and areas of education taking into account both the social and the natural aspects of the human environment. Emphasis has therefore been placed on the interdisciplinary nature of environmental education. (p. 3)

From the statements above, I suggest that unlike environmental education programs based in science curriculum, UNESCO's concept considers the complex relationship between environmental issues and other aspects of society. Further evidence can be found under the *Approach* heading of the data table in Appendix A.

The inclusion of social, economical and political concerns in relation to the environment becomes ever more prevalent in the discursive trends of *Agenda 21*. This document continually makes reference to "environmental and development education" rather than only "environmental education." I propose the addition of "development" shows a connection between environmental, economic and social concerns (Palmer, 1998). *Agenda 21* states that addressing this interconnection is of value:

To be effective, environment and development education should deal with the dynamics of both the physical/biological and socio-economic environment and human (which may include spiritual) development, should be integrated in all disciplines, and should employ formal and non-formal methods and effective means of communication. (p. 1)

Here, three components of the environment are highlighted: the physical, social and economic. These aspects provide the foundation for *sustainable development* which is commonly known as the three pillars. The presence of the second and third pillar, social and economic considerations,

indicates that scientific knowledge is only one aspect of the underpinning *education for sustainable development*.

### *Characteristic Two*

The second aforementioned character of science-based environmental education is the assumption that scientific advancements alone can solve our environmental problems. In the *Belgrade Charter*, one of the guiding principles asserts:

Environmental education should focus on current and future environmental situations. (p. 4)

Here I note that no consideration is given to past events, which can challenge the direction of the future scientifically grounded environmental projects. However, in the 1977 document, a similar guiding principle includes historic considerations. The guiding principle reads:

Environmental education should...focus on current and potential environmental situations, while taking into account the historical perspective. (p. 27)

I suggest the addition of a “historical perspective” may indicate a trend toward questioning our past actions. In turn, this provides a space to challenge the assumed progress of science.

Though *Agenda 21* does not continue to promote the consideration of historical environmental events, it does challenge the assumptions of one directional progress. I draw our attention again to the frequently utilized phrase “environmental and development education,” which seems to replace the term *environmental education* throughout the document. The inclusion of “development” indicates that economic and social aspects are considered, not only the physical environment. I perceive the consideration of all three pillars (society, the economy and the environment) as a holistic approach which is not characteristic of science-based environmental education programs. The result is a critical perspective which enables the assumptions associated with science-based programs to be challenged. However, there are

sections of the text that promote science as a tool above and beyond other disciplines to better understand and manage the environment. For example, consider the following statement from the 1977 document:

Education utilizing the findings of science and technology should play a leading role in creating an awareness and a better understanding of environmental problems. It must foster positive patterns of conduct towards the environment and the nations' use of their resources. (p. 24)

In my reading of the UNESCO documents, such comments are inconsistent with the overall discursive trend.

### *Characteristic Three*

The third characteristic suggests it is common for science-based environmental education to undermine the importance of diversity. My analysis indicates that the historical discourse of UNESCO counters this characteristic by promoting cultural diversity. This is first seen in the Belgrade Charter, which creates space for cultural difference in regards to beliefs and values relating to the environment. "According to [their] culture," each nation is asked to "clarify the meaning of such basic concepts as "quality of life" and "human happiness" in the context of the total environment" (UNESCO, 1975, p.2). Similar acknowledgments promoting cultural differences continue throughout the 1977 and 1987 documents. For example, as previously mentioned, the 1987 document promotes the development of ecomuseums in conservation areas to help preserve traditional cultures and life-styles in regards how natural resources are used.

In the final landmark document, there is a movement toward the inclusion of alternative knowledge systems to Western science. The report asserts:

Governments should affirm the rights of indigenous peoples, by legislation if necessary, to use their experience and understanding of sustainable development to play a part in education and training. (p. 3)

This is reinforced by a recommendation made in terms of curricular development for environmental and development education. The report urges that:

Due respect should be given to community-defined needs and diverse knowledge systems, including science, cultural and social sensitivities. (p. 3)

As Bowers (2000) maintains, without an appreciation for diversity, which I suggest is promoted through the documents, one cannot understand ecological complexities of nature.

*Summary Science-Based Environmental Education*

My analysis reveals that UNESCO’s discourse contradicts all three characteristics of science-based environmental education. I have included a table that summarizes the three characteristics and counter discourses which emerged in the UNESCO documents (see table 5.2).

Table 5.2

*Science-Based Characteristics of Environmental Education and Education for Sustainable Development*

Characteristic of Science Based Environmental Education	Related Characteristic of Education for Sustainable Development
<i>Single Discipline Approach</i> – Does not take up the complex interconnection of environmental issues and factors outside of science.	<i>Interdisciplinary Approach</i> – Includes discussion of the impact of factors outside of science have on environmental issues.
<i>Assumes Continual Advancement via Science</i> – Does not question the possible setbacks of science.	<i>Challenges Linear Progress of Science</i> – Opens conversations to include political and economic aspects, allowing the benefits of scientific advancements to be questioned.
<i>Undermines Diversity</i> – By failing to include alternative knowledge systems undermines the importance of diversity.	<i>Promotes Diversity</i> – Encourages the use of alternative knowledge systems which results in the promotion of diversity.

The first column provides a short description of the characteristics of science-based environmental education, which I previously defined. The second column indicates what I perceived to be the related characteristics of *education for sustainable development* within UNESCO’s discourse. In turn, my findings indicate that UNESCO’s conception of *education for*

*sustainable development* is not grounded in science education. This indicates that UNESCO's discourse breaks away from the broader educational trend at the time which for years promoted environmental education as a topic to be grounded in science (Orr, 1994). Furthermore, the discourse seems to challenge the common single disciplinary approach to science which historically ignored external influences (Apple, 1990).

### ***Summary of Key Concepts and Ideologies***

This section considers what curriculum theories consider the verticality, or history, of *education for sustainable development* (Pinar, 2007). The process led me to identify three key concepts central to UNESCO's historical discourse on *environmental education* and *education for sustainable development*. I suggest that each of these key concepts has underlying ideologies which evolve throughout the discourse. By tracing the genealogical evolution of each, I identify a number of ideologies of UNESCO's term *education for sustainable development*. For example, where the UNESCO documents promote the term *education for sustainable development*, it appears the organization believes that education is to serve the primary purpose of economic development. Thus, I associate the ideology that schools are for economic gains with UNESCO's term *education for sustainable development*. Table 5.3 indicates the three key concepts and the ideologies linking it to UNESCO's term *education for sustainable development*. The first column presents the key concepts and the second column provides a brief description of the related ideology.

Table 5.3

*Summary of Key Concepts and Ideologies Associated with Sustainable Development*

Key Concept	Associated Ideologies
Dominant Purpose of Education	Economic production – To develop an efficient workforce
Perception of Place	Place-responsive – Fosters relationship between individuals/communities and their surroundings
Role of Science	Three pillars – The interconnection of economic, social and environmental aspects are considered

Let us now summarize how I identified each of the ideologies. The first key concept, the perceived purpose of education, aligns *education for sustainable development* with an underlying aim of economic development. This ideology emerges as the vision of a standard culture toward the environment and a new global ethic fades from the discourse. Also, there is a development of a direct link between training and vocational education and *education for sustainable development*. This reinforces my perception that producing an efficient workforce is a central aim of *education for sustainable development*.

The second key concept leads to my suggestion that UNESCO's term *education for sustainable development* promotes the ideology of place-responsive education. This ideology presents itself to me through several trends and shifts in the discourse. First, the initial emphasis on understanding environmental issues from a global viewpoint changes to understanding them from a local perspective, indicating a new focus on place. Second, there is an increasing focus on the action of the collective as the term *education for sustainable development* emerges. This emphasis fosters an understanding of the dependent relationship we have with those in our surroundings and is a component of place-responsiveness (Plumwood, 2002).

Lastly, I suggest the historical discourse indicates that *education for sustainable development* is a concept grounded in multiple disciplines, not solely Western science. This ideology emerges through a continued opposition to three characteristics of science-based

environmental education. Next, I examine the Ontario elementary science and technology curriculum document.

### **Analysis of the Ontario Science and Technology Curriculum**

The Ontario elementary science curricular discourse is more repetitive and laden with patterns than UNESCO’s historical discourse. Often a statement is repeated for each grade level as expectations are spiralled through the curriculum. For this reason, the analysis focuses first and foremost on the repetitive trends and deviations from the established patterns. Before discussing my findings, let us look at table 5.4, which summarizes the three key concepts and the ideologies I perceive the curricular discourse associates with each. This table provides some direction for the following discussion.

Table 5.4

*Summary of Key Concepts and Ideologies Associated with Environmental Education within the Ontario Elementary Science and Technology Curriculum*

Key Concept	Associated Ideologies
Dominant Purpose of Education	Transformative Education – knowledge is co-constructed
Perception of Place	Place-responsive – Fosters relationship between individuals/communities and their surroundings
Role of Science	Not solely science-based – Interdisciplinary approach

Similar to the previous table indicating the ideologies associated with *education for sustainable development*, the first column provides the key concepts and the second column provides a brief description of the related ideology. You may notice that both the ideologies associated with *perception of place* and *role of science* parallel the findings explained for UNESCO’s discourse, however, the *dominant purpose of education* differs from UNESCO’s discourse. I now discuss how my findings emerge through the analysis.

## ***Perceived Purpose of Ontario's Environmental Education***

As indicated in table 5.4, I suggest the environmental education initiatives within the Ontario elementary science and technology curriculum are based on the values and beliefs of transformative education. To explain my findings, let us consider the overall expectations and goals of the science and technology program present in the curriculum document:

### **1. To relate science and technology to society and the environment**

The overall expectation of relating science and technology to society and the environment (STSE) and the related cluster of specific expectations are placed first to better align the curriculum with the teaching and learning of science and technology, and to emphasize the importance of scientific, technological, and environmental literacy for all students. In addition, the STSE expectations set the context for developing the related skills and conceptual knowledge that are necessary for making connections between scientific, technological, social, and environmental issues. Many of the STSE expectations also focus on various aspects of environmental education.

### **2. To develop the skills, strategies, and habits of mind required for scientific inquiry and technological problem-solving**

The skills needed for developing scientific and technological literacy are outlined in the second overall expectation and in the related specific expectations found under the heading *Developing Investigation and Communication Skills*.

### **3. To understand the basic concepts of science and technology**

The conceptual knowledge requirements are outlined in the third overall expectation and in the related specific expectations found under the heading *Understanding Basic Concepts*. (p. 12)

From this section of text we learn that students are expected to “relate science and technology to society and the environment” before they “understand the basic concepts of science and technology.” I perceive this ordering of these overall expectations as an indication that environmental issues are used foremost as a conduit to considering the political, social, and economic influences on science. If understanding and gaining knowledge about the environment through science is the primary objective of the environmental education, logically, students would be expected to first “understand the basic concept of science and technology.” The expectation that students apply this knowledge to environmental issues would follow.

Furthermore, if developing a science-based environmental education program is a primary objective, I reason that the second and third expectations would make explicit reference to

environmental issues, as does the first. For example, the third expectation might read, “recognize and comprehend the basic concepts of science and technology that lead to an understanding of the environment.” The placement of the only reference to the environment in the overall expectation which relates science and technology to society suggests the Ministry’s conception of environmental education is not based solely on scientific knowledge. In order to relate science to society, connections need to be made between oneself, their lived-experience and science. This focus is aligned closely with the underlying values of transformative education, which centre on social contexts of meanings and diverse lived experiences (Jicklings &Wals, 2008). Thus, I suggest environmental education, in the context of this document, as being grounded in transformative education.

The curriculum’s limited emphasis on developing a science-based understanding of the environment is reinforced in the Ministry commissioned report, *Shaping our Schools, Shaping our Future*. The definition of environmental education is stated as:

An approach to critical thinking, citizenship, and personal responsibility, and can be modelled. It is a context that can enrich and enliven education in all subject areas, and offer students the opportunity to develop a deeper connection with themselves, their role in society, and their interdependence on one another and the Earth’s natural systems. (p. 35)

This definition avoids the implication that students ground their understanding of the earth’s system in scientific knowledge. Rather, it reveals the belief that *environmental education* should be rooted in questioning and decision-making, which is a central focus of transformative education (Jickling &Wals, 2008).

Let us also consider how the countless specific expectations that require the analysis of a situation from multiple perspectives supports transformative education. For example, in grade five students are expected to:

Look at issues such as recycling not only from the perspective of recycling plant operators but also from that of providers of raw materials, manufacturers, people concerned about the environment, and consumers. (p. 5)

Here, the issue of recycling is used as a means to develop questioning and critical thinking skills on topics which concern society and citizenship; scientific understanding is secondary.

Yet more evidence suggesting that environmental education is utilized in the curricular discourse as a means of developing critical thinking skills follows:

Never has it been more important for our students to be creative and critical thinkers. More than ever, they need to know how to understand situations and to respond to them in new ways. They need to be able to recognize the choices made by others, while being able to question the ideas behind the choices. They need to be able to think critically, to see things from many different perspectives, and to use all of the information available to make informed and reasoned personal choices about energy use and conservation. (p. 105)

I suggest this section of text indicates that producing individuals who question societal norms and are active in on-going decision-making within society is valued. Again, these characteristics are central to transformative education.

Lastly, I bring to our attention the absence of specific topics such as climate change. One possible explanation is that understanding particular environmental concerns is outweighed by developing analytical skills, further indication that the environmental education within the Ontario elementary science and technology curriculum is based on a transformative approach to education. This evidence of transformative education indicates that the Ontario Elementary curriculum does not reinscribe UNESCO's approach to *education for sustainable development*.

### *Place Responsiveness*

In this section, I consider the Ontario elementary science and technology curriculum as a place-responsive curriculum. I identify three main trends in the curricular discourse, which indicate that place underpins the concept of environmental education.

The concentration on the local world of the student, as opposed to the “global world,” is the first of these trends. For example, in the preamble, the curriculum urges the following:

The activities offered should enable students to relate and apply [fundamental] concepts to the social, environmental, and economic conditions and concerns of the world in which they live. (p. 9)

The focus here is not on thinking globally but rather on thinking locally and understanding the interconnecting aspects of place. This emphasis on locality reappears throughout the document in several key phrases such as “their world” and “the world around them.” These phrases promote the exploration of topics in the bounded surroundings to which students have personal connections. Absent from the curriculum are expectations that require students to apply their knowledge to communities beyond their own or outside of the local context. Simply stated, they are not required to “think globally.” Where students must consider issues from multiple perspectives, the varying viewpoints are specified to be those of different local community members.

The second trend which indicates a place-responsive curriculum is an emphasis on community. As aforementioned in the literature review, the concept of community in and of itself can lead to a more nuanced understanding of one’s interdependence with their surroundings (Orr, 1994; Plumwood, 2002). An awareness of this interconnection is essential for a connection with place to be established (Gruenewald, 2004a). Such connections are encouraged through statements such as:

A sense of place can be developed as students investigate structures and their functions in their neighbourhood, consider different ways in which food is grown in their community, and explore the impact of industries on local water systems. An understanding of the effects of human activity on the environment can develop as students consider the impact of their actions (e.g., taking part in tree planting at a local park, walking or biking to school instead of riding in the car, packing a litterless lunch) on their local environment. (p. 37)

Here the curricular discourse acknowledges that we are dependent on the community in which we live. Research suggests that where such recognition is not made in environmental education, place-responsiveness is sacrificed (Plumwood, 2002). Community remains a focal point of environmental education throughout the curriculum. This is exemplified in the following reoccurring statement, evaluating the impact of society and the environment:

...taking different perspectives into account (pp. 85, 88, 91, 99, 102 & 141)

Consistently, this statement is followed by a list of groups found within the local community which are to be considered.

The third and final trend within the curriculum document, which I suggest indicates that place is a highly valued concept, is the expectation that students are to physically explore their surroundings. In the introductory text to the life systems strand for grades one, four, six and seven it is declared:

Care must be taken to ensure that all students... have the opportunities to explore the natural world.

(pp. 44, 84, 112 & 126)

Place-responsiveness, as Plumwood (2002) tells us, is based on the physical exploration of our world. Concrete interaction with one's natural environment, combined with an understanding of the function of the community and a focus on the students' bounded world, provides evidence

that, ideologically, place-relationships are linked inextricably to the Ontario Ministry of Education's notion of environmental education.

These three aforementioned trends indicate similarities between UNESCO's landmark documents and the Ontario elementary science and technology curriculum in terms of the ideological beliefs that place is connected to *environmental education* and *education for sustainable development*. This is the first of the ideologies which the analysis, prior to the postcolonial deconstruction, the Ontario curricular discourse may reinscribe from UNESCO's historical discourse.

### ***Science-Based Environmental Education***

Scientific knowledge is explicitly stated as an important focus of the Ontario Ministry's environmental education initiatives. The Roberta Bondar report maintains that:

Environmental education rests on a foundation of knowledge from both science and social studies/geography. (p. 10)

As previously discussed, environmental education is commonly science-based in curricula divided by subject areas. However, my reading of the UNESCO landmark documents suggests that this is not the case for its concepts of *environmental education* or *education for sustainable development*. Therefore, in this section I consider to what extent the concept of *environmental education* within the Ontario elementary science and technology curriculum is based in scientific knowledge. In order to assess this, I return again to the three traditional characteristics of science-based environmental education programs.

#### ***Characteristic One***

Let us first examine the ways in which the curricular discourse approaches the complex interrelation between science and the broader context of society, recalling that the first

characteristic of science-based environmental education programs is the failure to consider this interrelationship (Adams and Luitel, 2008; Palmer, 1998; Rodriguez, 1998). I suggest this narrow focus does not appear to be the approach promoted by the Ontario elementary science curriculum and technology document. Rather, the discursive trends indicate that environmental issues are being used as a means to consider the connection between science and society. Environmental issues throughout the document are consistently applied to support the inclusion of external factors which affect science, such as society, economics and the environment itself. For example, the preamble states the following:

Science and technology exist in a broader social and economic context. Both are affected by the values and choices of individuals, businesses, and governments, and in turn have a significant impact on society and the environment. (p. 9)

Hence, science is not seen only as experiments that take place in a closed laboratory. Instead, it is approached as a discipline that is influenced by many other factors. Furthermore, as aforementioned, the curricular expectations repetitively require students to consider situations from the perspective of a variety of community members. One such example is the following grade-four expectation:

Analyse the positive and negative impacts of human interactions with natural habitats and communities (*e.g., human dependence on natural materials*), taking different perspectives into account (*e.g., the perspectives of a housing developer, a family in need of housing, an ecologist*), and evaluate ways of minimizing the negative impacts. (p. 84)

This specific expectation, which falls under the overall expectation of relating science and technology to society and the environment, suggests that the Ministry's concept of *environmental education* challenges the traditional apolitical nature of science education. In turn,

this indicates that the concept of *environmental education* promoted through the Ontario science and technology curriculum uses, but is not solely, based in scientific knowledge.

### *Characteristic Two*

The curricular discourse also appears to challenge the second characteristic of science-based environmental education programs. Let us recall that the second characteristic is the belief that scientific advancements lead to linear progress and in turn hold the solution to our environmental concerns. My analysis reveals that, consistently, both the positive and negative environmental impacts of science are considered. For example, the following expression is found in expectations listed for grades four, five and eight:

...taking different perspectives into account” in regards to a variety of issues. (pp. 85, 99 & 141)

In all cases, this statement is made in regards to the environmental impacts of science and technological advances. Other frequently stated phrases that work to question the taken-for-granted progressive direction of science include “assess the impact” and “evaluate the impacts,” which also appear in the context of environmental education.

Though I perceive that the dominant trend of the curricular discourse challenges the taken-for-granted linear progress of science, there is evidence that this view is partially supported. I would like to draw our attention to the absence of historical events in the document. In some instances the past tense is employed, implying the consideration of previous occurrences, for example:

Assess ways in which the actions of humans have an impact on the quality of air and water, and ways in which the quality of air and water has an impact on living things. (p. 66)

However, there is no direct reference to specific historical events. The curriculum does not include events such as the Plastimet Inc. fire in Hamilton, where 400 tonnes of plastic waiting to

be recycled and disposed of in a manner considered safe for the environment went up in flames. The fire left devastating air, soil and water contamination, rendering the site of the blaze one of the most toxic sites in Canada (Ministry of Environment and Energy, 1997). Historical events such as these can lead to further questioning of the true political, economic, social and environmental impacts of science advancements. In this case, we see the potentially devastating effects of plastics, despite our ability to recycle. Regardless of this contradiction, I perceive that the dominant discursive trends of the document counter the second characteristic of science-based environmental education programs.

### *Characteristic Three*

The failure to utilize knowledge systems other than Western-science to understand the environment is the central aspect of the third characteristic of science-based education. Contrary to this characteristic, the Ontario elementary science and technology curriculum document does consider other knowledge systems. For example, grade-seven students are expected to do the following:

Describe Aboriginal perspectives on sustainability and describe ways in which they can be used in habitat and wildlife management. (p. 128)

However, I perceive an underlying contradiction within the curricular discourse. The document calls for the perspectives of Aboriginal cultures to be viewed not as they relate to the natural environment or one's surrounding, but rather as they "relate to science and technology" (p. 37).

The knowledge of diverse cultures is discussed only in terms of how they:

Contribute to science and technology" and/or "use science and technology to solve problems in their daily life and work" (p. 37)

By utilizing Western-science and technology as a platform for understanding the perspectives of different cultural groups, multiple lenses are not employed. I explain this concern further in the following chapter.

Despite this and other contradictions, the dominant trend in the curricular discourse works to oppose the three central characteristics of environmental education of science-based environmental education. This parallels UNESCO's concept of *education for sustainable development* indicating the belief that science is only to have a partial role in environmental education is reinscribed.

### ***Summary of Ontario Curriculum Ideologies***

In this section I explore how the key concepts that emerged from my analysis of UNESCO's discourse are taken up in the Ontario elementary science and technology curriculum discourse. Let us recall that I suggest each of these key concepts has underlying ideologies. Therefore, I analyzed to what extent the ideologies associated with the key concepts in UNESCO's discourse on *education for sustainable development* are reinscribed and/or subverted in the Ontario elementary science and technology curriculum document. My analysis indicates that the dominant perceived purpose of UNESCO's concept of *education for sustainable development* differs ideologically from the apparent purpose of environmental education within the Ontario elementary science curricular discourse. However, UNESCO's ideological approach to the concept of place and the role of science as they relate to *education for sustainable development* are congruent with the curricular discourse.

## CHAPTER SIX: A POSTCOLONIAL DECONSTRUCTION

In this chapter I deconstruct the previous analysis through a postcolonial lens. I have organized the chapter into four main parts. In the first section, I situate the broad field of postcolonial studies and explain the process of deconstruction which I employed. The following three sections detail my deconstruction of the three key concepts: 1) the predominant purpose of schooling; 2) the perception of place; and 3) the role of Western-scientific knowledge. In each of these sections, drawing on my previous analysis, I work toward understanding how UNESCO's landmark documents and the Ontario elementary science and technology curriculum create a colonizing and/or decolonizing discourse.

### *A Postcolonial Deconstruction*

In chapter three, I discussed postcolonialism as a complex heterogeneous conceptual and theoretical framework utilized in various fields of study (Kanu, 2006). Ashcroft views postcolonialism more broadly as the study of cultural and political identity of colonized subjects, with the central focus being the historically contextualized experiences and practices of cultural dominance and subordination (Ashcroft, Griffith and Tiffin, 1989). He also extends the meaning of postcolonialism to “a sustained attention [of] the imperial process in colonial and neo-colonial societies with an examination of the strategies to subvert the actual materials and discursive effects of the process” (p. 117). The postcolonial analysis that follows is situated primarily around the work of Kanu (2006), Lomba (1998) and London (2003). These scholars view postcolonial theory as a framework from which to critically question the political, social and cultural production of recent Western dominant powers. In turn, they view postcolonial theory as a site from which to study the interconnection of issues such as identity and cultural production, of which schooling is a strong component (London, 2003). “Postcolonialism,” as London (2003)

maintains, “calls for a major rethinking of given categories and histories, questions assumed and fixed structures and brings greater sense of political to the interpretation of social and cultural production” (p. 37). This understanding of postcolonial theory allows me to deconstruct both the key concepts and the ideologies I associate with UNESCO’s concept of *education for sustainable development* and the Ontario elementary science curricular discourse.

Specifically, the deconstruction draws on postcolonial writing to reveal, challenge, reflect upon and think differently about the underlying assumptions that make possible the meanings that emerge throughout the discourse (Egea-Kuehne, 1995; Ng-A-Fook, 2008). As concepts become unravelled through deconstruction, tangled contradictions are exposed, which in turn lead to a more nuanced awareness of the discursive trends (Britzman, 1995; Lather, 1991). As Charter (2005) writes, deconstruction draws our “attention to the absence, elisions, and unconsciousness in textual practice that despite author intentions...can articulate meaning constituted and disseminated through long-standing hegemonic practices” (p. 915). In turn, postcolonial deconstruction helps us to understand the colonizing and/or decolonizing trends within educational discourse. In the following section, I begin the postcolonial (re)read of my initial analysis deconstructing the discourse surrounding the purpose of education.

### ***Purpose of Education***

In my initial analysis, I discussed the perceived purpose of education in terms of transmissive education and transformative education. I start with the concept of transmissive education. In particular, I consider the power relations connected to cultural and economic production attained by transmissive education. Hegemony is an essential concept when discussing transmissive education because, as Aschcroft, Griffith and Tiffin (1998) tell us, this concept is central to the process of cultural production. However, hegemony is an elusive concept that is used

inconsistently (Clayton, 1998). In this section, I consider the concept in its broadest sense as the diffusion of an uncritical absorption of dominant ideologies through society (London, 2003). Therefore, hegemony can lead to what Ascroft (2001) and Fuller (2000) express as the most durable aspect of colonization—i.e. binary thinking. These postcolonial scholars, define binary thinking as an approach of viewing the world through binary divisions, which makes diversity problematic. Ashcroft (2001) explains that the fundamental feature of the colonial enterprise was the successful binary set-up between colonizer and colonized and the power relationship this binary facilitated. In turn, this deep rooted binary, Charter (2004) maintains, has led to binary thinking which, “generates alternative versions of sameness, and effectively defines the terms in which the Other is allowed to exist” (p. 826).

I suggest that UNESCO encourages binary thinking through a hegemonic discourse. In order to understand how UNESCO is able to accomplish this, I would like to revisit the concept of discourse momentarily. Let us recall from chapter three that discourse is the process and structure through which culture, politics and economics practices of society are produced, reproduced and/or subverted (Altbach, 1995; Prasad, 2003). As a result, discourse can be a conduit for the hegemonic process. My (re)reading of the analysis of the first two landmark documents indicates that UNESCO uses discourse as a channel to diffuse its dominant ideologies on the environment, which I now explain.

#### *Cultural Production 1975 and 1977*

Before discussing the coded sections of these documents, I turn briefly to the work of Kanu (2006), which is focused on deconstructing curriculum as a cultural practice through a postcolonial framework. The following passage provides a summary of how, in his view, colonizing and postcolonial curricula differ:

Curriculum mediated by a colonial imagination has been employed to neutralize difference, assimilate and establish for the other a worldview and concept of self and community; in second, imagination refers to a process proposing reform where curriculum could be reconceptualised/reimagined in ways that are more responsive to multiplicity, difference, and identity affirmations that condition the postcolonial. (p.7)

I suggest that this creation of a “neutralized difference and assimilation,” which Kanu associates with a colonizing curriculum, results from the transmission of unquestioned ideologies, which is a form of hegemony. In my initial coding of the UNESCO documents, I perceived this form of hegemony through the attempt to transmit global beliefs and values connected to the environment. For example, UNESCO endorsed a “new global environmental ethic.” As aforementioned, this new ethic was described as, “a mass culture in respect of the environment [that] should be shared by all sectors of the population and by the majority of countries” (UNESCO, 1987, p. 18). This quote is an example of establishing, what Kanu (2006) terms, “neutralizing differences,” an attempt to establish an unquestioned worldview. Moreover, both the concepts of a “global environmental ethic” and a “global environmental culture” encouraged through UNESCO discourse indicate that *environmental education* aspires to have a significant role in forming cultural values writ large. It is quotes such as “education should help to shape the behaviour required by all” (UNESCO, 1977, p. 8) which I suggest signify a hegemonic process. Here UNESCO attempts to transmit one set of “correct” beliefs and values. This in turn leads to the problematic binary thinking, which, as previously mentioned, Ashcroft (2001) and Fuller (2000) maintain is the most durable aspect of colonization. Therefore, I suggest that UNESCO’s early hegemonic discourse is a mechanism for reinscribing this aspect of colonialism.

### *Economic Production 1987 and 1992*

UNESCO's later landmark documents link the concept of *education for sustainable development* to schooling aimed at economic production. That is not to say that elements of cultural production are absent from the discourse. Giroux (2001) explains that training workers involves not only developing skills and competencies necessary for production but also must "ensure that workers will embody the attitudes, values, and norms that provide the required disciplines and respect" (p. 79). Therefore, cultural production is still present in education aimed at training students for specific skills required in the workforce. Consequently, the postcolonial deconstruction of cultural production applies to UNESCO's latter landmark documents, in addition to the further postcolonial analysis provided below.

Clayton (1998) views postcolonial international educational assistance as "hegemonic ventures dedicated to the engineering of consent in periphery nations to a variety of inequitable and exploitative international structures and relationships" (p. 484). In many cases, postcolonial education aid is linked to economic exploitation, and thus considered a form of neo-colonialism (Brydon, 2000; Clayton, 1998; Moore-Gilbert, 1997; Prasad, 2003). Let us recall from chapter three that, neo-colonialism is the continued economic and cultural dependence created by the West through non-traditional means (Brydon, 2000; Moore-Gilbert, 1997; Prasad, 2003). Hence, aid that works to develop a labour force that can be controlled and managed by elites and/or by the former colonizer is a form of neo-colonialism (Clayton, 1998; Plumwood, 2002). This is accomplished, Clayton (1998) tells us, via educational reforms, which in turn "seek to implant particular ways of thinking in the periphery about political and economic systems" (p. 486). In this section, I discuss how these concerns with educational reform may be subverted, at least in part, by UNESCO's educational discourse.

Knowledge in some cultures remains integrated, unlike in Western cultures, which tend to create a divide between rational and practical forms. For example, many tasks of decision-making and management can efficiently be combined with the practical aspects of the work carried out by labourers. However, decision-making is often reserved for managers, resulting in distant and controlling elites (Plumwood, 2002). Educational aid often works to further this divide. In postcolonial countries, these managerial or elite positions are often reserved for those who have close ties to Western economic and political interests. The result is a form of colonizing control (Plumwood, 2002). As an engineer working in Ghana, I experienced this on a very small scale. Working for a palm oil mill, I was often asked to deal directly with the affluent village chief who very rarely visited the mill. All decisions would have to be made via the chief, despite the capabilities of lower management at the mill. Though I am not aware of any political ties to the West, the chief undoubtedly had strong personal ties, having been educated in, and paying frequent visits to Europe.

I suggested that UNESCO's discursive trends work to subvert this neo-colonizing process. Here I revisit three quotes previously discussed in chapter five that support this perception. I begin with a quote from *Agenda 21*, "international bodies should make increased efforts, particularly in the developing countries, to train a sufficient number of high-level personnel to ensure sustainable development and economic growth" (p. 18). Training personnel internally within developing countries is encouraging in terms of bridging the problematic labour and management separation engrained through colonization. Furthermore, *Agenda 21* recommends giving "special emphasis to the further training of decision-makers at all levels" (p. 2). If individuals at all-levels of the workforce, including labourers, are provided with decision-

making training, this may work to bridge the divide between the workforce and the decision-making elite (Plumwood, 2002).

Lastly, I would like to draw our attention to one of four objectives to help reorientation towards *education for sustainable development*. Training programmes should, it states, work to “strengthen national capacities, particularly in scientific education and training” (p. 5). Here I perceive an attempt to promote a level playing field for all nations, which works against further development of a concentrated decision-making elite. However, from a postcolonial lens, I also perceive contradicting ideas in this statement. By highlighting scientific education there is an emphasis placed on Western science, which is colonizing in and of itself. I look at this in greater depth later in this chapter.

In summary, postcolonial theory reveals complex contradictions in the discursive trends, which led to my perception of a transmissive educational approach by UNESCO. In the early landmark documents, I suggest that UNESCO’s promotion of a standardized environmental culture results in a hegemonic colonizing discourse. However, throughout the last two landmark documents, UNESCO’s discourse challenges this colonizing approach through specific recommendations to train a well-balanced workforce in all countries.

#### *Purpose of Education – Ontario Elementary Science and Technology Curriculum*

To begin my postcolonial analysis of the Ontario elementary science and technology curriculum, I return to what Ashcroft (2001) and Fuller (2000) both maintain is the most durable aspect of colonization: the imposition of binary thinking. Through this statement, I deconstruct the order of the curriculum’s three overall expectations. Let us recall that the first of three overall expectations is “to relate science and technology to society and the environment.” This expectation provides students with some flexibility to draw on their own individual lived-

experiences and co-construct their understanding. I suggest that positioning this expectation prior to “understand[ing] the basic concepts of science and technology” indicates that learning from previous knowledge and diverging perspectives are both valued. Furthermore, as explained in chapter five, such an approach promotes on-going questioning, problem-solving and decision-making (Jickling, 2008). Thus, the ordering of the overall expectations indicates a step toward subverting the imposition of binary thinking through creating a space which appears to value a diverse range of beliefs, understandings and opinions on various topics and problems.

Furthermore, transformative education, which I suggest is the underlying purpose of environmental education in the curricular discourse, responds to multiplicity and differences. This is seen in the continual demands on students to consider issues from differing perspectives. And “multiplicity, difference, and identity affirmations” are the characteristics of a postcolonial curriculum (Kanu, 2006, p. 7). Therefore, this is evidence that the Ministry’s approach to environmental education resists aspects of curriculum that are seen as colonizing.

I also suggest that the Ontario Elementary Science curricular discourse works to counter hegemony. To illustrate this, I revisit two passages. The first is the definition provided for environmental education:

... an approach to critical thinking, citizenship, and personal responsibility, and can be modelled. It is a context that can enrich and enliven education in all subject areas, and offer students the opportunity to develop a deeper connection with themselves, their role in society, and their interdependence on one another and the Earth’s natural systems. (p. 35)

I would like to draw our attention to the concept of developing a connection with oneself. Gramsci explains that “the starting point of critical elaboration is the consciousness of what one really is” (Gramsci, as cited in Burke, 2005). The hegemonic function of schools can only be challenged if learning is related to the students’ everyday life. In addition, students must be able

to be active and creative in their learning. Such creativity and critical awareness is promoted in the curricular discourse:

Never has it been more important for our students to be creative and critical thinkers. More than ever, they need to know how to understand situations and to respond to them in new ways. They need to be able to recognize the choices made by others, while being able to question the ideas behind the choices. They need to be able to think critically, to see things from many different perspectives, and to use all of the information available to make informed and reasoned personal choices about energy use and conservation. (Ontario Ministry of Education, year, p. 10)

The Ministry's call for "creative and critical thinkers" is thus leading education in a direction that I suggest might work to oppose hegemony.

### ***Place-Responsiveness***

The concept of place is fundamental to postcolonialism as its domination was central to colonial rule (Ashcroft, 2001). As land quickly became a political and economic resource, the connection between people and their surroundings weakened (Tropp, 2006). The ideological and political hegemony achieved during colonialism was dependent on the ability to control the context of personal and social experience, both of which shape one's perception of a place (Harvey 1989). Ashcroft (2001) explains, "so complete has been the reorganization of the 'lived-place' of many ethnic groups into political, economic and cultural boundaries of colonial space the concept and experience of place could be the one discourse of postcolonial life most resistant to transformation" (p. 124). Such a deep disruption of place-based relationships, Adams and Mulligan (2003) argue, has led to our colonization of nature. In particular, this results from our sense of interconnection with our surroundings being lost, as land became first and foremost a resource for exploitation tied to political and economic gains. In turn, society has learned to see nature as the "other" rather than as something to which we are intrinsically linked. This is

exemplified by the notion of confined nature reserves or conservation areas, as opposed to a holistic approach to caring for our environment.

What is required for such a deep-set cultural transformation, or decolonization, according to Ashcroft (2001) is “the creative reconstruction of the lived environment, the reassertion of place in language and textuality” (p. 124). Mulligan and Adams (2003) suggest that individuals and communities need to reconnect with the surroundings in which they inhabit and understand the vital interrelationships they have with these spaces. As well, there is reason to understand historical relationship with one’s surroundings in order to restore a deep-seated connection to nature. This could lead us to understand the value of a once strong connection between societies and the places they inhabited (Adams & Mulligan, 2003; Plumwood, 2002; Tropp, 2006).

In this section, I deconstruct both UNESCO’s historical discourse and the Ontario elementary science curricular discourse associated with place. I work toward identifying the extent to which these discourses dislodge our colonized relationship with nature through supporting the construction and/or reconstruction of the relationship of individuals and communities with place (Greunewald, 2003a). Consequently, I am looking for evidence of a place-responsive curriculum focused on lived-experiences, as well as instances where value is given to historical relationships with nature. These trends have been identified by postcolonial scholars as having the ability to decolonize and transform our relationship with nature (Adams and Mulligan, 2003).

Similar to the earlier analysis using a postcolonial lens, I return to the previously coded sections of texts and deconstruct them, drawing on the writing of postcolonial theorists. First, it is important to recall that reflecting on one’s lived-experiences of the spaces they inhabit is vital in order to establish a nuanced relationship with place (Gruenewald, 2003a). Such reflection can

lead one to understand how they construct meaning from the space and how it may influence their actions, reinforcing the importance of such a relationship (Gruenewald, 2003b). Attention to locality has been proven an effective means of learning about our dependence on nature, leading to a renewed respect for our environment (Adams and Milligan, 2003).

Though I did not perceive a strong presence of place-responsiveness in the first two landmark documents, place starts to emerge as a central concept in the final two documents. In the 1987 document, UNESCO promotes the development of courses that “enhance the relationship between local people and the resources [upon] which they depend” (p. 18). I suggest the use of the word relationship in this statement works to develop the connection between individuals and their surroundings. Adams and Mulligan (2003), Ashcroft (2001) and Gruenewald (2003a) maintain that this interconnection is required to decolonize our relationship with nature. Changing our perception of nature as solely a resource to be exploited requires that we develop a strong and more nuanced relationship with nature itself (Adam and Mulligan, 2003).

In addition, I drew attention to the encouragement of groups marginalized by colonialism to share their previously lived experiences. For example, “Governments should affirm the rights of indigenous peoples, by legislation if necessary, to use their experience and understanding of sustainable development to play a part in education and training” (UNESCO, 1995, p. 3). This approach indicates value is placed on gaining an understanding of the environment through reflection and historical experiences. Again, this is a characteristic that postcolonial scholars suggest can lead to the demise of our colonization of the environment.

In the Ontario science and technology curriculum, we again see value being placed on the lived experiences and understanding of one’s connection to their surroundings. Perhaps the most

transparent example of this is the continued mention that “care must be taken to ensure that all students... have comparable opportunities to explore the natural world” (pp. 44, 48, 112 & 126). The exploration of nature is the first step to developing a nuanced respect for its essential intricacies (Louv, 2005). Furthermore, a space to foster an understanding of one’s surroundings through lived experiences is established in the first overall expectation, which is to relate science and technology to society and the environment. One specific example under this expectation is the requirement that students question why they and their families participate in different outdoor activities during the day than at night. I suggest this requirement leads to the deconstruction of the view that nature is the “other.” Typically, when nature is seen as the “other,” it is presented as an object that humans control, not an aspect of one’s surrounding which can influence human behaviour. Through acknowledging its effect upon us, we in turn recognize that we are intrinsically linked to it.

However, a closer look at the specific expectations that fall under the overall expectation of relating science and technology to society and the environment reveals that not all of the requirements foster the relationship needed to decolonize our perception of nature and our surroundings. One such example is found in the following suggested guiding questions: “Why is it important for companies to find out what consumers want now and what they might want and/or need in the future? What things might a company need to take into account when considering the construction of a new structure that consumers might not consider? (p. 130). I have several concerns with these questions. First, students may not necessarily be able to make a personal connection to a company’s needs when considering the construction of a new site, especially if these are to be those not on the minds of consumers. Such questions do not lead one to understand our dependence on our environment and, in turn, do not provide the support to

develop place-responsive relationships. Therefore, employing a postcolonial lens to the section of the text that I previously identified as “place-responsive,” indicates that the Ontario elementary science and technology curriculum might inhibit reconstructing our relationship with nature.

Consequently, UNESCO discourse seems to be more apt to decolonize our relationship with our surroundings than the Ontario Ministry of Education. However, neither discourse pays significant attention to the histories of communities, a dimension that many scholars deem is important to reconstruct our once strong connection to nature and the environment (McLean & Giroux, 1990; Gruenewald, 2003b; Ashcroft, 2001). The inclusion of multiple histories is seen in the early UNESCO documents, for example the 1977 document recommends:

That responsible authorities support curriculum development as it relates to particular situations such as exist in urban areas, rural areas and areas of social, historical and cultural importance, and to the needs of particular groups such as farmers, industrial workers and parents. (p. 33)

However, the mention of such histories and historical environmental conditions disappears from the discourse by the final landmark document. In the case of the Ontario elementary science document, historic environmental or even scientific events are almost completely absent. In terms of decolonizing our relationship with nature, this gap in the discourse is problematic. A historical understanding of how society has connected, or has not connected, can lead to an understanding of the respective benefits and shortfalls and in turn can support the construction/reconstruction place-responsive relationships.

Furthermore, postcolonial writers point to enabling communities to construct collective identity as a means of decolonizing society’s relationship with the environment. A collective identity allows for the consideration of community specific experiences, problems, languages

and histories. Acknowledging such aspects in a specific geographic context of a community opens up the way in which one understands place (McLaren, 1990). Gruenwald (2003b) tells us of two approaches to place-based learning that foster this valued collective identity: 1) community issue-investigation and problem-solving and; 2) introduction into community decision-making. I argue these are apparent in UNESCO's discourse which asserts, "communities [must mobilize] to assess their own needs and to develop the necessary skills to create and implement their own environment and development initiatives" (UNESCO, 1995, p. 2). Asking communities to assess their needs indicates precisely what Smith calls for "community issue-investigation." Furthermore, the direction toward training all levels of the workforce locally, as previously discussed, is evidence of education which focuses on "local internships and entrepreneurial opportunities." As a result, UNESCO's discursive trends seem to centre on aspects of education which construct a collective identity.

The Ontario elementary science and technology curriculum also seems to follow UNESCO in this direction. The community issue-investigation and problem-solving, as well as community decision-making, are developed and encouraged through the continual expectation that students analyze specific environmental concerns from numerous perspectives from within the community. For example, students in grade 4 are asked to:

Analyse the positive and negative impacts of human interactions with natural habitats and communities (*e.g., human dependence on natural materials*), taking different perspectives into account (*e.g., the perspectives of a housing developer, a family in need of housing, an ecologist*), and evaluate ways of minimizing the negative impacts. (p. 84)

The above discussion indicates that, although there are some minor contradictions embedded within the respective discourses. UNESCO's concept of *education for sustainable development* and the Ontario elementary science and technology curriculum work to decolonize society's

perception of nature. This is achieved through two trends. The first of these is the reconstruction of our relationship with our surroundings by the promotion of a place-responsive discourse. The second is through developing a community identity which is connected to place.

### ***Science-Based Approach to Environmental Education***

I have situated neo-colonialism, as the continued economic and cultural dependence created by the West through non-traditional means (Brydon, 2000; Moore-Gilbert, 1997; Prasad, 2003). Altbach (1995) writes that one way in which neo-colonialism is being undertaken is through sustained pressure on developing countries to focus primarily on Western science in their school systems. This can result in the loss of valuable indigenous epistemic systems for understanding the environments we live within. Though I suggest in my previous analysis that neither UNESCO's or the Ontario elementary science and technology curriculum discourse is based solely in scientific knowledge and incorporates other knowledge systems, a postcolonial deconstruction reveals otherwise. In this section, I look at each characteristic of science-based environmental education in relation to corresponding postcolonial literature. I revisit the discursive trends identified previously as countering the characteristics to reveal any embedded colonizing tendencies.

#### ***Characteristic One***

I previously suggested that UNESCO's discourse acknowledges the impact external factors can have on scientific knowledge through encouraging an interdisciplinary approach to *environmental education* and *education for sustainable development*. However, postcolonial literature maintains that an interdisciplinary approach to education in and of itself is colonizing (Carter, 2003; McKinley & Aikenhead, 2005; Snively & Corsiglia, 2005). Disciplinary boundaries are deeply implicated in Western thinking and, as a result, the promotion of such

borders around subjects leads to colonizing tendencies embedded within the discourse (Charter, 2004).

UNESCO's initial discourse appears to avoid the division of disciplinary boundaries throughout its discourse on *environmental education*. The description of *environmental education* provided in the 1977 documents refers to the "interdependence" of a number of contributing factors to our understanding of the environment. *Environmental education*, UNESCO (1977) recommends, should "create an awareness of the economic, political and ecological interdependence of the modern world so as to enhance a spirit of responsibility and solidarity among nations" (p. 14). I suggest this statement and other similar statements found in the first two landmark documents indicates that UNESCO's concept of *environmental education* opposes the colonizing tendencies created from imposing disciplinary boundaries in educational discourse.

However, statements coded in the latter two landmark documents indicate the assumption that education is to be conducted through bounded subject areas. For example, the 1987 report asserts, "it has been made clear that EE should be a dimension of all subjects and areas of education taking into account both the social and the natural aspects of the human environment" (p. 3). The concept of separate subject areas referenced here, as aforementioned, is linked to Western education. Thus, subject boundaries diminish other knowledge systems and gives undue authority to Western culture. This bias is repeated in *Agenda 21*, which maintains:

To be effective, environment and development education should deal with the dynamics of both the physical/biological and socio-economic environment and human (which may include spiritual) development, should be integrated in all disciplines, and should employ formal and non-formal methods and effective means of communication. (p. 1)

Again, we see an assumption that education should be delivered through separate disciplines. Based on postcolonial literature, I suggest this privileging of the West indicates a colonizing tendency of UNESCO's discourse on *education for sustainable development*.

My postcolonial deconstruction of the Ontario elementary science and technology curriculum analysis reveals a contradiction embedded within the discursive trends. First, I state without reservation that bounded subject areas are fundamental to the Ministry's educational model. Furthermore, we should not be surprised that their concept of environmental education also follows a discipline-based approach. The curriculum document, quoting the Bondar report, demands that environment education rest on a foundation of knowledge from two separate and bounded disciplines: science and social studies (Ontario Ministry of Education, 2007). However, I suggest the curricular discourse which discusses environmental issues from a broader social and economic context strays from the defined disciplinary walls. Let us considering the following specific expectation:

Analyse the positive and negative impacts of human interactions with natural habitats and communities (*e.g., human dependence on natural materials*), taking different perspectives into account (*e.g., the perspectives of a housing developer, a family in need of housing, an ecologist*), and evaluate ways of minimizing the negative impacts. (p. 84)

Here we see an example of students being required to consider their environments from a variety of perspectives. By drawing on complex lived situations to guide students, boundaries of disciplines dissolve as the realities of interconnection are considered above and beyond disciplinary based knowledge. Thus, the postcolonial (re)read indicates the Ontario elementary science and technology curriculum and UNESCO's discourse at times are centred on disciplinary boundaries, while at other instances discuss a holistic approach. Let us now consider what my

postcolonial deconstruction reveals in regards to the second characteristic of science-based environmental education.

### *Characteristic Two*

The second characteristic of science-based environmental education is grounded in the taken-for-granted view that scientific development equates to linear progress. Thus, environmental education grounded in knowledge beyond science may take into consideration the political and ethical consequences that scientifically grounded solutions have on the world. Furthermore, approaches may include equally infused critiques of science and acknowledgements of its possibilities (Carter, 2004). But postcolonial theorists go further, suggesting that to avoid a colonizing privileging of Western science-based discourse, the inclusion of scientific pluralism is required (Kuhn, 2003; McKinley, 2005; Snively & Corsiglia, 2005). McKinley and Aikenhead (2005) defines scientific pluralism as the view that some phenomena observed in science require multiple explanations to account for their nature and, hence, the denial that there is one unified scientific method. This requires hybrid and broader epistemologies than that of Western science.

I suggest that UNESCO's discourse provides a space for the hybrid of epistemologies mentioned by postcolonial theorists. Let us first consider the following quote from the *Belgrade Charter*, "According to [their] culture," each nation is asked to, "clarify the meaning of such basic concepts as "quality of life" and "human happiness" in the context of the total environment" (UNESCO, 1975, p.2). Though this comment does not directly acknowledge separate epistemologies, I suggest it creates a space which supports them. Perhaps one's meaning of happiness or quality of life does not influence immediately "what knowledge is" to that individual and/or community, or shape "how they acquire knowledge." But, it may shape how they construct meaning from their knowledge. Also, encouraging different beliefs, on such basic

concepts as those stated above creates a discourse that I perceive as supportive to different epistemological approaches to understanding environmental issues.

Furthermore, there are several instances in the second and third UNESCO landmark documents in which historical perspectives are considered. For example, the 1977 report states, “environmental education should...[take] into account the historical perspective” (p. 27). Again, this does not directly state the inclusion of multiple epistemologies. However, I suggest that considering historical perspectives may influence how knowledge is constructed. Unfortunately, I found little evidence either supporting or opposing the inclusion of multiple epistemologies in the latest landmark document, which is the most closely linked to the concept *education for sustainable development*. Again, we see an underlying contradiction embedded within the discourse.

I struggle to deconstruct this aspect of postcolonialism in the Ontario elementary science and technology curriculum due to a lack of relevant discourse. I acknowledge the discussion in this section may lack rich support. Let us begin by considering the repeated expectation to question “the positive and negative aspects of the issue.” Though this may lead to the critique of scientific advancement, I suggest it falls short of promoting multiple epistemological understandings of the issues. Nowhere in my analysis did I note the explicit or implicit requirement to question what knowledge is acquired or how knowledge is acquired. Moreover, differing cultural beliefs are not promoted to the extent seen in UNESCO’s discourse. I suggest the absence of this conversation may indicate that multiple epistemological understanding of the concepts at hand is not encouraged in the curricular discourse. To further support my suggestion, I bring to our attention the omission of historical events or perspective. As explained above,

historical events can lead to a better understanding of the construction of different epistemologies.

Thus, according to postcolonial theories, both UNESCO's discourse and the Ontario elementary science and technology curriculum fail to question the progress of Western knowledge in a manner that works to decolonize the discourse.

### *Characteristic Three*

Postcolonial theory indicates that the inclusion of indigenous knowledge systems is essential to avoid a colonizing discourse on environmental education. However, the literature discussing this topic finds some problematic trends, which ensure Western science remains the authoritative knowledge system (Charter, 2004). These concerns are associated with both the intent of including knowledge systems other than Western science and, in turn, the process by which they are included. The recent interest in non-Western knowledge systems is, in some instances, to gain an understanding of natural resource management and biodiversity to be able to alleviate Western environmental problems (Huggan, 2001). Where this holds true, the inclusion of such knowledge systems may be based on its "translatibility," that is the ability to remove the relevant knowledge from its original historical and cultural context and integrated into a Western understanding of the environment (Carter, 2004). The translation of diverse knowledge systems to conform to, and/or be verified by Western science undermines the inherent worth of such systems and suggests they are inferior.

This concept of translating alternative knowledge systems to fit within Western science and to serve the purpose of alleviating Western concerns is extremely difficult to analyse in both UNESCO's historical discourse and the Ontario elementary science and technology curriculum. This is due to the limited number of references to such knowledge systems. However, let us

begin with the Ontario elementary science and technology curriculum, as there is one quote which I perceive as a clear illustration of ensuring “translatability” in the inclusion of non-Western knowledge systems. The curriculum requires students to “look at the perspectives or world views of Aboriginal cultures as they relate to science and technology” (p. 37). Thus, only perspectives that fit, or are translatable, within Western-science are to be considered.

I also perceive the attempt to translate the diverse knowledge systems recognized in UNESCO’s discourse. Evidence of this is seen in a statement from *Agenda 21*, which recommends governments “affirm the rights of indigenous peoples, by legislation if necessary, to use their experience and understanding of sustainable development to play a part in education and training” (p. 3). I suggest that this recommendation may result in the translation of indigenous knowledge in order to fit within the Western concept of sustainable development.

Again, there is not a great deal of evidence to support my claim that non-Western knowledge systems only appear in the discourse when they are “translatable.” However, in the few instances where non-Western knowledge systems are referenced in both UNESCO’s discourse and the Ontario elementary science discourse, they are related to Western science.

### ***Summary of the Postcolonial Analysis***

From this postcolonial reread, we see that Ontario reinscribes the ideologies which I perceive to be associated with UNESCO’s concept of *education for sustainable development*. First, both the discursive trends related to this concept and the Ontario elementary science and technology curriculum, challenge the binary thinking of colonialism. Second, UNESCO’s discourse and the curriculum document, in similar ways, work toward decolonizing our relationship with nature, through valuing the establishment of one’s relationship with nature and developing a sense of community. Finally, both discourses fail to challenge, to any significant extent, the assumed

linear progress of Western science. In the following chapter I provide a more thorough summary as I discuss my finding in the context of my analysis as a whole.

## CHAPTER SEVEN: IMPLICATIONS, LIMITATIONS AND CONCLUSION

The purpose of this final chapter is to present the contributions of this study. The chapter is organized into five separate but interconnected parts. In the first section I summarize the study's findings. Next, I discuss these findings in relation to the existing literature on environmental education and curriculum studies. In the third section, I discuss the implications of this study for educators and future researchers. The fourth section discusses a number of the limitations of the study, which must be considered alongside its contributions. I end this chapter with my concluding remarks.

### *Summary*

My analysis indicates a shift in the underlying purpose of education in UNESCO's discourse as the term *education for sustainable development* emerged. I have shown that *environmental education* appears to focus primarily on shaping cultural values and attitudes. *Education for sustainable development* on the other hand, is focused mainly on developing an effective and efficient workforce, and thus centres on economic production. The term *environmental education* in the Ontario elementary science and technology curriculum creates a space for the discussion of environmental issues from multiple perspectives. This indicates that the underlying purpose of the Ontario Ministry of Education's concept of *environmental education* is to foster decision-making skills that take into account numerous viewpoints. I thus conclude, that the curriculum does not reinscribe UNESCO's belief on the purpose of *environmental education/education for sustainable development*.

However, the postcolonial deconstruction of this key concept reveals that the curriculum's discourse may be more closely aligned to UNESCO's than I thought upon my initial analysis. UNESCO promotes an education focused on economic production, which works

to challenge aspects of colonization by working to distribute decision-making throughout all levels of the workforce. Similarly, the Ontario elementary science and technology curriculum, though employing a different means, also resists hegemonic aspects of education that are viewed by curriculum scholars as colonizing. In the case of the curriculum, it is through encouraging critical awareness and diversity that the colonizing trend of binary thinking is disrupted.

The second key concept that emerged from UNESCO's discourse is the significance of *place* within environmental education. In UNESCO's earliest discourse *place* did not seem to be highly valued as a key aspect of environmental education. However, simultaneously with the emergence of the term *sustainable development*, more focus began to be put on the needs of communities and collective action. Drawing on scholarly literature, I suggest that both foci can work to foster one's relationship with *place*. The value of fostering relationships with one's surroundings is reinscribed in Ontario elementary science and technology curriculum which maintains a focus on community needs as well as having students explore their natural world.

The postcolonial analysis of *place* reveals that the way in which both UNESCO and the Ontario elementary science and technology curriculum discuss *place*, works to decolonize society's colonizing relationship with nature. This is done primarily through promoting the development of community identity.

The role of Western science in environmental education emerged as the third key concept. Neither UNESCO nor the Ontario elementary science and technology curriculum seemed to completely embed their approach to environmental education/education for sustainable development in Western science. UNESCO encouraged the employment of an interdisciplinary approach throughout their historical discourse. This was seen in part through the continual questioning of the implications of scientific advancements. Such an approach appeared

to be reinscribed in the Ontario curriculum. Though I examined the science and technology curriculum, the discourse appears to encourage the students to consider and discuss environmental issues not solely drawing on scientific knowledge but also their previous lived-experiences. Similarly to UNESCO's approach, the curriculum appears to continually question the implications of scientific advancements on various aspects of society which again shows that the Ontario elementary science and technology curriculum is working to reinscribe UNESCO's discursive trends in terms of the role of Western science.

The postcolonial deconstruction of this key concept indicates that though both UNESCO's discourse and the curricular discourse encourage the consideration of knowledge systems beyond Western-science they both do so in a way that undermines the diversity of alternative knowledge systems. In both discourses alternative science systems are only encouraged in situations where they can be translated into Western science. This in turn undermines the diversity of perspectives brought from different ways of constructing knowledge and explaining the environment. I explore the implications of this later in this section where I discuss the colonizing and decolonizing discursive trends identified during this study.

### ***Connection to Existing Literature***

The initial literature review, found in Chapter two, revealed that many scholars were critical of UNESCO's employment of the terms *sustainability* and *sustainable development*. My research is in agreement with these scholars who maintain that these terms are never explicitly defined leading to ambiguities (see Bonnett, 2007; Higgin & Kirk, 2006; Higgitts, 2006; Jicklings, 1994). However, my findings challenge the belief that *sustainable development* promotes the environment solely as a resource to be exploited for human gains (see Higgitts, 2006; Jicklings, 1994; Stables, 2002). My in-depth consideration of the discourse indicates that UNESCO's

concept of *education for sustainable development* in actuality works to create a nuanced connection between communities and the environment which supports them.

Furthermore, my findings reveal that we cannot simply deduce that one term is a “much richer and more profound” way of educating society on environmental issues, as Bonnett (2007) suggests *environmental education* is, in comparison to *education for sustainable development* (p. 719). Rather, we must consider the context and the discourse in which the term is embedded. The context, not the term itself, governs the richness and profoundness of any given approach to educating on environmental issues. This is seen in my analysis. UNESCO’s concept of *education for sustainable development* values one’s connection with place to a greater degree than their concept of *environmental education*. However, this connection with place is also promoted in the Ontario Ministry of Education’s concept of *environmental education*. Thus, we cannot make immediate assumptions on the terminology employed.

My research also further supports the scholarly literature which suggests environmental education must be regionally/locally focused (see Bowers, 1995; Brookes, 2002; Gruenwald 2004a; Stables, 2004). The postcolonial deconstruction of *place responsiveness* furthers the discussion on the role of place in environmental education. In this section of my research, I expose the importance of considering one’s place if we are to restore the deep disruption of place-based relationships caused by colonialism which have lead us to colonize our environment. However, my postcolonial analysis has revealed that including traditional knowledge systems in education on environmental issues may not be enough. If traditional knowledge is being utilized only in situations where it can be translated into the Western scientific knowledge system it may undermine the diversity of the knowledge system at hand. This is an argument that was absent in the scholarly writing I examined in my initial literature review. Thus, we see that, though in

many instances my research simply reiterates the literature in the fields, in some instances it adds to the discussion and in other instances it challenges the literature.

### *Implications*

By grounding my work in curriculum theory, I attempt to complete the task of a curriculum theorist, which Ng-A-Fook (2007) explains is to “make inquiries into a critique of past and present colonial and curricular landscapes in order to understand and improve the processes of teaching and learning” (p. 17). I draw on the intersection of the verticality, or the historical discourse, with the present day circumstances. Though my initial analysis provides valuable information, I realize it is the act of deconstruction, drawing on postcolonial theory, which succeeds in facilitating the aforementioned task of a curriculum theorist.

The implications of this study cannot be reduced to a linear equation. Though I state that UNESCO’s discourse promotes a decolonizing (or colonizing) discourse, which the Ontario curricular discourse should work to reinscribe (or subvert). The landscape of each discourse analyzed in its own way leads to both colonizing and decolonizing trends. Each discourse sheds its own light on the complexities of educating our youth about the current state of our environment. The deconstruction of each discourse has implications on how we perceive the historical, current and future state of environmental education, both globally and locally.

I now look at what lessons can be learned from the analysis. I state again that curriculum theory is not aimed at presenting practical solutions. Rather, it attempts to gain a more nuanced understanding of complex relationships, including the contradictions between global and local discourses (Gough, 2003). I discuss advancements that might work toward establishing a discourse which decolonizes various relationships. In turn, my analysis hopes to lead scholars and educators to a more nuanced understanding of environmental education discourse.

### *Colonizing Trends*

First, let us look at the discursive trends that I identify as being of colonial or neo-colonial nature. Four such trends have emerged through the unravelling of my initial analysis employing postcolonial literature.

The first colonizing trend is that of cultural production, which dominates the first two landmark documents associated with UNESCO's concept of *environmental education* but not with the concept of *education for sustainable development*. This questions and contradicts the scholarly works aforementioned in my initial literature review, which remains highly critical of the term *education for sustainable development* but not of *environmental education* (see Bonnett, 2007; Jicklings, 1994; Stables, 2004). Though my findings parallel some of the problems discussed in relation to the *education for development*, I caution against what I suggest as the blind praise for the initial term/concept of *environmental education*. In UNESCO's historical discourse, *environmental education* is employed to shape neutralizing global ethics, which does not lead to the "richer and more profound" curriculum that Bonnett (2007) associates with the term.

The second colonizing trend is again linked to UNESCO's concept of *environmental education*. The approach associated with this concept further strains the already disrupted relationships we have with our environment. By thinking globally, we distance ourselves from our local surroundings, leading to a broader and more general awareness, not the nuanced understanding essential for decolonizing how we interact with our surroundings.

The promotion of disciplinary boundaries is the third colonizing trend, as it leads to the privileging of Western epistemologies. By placing disciplinary boundaries as a central component of education, Western knowledge is placed in a position of authority. UNESCO is a

multinational body and the assumed approach to education and to the construction of knowledge is a colonizing discourse. These assumptions are particularly prevalent in the discursive trends associated with the concept of *education for sustainable development*.

Though scholars indicate that the inclusion of non-Western knowledge systems can work to decolonize the discourse on environmental issues, postcolonial theorists caution the rationale for these acknowledgements and the process of inclusion are of equal importance. If alternative knowledge systems are incorporated into the discourse in a manner that is synchronized with Western science, the process may support the colonizing tendency of privileging Western knowledge. For curriculum scholars, this indicates the importance of considering the hidden curriculum within the curricular discourse.

In summary, colonialism has led to problematic relationships between societies and their environment through endorsing nature as solely a resource to be exploited for political and economic gains (Adams & Mulligan, 2002; Bowers 1995; Brookes 2002; Gruenewald, 2004a; and Stables, 2004). If curricular discourse is to work toward overcoming our current environmental crisis, it must challenge our colonizing interactions with the environment (Bowers, 1995; Orr 1996; Gruenewald, 2004a). Educators and curriculum theorists must work together to eliminate these colonizing trends from our curriculum landscape. Let us now consider the following trends, which accomplish this.

### *Decolonizing Trends*

In this section, I would like to draw attention to two trends that subvert the colonizing discourse mentioned above. For me, these trends indicate the possibilities of education on/for the environment, regardless of the term employed.

I begin with the discourse that challenges binary thinking. Let us recall that scholars such as Ashcroft (2001) and Fuller (2000) maintain that binary thinking is the most durable aspect of colonization. Thus, fostering a discourse, which promotes the co-construction of knowledge through lived-experiences of an individual or a collective, can lead to a decolonizing trend. In turn, questioning and exploring our complex understanding of the places we inhabit can transform the colonized way we interact with these surroundings (Adam & Mulligan, 2003; Plumwood, 2002). We may begin to consider an intrinsic value of the environment rather than resources for political and economic exploitation.

In UNESCO's final document, we see the development of decision-making skills move to the forefront of the discourse. This, combined with the omission of developing a global culture blindly, as previously promoted, indicates that the discourse is moving beyond the hegemonic practices which result in binary thinking. A similar trend also emerges from the Ontario elementary science and technology curriculum, which introduces the curriculum in a manner that creates a space for students to co-construct their knowledge on environmental issues.

The second trend I would like to consider also works to decolonize our relationship with the environment. Both UNESCO's concept of *education for sustainable development* and the Ontario elementary science and technology curriculum promote an approach to environmental issues focused foremost on one's local community. Scholars such as Bowers (2004), Orr (1994) and Plumwood (2002) maintain that this approach leads to a nuanced understanding of one's connection to their surroundings. This, in turn deepens their connection to place, a connection which was weakened as a result of colonialism.

### *Final Implications*

The deconstruction of UNESCO's last two landmark documents and the Ontario science and technology curriculum led me to perceive that both discourses work to create a deep understanding of the environment and the ability to apply knowledge critically. This is despite UNESCO's employment of the term *education for sustainable development* and the Ministry of Education's use of the term *environmental education*. Yet, Jickling (1994) and others maintains that *education for sustainable development* fails to foster either a deep understanding or the skill to apply knowledge critically. Therefore, one final implication of this study is the confirmation that there is value in deconstructing a discourse, as this process can subvert the generalizations blindly associated with specific terminology and language. Curriculum scholars and educators should not consider only the terms employed, but look beyond to the intricacies of how the language shapes meaning.

### *Limitations of the Study*

Despite sustained efforts throughout the process of developing my research proposal to reduce ambiguity and possible concerns, there nonetheless remain several limitations to this project. First, studying the curricular text reveals only the curricular content, and not what the curriculum achieves in practice through the lived-experiences within any given classroom (Apple, 1990; Ross, 2007). Despite this particular limitation, there is still reason to study curricular policy documents. "Official curriculum," as Ross (2007) explains, "express what is valued for one reason or another in society" (p. 662).

A second limitation lies in my use of postcolonial theory as a methodological filter. I am studying postcolonial theory from within a Western university, which is in and of itself a dominant institution (Moore-Gilbert, 1997; Brydon, 2000). Not only am I situated within a

Western institution, as a white female I am also deeply rooted within the privileges incurred in a Eurocentric society. However, let us recall that I utilized postcolonial theory in part to bring the familiar into fresh light. By remaining observant of my personal position, I developed the desired unfamiliarity despite working from within a dominant culture and institution.

### ***Conclusion***

“The West abused the environment to get ahead and now you are telling us we cannot do the same.”

My colleague’s comments suggest there is a deep unease surrounding the connectedness of global and local environmental issues, especially in relation to our current environmental crisis. Despite such tensions and recognizing that sociocultural context influences one’s perception of the environment, UNESCO has functioned with the intent to shape local environmental education curricula. At the beginning of this study I raised the question:

How do the discursive trends represented within the Ontario elementary science and technology curriculum work to reinscribe and/or subvert UNESCO’s historical discourse on the concept of *education for sustainable development*?

My findings lead to the answer which I summarized earlier in this final chapter, that some ideologies are reinscribed while others are subverted. However, in conclusion I believe that what is important is not whether or not UNESCO’s dominant discourse on environmental education is reinscribed and/or subverted in the discursive trends of local curriculum, specifically those found in the Ontario elementary science document. Rather, we should consider how both discourses contribute to the complicated discussion on environmental education. This conclusion results from my postcolonial deconstruction which exposed that some aspects of UNESCO’s discourse works to decolonize our relationship with nature and challenge colonialism, while others reaffirm colonial trends. Likewise, this statement holds true for the Ontario elementary science and technology curriculum. As I conducted this study I came to the realization that in order to

advance the possibilities of environmental education we must focus foremost on the decolonizing trends presented by both discourses. I urge that this approach, rather than a comparative approach, will lead to a more fruitful discussion.

More broadly, I hope I have advanced our understanding of the colonizing or decolonizing discursive trends present in UNESCO's dominant discourse and within local curriculum policy documents. Locally, the study contributes to the current conversation within the Ontario Ministry of Education and among curriculum theorists in regards to the province's new strategies for integrating environmental education within its schooling system.

## REFERENCES

- Adams, W.M. (1992). *Wasting the rain: rivers, people and planning Africa*. Sterling, VA: Earthscan Publications.
- Adams, W.M. (2002) *Green development: environment and sustainability* (2<sup>nd</sup> Ed.). New York: Routledge.
- Adams, W.M. (2003) *Future nature: a vision for conservation* (2<sup>nd</sup> Ed.). Sterling, VA: Earthscan Publications.
- Adams, W.M. (2004). *Against extinction: The story of conservation*. Sterling, VA: Earthscan Publications.
- Adam, J., Luitel, C., Afonso, E. & Taylor, P. (2008). A Cogenerative Inquiry Using Postcolonial Theory to Envisage Culturally Inclusive Science Education. *Cultural Studies of Science Education*, 3, 999-1019.
- Adams, W.M., & Mulligan, M. (2003). *Decolonizing nature: Strategies for conservation in a post-colonial era*. Sterling, VA: Earthscan Publications.
- Altbach, P.G. (1995). Education and neocolonialism. In B. Ashcroft, G.Griffiths & H. Tiffin (Eds.), *The post-colonial studies reader* (pp. 452-456). New York: Routledge.
- Althusser, L. (1971). *Lenin and philosophy and other essays*. New York: Monthly Review Press.
- Apple, M. (1990/1979). *Ideology and Curriculum*. New York: Routledge.
- Apple, M. (1995). *Education and Power*. New York: Routledge.
- Ashcroft, B. (2001). *Post-colonial transformation*. New York: Routledge.
- Ashcroft, B., Griffiths, G., Tiffin, H. (1989). *The empire writes back: Theories and practice in postcolonial literature*. New York: Routledge.
- Bell, C., & Russell, C. (2000). Beyond human, beyond words: Anthropocentrism, critical pedagogy, and the poststructuralist. *Canadian Journal of Education*, 25(3), 188-203.
- Bennell, P. & Sergerstrom, J. (1998). Vocational Education and Training in Developing Countries: Has the World Bank got it right? *International Journal of Educational Development*, 18(4), 271-87.
- Bonnett, M. (2007). Environmental education and the issue of nature. *Journal of Curriculum Studies*, 39(6), 707-721.
- Bowers, C.A. (1990). Educational Computing and the Ecological Crisis: Some questions about curriculum priorities. *Journal of Curriculum Studies*. 22(1),
- Bowers, C.A. (1995). Ecological challenges in the third millennium: Some reflections on Paquette's priorities. *Curriculum Inquiry*, 25 (1), 57-69.
- Bowers, C.A. (2001). *Educating for eco-justice and community*. Athens: University of Georgia Press.
- Bowers, C.A. (2000). *Let Them Eat Data: How computers affect education, cultural diversity, and the prospects of ecological sustainability*. University of Georgia Press.
- Bower, C.A. (2004). Comments on David Gruenewald's "A Foucauldian Analysis of Environmental Education". *Journal of Curriculum Inquiry*, 34 (2), 223-232.
- Britzman, D. P. (1995). Beyond innocent readings: Educational ethnography as a crisis of representation. In W. T. Pink & G. W. Noblit (Eds.), *Continuity and contradiction: The futures of the sociology of education* (pp. 133– 156). Cresskill, NJ: Hampton Press.

- Brookes, A. (2002). Lost in the Australian bush: Outdoor education as curriculum. *Journal of Curriculum Studies*, 34 (4), 405-425.
- Brydon, D. (2000). *Introductions*. In D. Brydon (Ed.), *Postcolonialism: Critical concepts* (pp. 1-23). New York: Routledge.
- Burke, B. (2005). Antonio Gramsci, Schooling and Education. *The encyclopaedia of Information*, Retrieved May 2009 from [www.infed.or/thinker/et-gram.htm](http://www.infed.or/thinker/et-gram.htm).
- Cameroon, J. (2003). Education for Place in a Postcolonial Era: An Australian perspective on ethical practice. *Ethics, Place and Environment*, 6 (2), 99-115.
- Carter, L. (2004). Thinking Differently About Cultural Diversity: Using postcolonial theory to (re)read science education. *Science Education*, 88, (6), 819-836.
- Carter, L. (2005). A Place for Alternative Readings: Can they be of use? Responding to comments on "thinking differently about cultural diversity: Using postcolonial theory to (re)read science education." *Science Education*, 89 (6), 913-919.
- Chambers, C. (2003). "As Canadian as Possible Under the Circumstances": A View of Contemporary Curriculum Discourses in Canada. In W. F. Pinar (Ed.), *International Handbook of Curriculum Research*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Cjete, G. (1994). *Look to the Mountain: An Ecology of Indigenous Education*. Durango, CO: Kivaki Press.
- Clayton, T. (1998). Beyond Mystification: Reconnecting World-System Theory for Comparative Education. *Comparative Education Review*, 42 (4), 479-496.
- Cotton, D.R.E. (2006). The Implementing Curriculum guidance on environmental education: the importance of teachers' beliefs. *Journal of Curriculum Studies*, 38 (1).
- Creswell, J. (2007). *Qualitative Inquiry and Research Design (2<sup>nd</sup> Edition)*. Thousand Oaks, California: Sage Publications.
- Crossley, M. & Tikly, L. (2004). Postcolonial perspectives and comparative and international research in education: a critical introduction. *Comparative Education Review*, 47(3), 147-156.
- Davis, B. (1996). *Teaching Mathematics: Toward a sound alternative*. New York: Garland Publishing.
- Davis, B. & Sumara, D. (2006). *Complexity and Education: Inquiries into learning, teaching and research*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Eg ea-Kuehne, D. (1995). Deconstruction Revisited and Derrida's Call for Academic Responsibility. *Educational Theory*, 45 (3), pp. 293-309.
- Emerson, R., Fretz, R., & Shaw, L. (1995). *Writing ethnographic fieldnotes*. Chicago: The University of Chicago Press.
- Fairclough, N. (2004). Semiotic Aspects of Social Transformation and Learning. In R. Rogers (Ed.), *An introduction to critical discourse analysis in education* (pp.225-236). Mahwah, NJ: Lawrence Erlbaum Associates.
- Forge, F. (2007). Biofuels - An Energy, Environmental or Agricultural Policy? Retrieved April, 2009 from website: [www.parl.gc.ca/information/library/PRBpubs/prb0637-e.htm](http://www.parl.gc.ca/information/library/PRBpubs/prb0637-e.htm).
- Foucault, M. (1972). *The Archaeology of Knowledge*. New York: Tavistock Publications Limited.
- Foucault, M. (1978). *The History of Sexuality: An introduction*. New York: Random House.
- Fuller, G. (2000). The Textual Politics of Good Intentions: Critical theory and semiotics. In A. Lee & C. Poynton (Eds.), *Culture and text, discourse and methodology in social research and cultural studies* (pp. 81 - 90).

- Gayford, C.G. (1986). Environmental education and the secondary school curriculum. *Journal of Curriculum Studies*, 18(2), 147-157.
- Gee, J. P. (1996). *Social Linguistics and Literacies: Ideology in discourse*. New York: Routledge.
- Gee, J. P. (2004). Discourse analysis: What makes it critical? In R. Rogers (Ed.), *An introduction to critical discourse analysis in education* (pp.19-50). Mahwah, NJ: Lawrence Erlbaum Associates.
- Giroux, H. (1990). Perspectives and Imperatives: Curriculum theory, textual authority, and the role of teachers as a public intellectual. *Journal of Curriculum and Supervision*, 5 (4), 361-383.
- Giroux, H. (2001). *Theory and resistance in Education: Toward a pedagogy for the opposition*. Westport, CA: Bergin & Garvey.
- Giroux, H. and Trend, D. (1992). Cultural Workers, Pedagogy and the Politics of difference: Beyond cultural conservatism. *Cultural Studies*, 6 (1), p. 51-72.
- Glasson, G., Frykholm, N., & Mhango, A. (2006). Understanding the Earth Systems of Malawi: Ecological sustainability, culture, and place-based education. *Science Education*, 90 (4), 660-680.
- Greene, M. (2008, March). *Key note Address at the American Association for the Advancement of Curriculum Studies*. Speech presented at Columbia University, New York.
- Gruenewald, D. (2003a). The Best of Both Worlds: A critical pedagogy of place, *Educational Researcher*, 32 (4), 3-12.
- Gruenewald, D. (2003b). Foundations of Place: A multidisciplinary framework for place-conscious Education. *American Educational Research Journal*, 40(3), 619-654.
- Gruenewald, D. (2004a). A Foucauldian analysis of environmental education: Toward the socioecological challenge of the Earth Charter. *Curriculum Inquiry*, 34(1), 71-107.
- Gruenewald, D. (2004b). Why the Earth Charter matters to (multi) cultural educators everywhere: A rejoinder. *Curriculum Inquiry*, 34(2), 241-250.
- Gough, A. (1993). Globalizing Environmental Education: What's Language Got to Do with It? *Journal of Experiential Education*, 16(3), 32-39.
- Gough, A. (1999). Recognising women in environmental education pedagogy and research: Toward an ecofeminist poststructuralist perspective. *Environmental Education Research*, 5, 143-161.
- Gough, A, & Gough, N. (2006). Decolonizing Environmental Education Research: Stories of queer(y)ing and destabilising. *Presented at the University of Bath*, found at [www.bath.ac.uk](http://www.bath.ac.uk), April, 2009.
- Gough, N. (2002) Thinking/acting locally/globally: Western science and environmental education in a global knowledge economy. *International Journal of Science Education* 24(11), 1217-1237.
- Gough, N. (2003). Thinking globally in environmental education: Implications of internationalizing of curriculum inquiry. In W. Pinar (Ed.), *International handbook of curriculum research* (pp. 53-70). Mahwah, NJ: Lawrence Erlbaum Associates.
- Gough, N & Gough, A. (2003). Decolonising environmental education research: Stories of queer(y)ing and destabilising. *Draft paper presented at the University of Bath, 6 August 2003*. Retrieved May, 2008, from [www.bath.ac.uk/cree/resources/goughs.doc](http://www.bath.ac.uk/cree/resources/goughs.doc).

- Gradle, S. (2007) A spiritual ecology: Finding the heart of art education. *Journal of the Canadian Association for Curriculum Studies*, 5(1), 71-93.
- Hammersley, M. & Atkinson, P. (1997). *Ethnography (2<sup>nd</sup> Edition)*. New York: Routledge.
- Harvey, D. (1989). *The condition of postmodernity: An enquiry into the origins of cultural change*. Malden, MA: Wiley-Blackwell.
- Hewson, M.G. (1988). The Ecological Context of Knowledge: Implications for learning science in developing countries. *Journal of Curriculum Studies*. 20 (4), 317-326.
- Higgins, P. & Kirk, G. (2006). Sustainability education in Scotland: The impact of national and international initiatives on teacher education and outdoor education. *Journal of Geography in Higher Education*, 30(2), 313-326.
- Higgitt, D. (2006). Finding space for education for sustainable development in the enterprise economy. *Journal of Georgraphy in Higher Education*, 30(2), 251-262.
- Hodson, D. (2003). Time for action: science education for an alternative future *International Journal of Science Education*, 25 (6), 645-670.
- Huebner, D. (1961). Is the curriculum adequate. In W.F.Pinar (Ed.) 1999. *The lure of transcendent: Collected essays by Dwayne E. Huebner*. Mahwah, NJ: Lawrence Erlbaum Associates
- Huggan, G. (2001). *The Postcolonial Exotic*. New York: Routledge.
- International Monetary Fund, (2009). *World Economic Outlook: Crisis and Recovery*. Retrieved September, 2009, from [www.imf.org/external/pubs/ft/weo/2009/01/pdf/text.pdf](http://www.imf.org/external/pubs/ft/weo/2009/01/pdf/text.pdf).
- Janks, H. (1997). Critical discourse analysis as a research tool. *Discourse: Studies in the Cultural Politics of Education*, 18(3), 27-48.
- Jardine, D. (2000). *Under the Tough Old Stars: Ecopedagogical Essays*. Brandon: The Foundation for Educational Renewal, Inc.
- Jickling, B. (1994). Studying sustainable development: Problems and possibilities. *Canadian Journal of Education*, 19(3), 231-240.
- Jickling, B., & Wals, A. (2008). Globalization and environmental education: Looking beyond sustainability and sustainable development. *Journal of Curriculum Studies*, 40(1), 1-21.
- Johnson, M. (1967). Definitions and Models in Curriculum Theory. *Educational Theory*, 17(2), pp. 127-140.
- Kanu, Y. (2006). *Curriculum as Cultural Practice: Postcolonial imaginations*. Toronto: University of Toronto Press.
- Kelsey, E. (2003). Constructing the public: Implications of the discourse of international environmental agreements on conceptions of education and public participation. *Environmental Education Research*, 9(4), 403-427.
- Kuhn, R. L. (2003). Science as democratizer. *American Scientist*, 91, 388.
- Lather, P. (1991). *Getting smart: Feminist research and pedagogy within the postmodern*. New York: Routledge
- Lauglo, J. (1996). Banking on Education and the users of research a critique of: World Bank priorities and strategies for education. *Internation Journal of Educational Development*, 16(3), 221-233.
- Leach, F. (2000) Gender implications of development agency policies on education and training. *International Journal of Educational Development*, 20(4), 333-347.

- London, N. (2003). Ideology and Politics in English-Language Education in Trinidad and Tobago: The Colonial Experience and a Postcolonial Critique. *Comparative Education Review*, 47(3), 287-320.
- Loomba, A. (1998). *Colonialism/Postcolonialism*. New York: Routledge.
- Louv, R. (2005). *The Last Child in the Woods*. New York: Workman Publishing.
- Lucas, T. (2002). Preparing Culturally Responsive Teachers. *Journal of Teacher Education*, 53(1), 20-32.
- Marshall, J.D, Sears, J.T., & Schubert, W.F. (2002). *Turning points in curriculum*. New Jersey: Prentice-Hall.
- McGregor (2004). *Critical Discourse Analysis—A Premier*. Retrieved February 2009 from website: [www.gslis.utexas.edu/~palmquis/courses/discourse.htm](http://www.gslis.utexas.edu/~palmquis/courses/discourse.htm).
- McLaren, P. (1989). *Life in Schools: An Introduction to critical pedagogy in the foundation of education*. White Plains, NY: Longman.
- McKinley, E. & Aikenhead S. (2005). Comments on “Thinking Differently About Cultural Diversity: Using Postcolonial Theory to (Re)read Science Education.” *Science Education*, 89 (6), 901-906.
- Moore-Gilbert, B. (1997). *Postcolonial theory: Context, practices, politics*. New York: Verso.
- Morris, M. (2002). Ecological consciousness and curriculum. *Curriculum Studies*, 34 (5), 571-587.
- Ng-A-Fook, N. (2007). *An Indigenous Curriculum of Place: The United Houma Nations' Contentious Relationship with Louisiana's Educational Institutions*. New York: Peter Lang.
- Ng-A-Fook, N. (2008). Provoking Historical and Intellectual Topographies of Environmental Education within Canadian Curriculum Studies. *Social Studies and Humanities Research Council, Submitted Fall 2008*.
- Ontario Ministry of Education. (2007). *Shaping our schools shaping our future: Environmental education in Ontario schools*. Toronto: Queen's Printer for Ontario.
- Ontario Ministry of Education. (2007). *The Ontario Curriculum Grade 1-8: Science and Technology*.
- Orr, D. (1994). *Earth in mind: On education, environment, and the human prospect*. Washington, DC: Island Press.
- O'Sullivan, B. (1999). Global change and educational reform in Ontario and Canada. *Canadian Journal of Education*, 24(3), 311-325.
- Palmer, J. (1998). *Environmental Education in the 21<sup>st</sup> Century: Theory, Practice, Progress and Promise*. New York: Routledge.
- Pinar, W.F., Reynolds, W.M, Slattery, P. & Taubman, P. M. (1995). *Understanding Curriculum*. New York: Peter Lang.
- Pinar, W.F. (2004). *What is Curriculum Theory?* New Jersey: Lawrence Erlbaum Associates.
- Pinar, W.F. (2006). *The Synoptic Text Today and Other Essays*. New York: Peter Lang.
- Pinar, W.F. (2007). *Intellectual Advancement through Disciplinarity: Verticality and Horizontality in Curriculum Studies*. Rotterdam: Sense Publishing.
- Phelan, A. (2004). Rationalism, Complexity Science and Curriculum: A cautionary tale. *Complicity: An International Journal of Complexity and Education*, 1 (1), 9-17.
- Philips, N. & Hardy, C. (2002). *Discourse Analysis: Investigating processes of social construction*. London: Sage Publications.
- Plumwood, V. (1993). *Feminism and the Mastery of Nature*. New York: Routledge.

- Plumwood, V. (2002). *Environmental culture: The ecological crisis of reason*. New York: Routledge.
- Prasad, A. (2003). The gaze of the other: Postcolonial theory and organizational analysis In A. Prasad (Ed.), *Postcolonial theory and organizational analysis: A critical engagement*. New York: Palgrave Macmillan.
- Rissom, H. (1992). UNESCO and the new Europe. *International Review of Education*, 38(6), 700-705.
- Ripley, D. (2008). The Green Incentive: Biofuels incentive programs in Canada. *Bioenergy Canada, December/January 2008*, www.bioenergymagazine.ca.
- Robertson, S. L. (2005). Re-imagining and Rescripting the Future of Education: Global knowledge economy discourses and the challenge to education systems, *Comparative Education*, 41(2), pp. 151-170.
- Rodriguez, A. (1998). Strategies for Counter Resistance: Toward sociotransformative constructivism and learning to teach science for diversity and for understanding. *Journal of Research in Science Teaching*, 35 (6).
- Rogers, R. (2004). An introduction to critical discourse analysis in education. In R. Rogers (Ed.), *An introduction to critical discourse analysis in education* (pp.1-15). Mahwah, NJ: Lawrence Erlbaum Associates.
- Ross, H. (2007). Environment in the curriculum: Representation and development in the Scottish physical and social sciences. *Journal Curriculum Studies*, 39(6), 659-677.
- Sauve, L. (1996). Environmental education and sustainable development: A further appraisal. *Canadian Journal of Environmental Education*. 1, 7-33.
- Sauve, L. (2007). Three decades of international Guidelines for environment-related education: A critical hermeneutic of the United Nations discourse. *Canadian Journal of Environmental Education*, 12(1), 33-54.
- Scott, W., & Oulton, C. (1999). Environmental education: Arguing the case for multiple approaches. *Educational Studies*, 25(1), 89-99.
- Snively, G., & Corsiglia, J. (2005). Response to Carter's Postmodern, Postcolonial Analysis of Snively and Corsiglia's (2000) Article "Discovering Science." *Science Education*, 89 (6), 907-912.
- Sumara, D., Davis, B., & Laidlaw, L. (2001). Canadian identity and curriculum theory: An ecological, postmodern perspective *Canadian Journal of Education*, 26 (2), 144-163.
- Stable, A. (2004). Can education save the world? A response to David Gruenewald. *Curriculum Inquiry*, 34(2), 233-240.
- Suzuki, D. (2004, April). *Implications of Offshore Oil Exploration*. Speech presented in Vancouver, BC.
- Tikly, L. (1999). Postcolonialism and Comparative Education. *International Review of Education*, 45 (5-6), 603-621.
- Tikly, L. (2001). Globalisation and Education in the Postcolonial World: Towards a conceptual framework. *Comparative Education*, 37 (2), 151-171.
- Tilbury, D. (1992). Environmental education within pre-service teacher education: The priority of priorities. *International Journal of Environmental Education and Information*, 11(4), 267-280.
- Troop, A.J. (2006). *Natures of colonial change: Environmental relations in the making of the Transkei*. Athens, Ohio: Ohio University Press.

- UNESCO, (1975). *The Belgrade charter*. Belgrade: UNESCO-UNEP.
- UNESCO, (1977). *Intergovernmental Conference on Environmental Education*. Tbilisi: UNESCO-UNEP.
- UNESCO, (1988). *International strategy for action in the field of environmental education and training for the 1990s*. Paris: UNESCO-UNEP.
- United Nations. (1992). Chapter 36. *United Nations Conference on Environment and Development: Agenda 21*. Rio de Janeiro: UNCED.
- UNESCO, (2008). UNESCO, 2008. *History of Environmental Education: Four Fundamental Documents*. Retrieved May, 2008, from <http://portal.unesco.org/education/en/ev201.html>.
- Willis, P. (1981). *Learning to Labour: How working class kids get working class jobs*. New York: Columbia University Press.
- Willis, P. (2003). Foot soldiers of modernity: The dialectics of cultural consumption and the 21<sup>st</sup> century schools. *Harvard Educational Review*, 73(3), 390-415.
- Woodside-Jiron, H. (2004). Language, power, and participation: Using critical discourse analysis to make sense of public policy. In R. Rogers (Ed.), *An introduction to critical discourse analysis in education* (pp.173-206). Mahwah, NJ: Lawrence Erlbaum Associates.
- World Commission on Environment and Development, (1987). *Our common future*. Geneva: General Assembly.

## APPENDIX A

### *Summary of Initial Coding of the UNESCO Landmark Documents*

<i>The Belgrade Charter</i> (1975)	<i>Intergovernmental Conference on Environmental Education</i> (1977)	<i>International Strategy for Action in the Field of Environmental Education and Training for the 1990s</i> (1987)	<i>Agenda 21, Chapter 36</i> (1992)
---------------------------------------	--	---	--

### *Concept of "The Environment"*

The environment in its totality – natural and man-made, ecological, political, economic, technological, social, legislative, cultural and aesthetic.  
(p. 4)

...but the concept of environment had evolved: initially confined to its physical and biological aspects, it now also covered the social, economic and technological environment.  
(p. 6)

Since the Tbilisi Conference, the environment has been seen as a whole, simultaneously comprising natural aspects and those that result from human action.  
(p. 2)

There is now agreement that the environment embraces social and cultural, as well as physical, environment and analyses therefore must take into account interrelations between the natural environment, its biological components and social and cultural factors as well. In addition, environmental problems... include problems of underdevelopment, such as inadequate housing and shelter, bad sanitary conditions, malnutrition, defective management and production practices and, more generally, all problems which stem from poverty. **They also include questions of protecting cultural and historical heritages.**  
(p. 11)

Noting that the concept of “the environment” includes a complex of natural, built and social components and that the social components constitute a set of cultural, moral, personal values and interrelations of people in the spheres of labour and leisure activities...  
(p. 26)

### ***Aim of Environmental Education***

The goal of environmental education is: To develop a world population that is **aware of, and concerned** about, the environment and its associated problems, and which has the **knowledge, skills, attitudes, motivations and commitment** to work **individually and collectively** toward solutions of **current problems** and the **prevention** of new ones.  
(p.3)

In addition to a list of others:

Evaluation ability: to help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, aesthetic and educational factors.  
(p. 3)

Environmental education (EE) is regarded as a permanent process in which individuals and the community gain awareness of their environment and acquire the knowledge, values, skills, experiences and also the determination which will enable them to act - individually and collectively - to solve present and future environmental problems.  
(p. 6)

Programme areas described in the present chapter are:  
(a) **Reorienting education towards sustainable development**; Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.  
(p. 1)

The goals of EE cannot be defined without taking account of the economic, social and ecological realities of each society, or of the objectives it has set for its development. However, one can point to certain objectives of EE that are common to the entire international community.  
(p. 6)

The objective is to promote broad public awareness as an essential part of a global education effort to strengthen attitudes, values and actions which are **compatible with** sustainable development. It is important to stress the principle of devolving authority, accountability and resources to the most appropriate level with preference given to local responsibility and control over awareness-building activities.  
(p. 4)

“environmental education follows the guiding line which, in most countries, is governing the movement of educational systems towards greater relevance, greater realism and better two-way contact with the physical and social environment in order to make people more closely involved in their surroundings”.

(p. 8)

It also falls to EE to define values and motivations conducive to behaviour patterns and measures that are instrumental in reserving and improving the environment. Behaviour patterns will never really be able to change as long as most members of a given society have not freely and consciously internalized more positive values vis-a-vis the environment, values capable of underpinning self-discipline. To this end, EE seeks to clarify and harmonize the ethical, aesthetic and economic concerns and values of individuals and communities, in so far as these influence their perception of the environment.

(p. 6)

The following objectives are proposed:

- (a) To establish or strengthen vocational training programmes that meet the needs of environment and development with ensured access to training opportunities, regardless of social status, age, gender, race or religion;
- (b) To promote a flexible and adaptable workforce of various ages equipped to meet growing environment and development problems and changes arising from the transition to a sustainable society;
- (c) To strengthen national capacities, particularly in scientific education and training, to enable Governments, employers and workers to meet their environmental and development objectives and to facilitate the transfer and assimilation of new environmentally sound, socially acceptable and appropriate technology and knowhow;
- (d) To ensure that environmental and human ecological considerations are integrated at all managerial levels and in all functional management areas, such as marketing, production and finance.

(p. 5)

The ultimate aim of environmental education is to enable people to understand the complexities of the environment and the need for nations to adapt their activities and pursue their development in ways which are harmonious with the environment... Environmental education must also help create an awareness of the economic, political and ecological interdependence of the modern world so as to enhance a spirit of responsibility and solidarity among nations....

Environmental education must adopt a holistic perspective which examines the ecological, social, cultural and other aspects of particular problems. It is therefore inherently interdisciplinary....

Familiar to the learners in their own home, community, and nation and it should help the learners acquire the knowledge, values and skills necessary to help solve these problems....

Environmental education involves learning from the environment as well as about the environment, and in many situations this would require changes to be made in some well-established approaches to teaching, especially in formal education. With the adoption of this problem-oriented and action-oriented approach...

(p. 12)

EE is more than just a particular aspect of the educational process; it should be regarded as an excellent basis on which to develop a new way of living in harmony with the environment, a new lifestyle.

(p. 6)

Education utilizing the findings of science and technology should play a leading role in creating an awareness and a better understanding of environmental problems. It must foster positive patterns of conduct towards the environment and the nations' use of their resources. (p. 24)

With this end in view, it is necessary to conduct research and experiments on ways of dealing, in the educational context and in the light of the different target populations, with questions relating to the shaping of attitudes and values in respect of the environment and associated problems. (p. 9-10)

A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of the environment.

A further basic aim of environmental education is clearly to show the economic, political and ecological interdependence of the modern world, in which decisions and actions by the different countries can have international repercussions. Environment should, in this regard, help to develop a sense of responsibility and solidarity among countries and regions as the foundation for a new international order which will guarantee the conservation and improvement of the environment.

(p. 25)

Noting that the concept of "the environment" includes a complex of natural, built and social components -life of humanity and that the social components constitute a set of cultural, moral, personal values and interrelations of people in the spheres of labour and leisure activities...  
Moscow Congress agreed that environmental education should simultaneously attempt to create awareness, transmit information, teach knowledge, develop habits and skills, promote values, provide criteria and standards and present guidelines for problem-solving and decision making.  
(p. 10)

The goals of environmental education are:  
(a) to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;  
(b) to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;  
(c) to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.  
(p. 25)

It therefore aims at both cognitive and affective behaviour modification. The latter necessitates both classroom and field activities thus an action-oriented, projected centred and participatory process leading to self-confidence, positive attitudes and personal commitment to environmental protection.  
(p. 10)

environmental education should aim at creating awareness, behavioural attitudes and values directed towards preserving the biosphere, improving the quality of life everywhere as well as safeguarding ethical values and the cultural and natural heritage, including, holy places, historical landmarks, works of art, monuments and sites, human and natural environment, including fauna and flora and human settlements. (p. 30)

The reinforcement of environmental education in technical and vocational education should be a major priority for improving the quality of the environment in the context of sustainable development. It should be noted that technical and vocational education should ideally relate human to technical activity and environmental protection as compatible within sustainable development. (p. 14)

There still remain substantial needs when one considers that the objective should be the creation of a genuine mass culture in respect of the environment, that is to say, a culture that is shared by all sectors of the population and by the majority of countries. p. (15)

### ***Approach to EE***

This new environmental education must be broad based and strongly related to the basic principles outlined in the United Nations Declaration on the New International Economic Order. (p. 2)

...it was not enough to make environmental education simply an adjunct to the normal curriculum. Environmental concerns must be an ever-present dimension and function of education in the broadest sense of the term, in all its forms and at all levels. (p. 7)

Since the Tbilisi Conference, the environment has been seen as a whole, simultaneously comprising natural aspects and those that result from human action; EE is viewed as a dimension of the subject matter and practice of education directed towards the solution of practical environmental problems through an interdisciplinary approach and the active and responsible involvement of each individual and of the community (p. 2)

While basic education provides the underpinning for any environmental and development education, the latter needs to be incorporated as an essential part of learning. Both formal education and non-formal education are indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. (p. 1)

Adopted unanimously at the close of the 10-day workshop at Belgrade was a statement, subject to modification by subsequent regional meetings, of the framework and guiding principles for global environmental education, which became known as the Belgrade Charter. (p. 1)

The development of environmental education constituted an ideal field of action for regional and international co-operation, since the unity of purpose of all peoples and of all governments was necessary in order to forestall and solve environmental problems. (p. 7)

However, owing to the magnitude of the conceptual, educational and institutional changes necessitated by the universalization of a new 'environmental culture', and in view of the problems newly created by human action on the environment, the efforts already made must be continued and intensified through the adoption of such measures as will enhance their effectiveness and their relevance. (p. 4)

Adopted unanimously at the close of the 10-day workshop at Belgrade was a statement, subject to modification by subsequent regional meetings, of the framework and guiding principles for global environmental education, which became known as the Belgrade Charter. (p. 1)

Advocate a holistic approach to the study of environmental problems which require the contribution of all natural, social and human sciences and the arts for their analysis and solution. (p. 12)

Another of its fundamental characteristics, namely, the interdisciplinary approach it adopts to take account of the complexity of environmental problems and of the multiplicity of the factors accounting for them. (p. 6)

Governments should strive to update or prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within the next three years. This should be done in cooperation with all sectors of society. (p. 2)

It should be centred on practical problems and be of an interdisciplinary character. It should aim at building up a sense of values, contribute to public well-being and concern itself with the survival of the human species. (p. 19)

In recent years there has been a gradual awareness, both worldwide and within each individual State, of the role to be played by education in understanding, preventing and solving environmental problems. We know now that the key to these problems to a large extent lies in social, economic and cultural factors, which are at the root of these problems, and that we cannot therefore prevent or solve them by purely technological means; we know that we shall have to act primarily on the values, attitudes and behaviour of individuals and groups in respect of their environment. (p. 5)

(a) a multidisciplinary approach incorporating environmental problems into individual disciplines; and (b) an integrated or interdisciplinary approach incorporating the environmental dimension in special disciplines, including man-nature interactions, taught by multidisciplinary teams. (p. 9)

Its subject-matter should permeate every part of formal and non-formal programmes and constitute one and the same continuous, organic process in which none of the phases essential to integration must ever be overlooked. (p. 19)

Schools should involve school children in local and regional studies on environmental health, including safe drinking-water, sanitation and food and ecosystems, and in relevant activities, linking these studies with services and research in national parks, wildlife reserves, ecological heritage sites etc.; Countries should strengthen existing advisory bodies or establish new ones for public environment and development information, (p. 4)

Environmental education should not give rise to "competition" with the various subjects at present on the curriculum. (p. 20)

The basic training of all environmental specialists will need to include study of the principles of environmental education, sociology and ecology which are necessary to enable the learners to foresee the consequences of their environmental work and not simply make do with temporary expedients... The variety of aims, institutions, traditions and manners of perceiving problems, combined with the frequent vagueness of the terminology used, is such that no attempt should be made, even where it is feasible, to cast environmental education for specialists in a series of universally valid moulds. What is needed, on the contrary, is to fit training programmes to the particular socio-economic situation in each of the regions or each of the countries with which the specialists will be concerned.

(p.20)

---

By adopting a holistic approach, rooted in a broad interdisciplinary base, it recreates an overall perspective which acknowledges the fact that natural environment and man-made environment are profoundly interdependent.

Environmental education must look outward to the community. It should involve the individual in an active problem-solving process within the context of specific realities, and it should encourage initiative, a sense of responsibility and commitment to build a better tomorrow. By its very nature, environmental education can make a powerful contribution to the renovation of the educational process. (p.24)

---

Considering it beyond doubt that the dissemination of specialized and general knowledge on the environment and the development of public awareness of the need for a correct approach to the complex problems of the environment are of tremendous and possibly crucial importance, both for further economic development and rational use of the earth's resources for the good of individual nations and of humanity as a whole. (p.37)

---

Convinced of the fact that formulation of curricula and reorientation of educational systems are not sufficient, but that there must be an appeal to the feelings of individuals and to their ethical and cultural awareness so as to lead them to protect, improve and enrich their natural environment on an enduring basis.  
(p. 49)

### ***Concept of Development and Sustainability***

[A new concept of development] is one which takes into account the satisfaction of the needs and wants of every citizen of the earth, of the pluralism of societies and of the balance and harmony between humanity and the environment.  
(p. 1)

...the preservation and betterment of the environment coincide with development to a large extent. Both are related and inseparable expressions of the capacity of man to improve his life, as well as provide for the well-being of future generations. People should utilize the resources of the earth in such a way that they can be transmitted to generations yet to be born as a heritage which is not only preserved but enriched. This sense of responsibility to future generations is a vital part of the awareness of environmental problems and to a large extent it remains to be created.  
(p. 11)

Impoverishment and population growth are part of a single complex phenomenon that can only be halted by means of a process of rapid, sustained development compatible with the preservation of the productive potential of natural and anthropogenic ecosystems  
(p. 5)

Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.  
(p. 1)

...development will also require the maximum reduction in harmful effects on the environment, the utilization of waste materials for productive purposes, and the design of technologies which will enable such objectives to be achieved. (p.1)

The Declaration of the United Nations Conference on Human Environment organized in Stockholm in 1972 proclaimed: “to defend and improve the environment for present and future generations has become an imperative goal for mankind”. (p. 24)

The industrialized countries too are at grips with environmental problems fundamentally linked to their prevalent models of growth and that include, first and foremost, the exhaustion of certain natural resources and the various types of pollution. (p. 5)

To promote integration of environment and development concepts, including demography, in all educational programmes, in particular the analysis of the causes of major environment and development issues in a local context, drawing on the best available **scientific evidence** and other appropriate sources of knowledge, and giving special emphasis to the further training of decision makers at all levels. (p. 2)

Considering that the broader conception of development to which all people now subscribe includes the environment as one of its basic components. (p. 27)

Environmental education should relate both the protection of nature in rural areas and the protection of human life and environment in cities. Prototype curricula should encompass flexibility, the fostering of a love of nature and sense of responsibility towards it, and focusing on behaviour modification and attitude development as more important than acquiring information.

Governments are encouraged to consult with people in isolated situations, whether geographically, culturally or socially, to ascertain their needs for training to enable them to contribute more fully to developing sustainable work practices and lifestyles. (p. 6)

Environmental education should be linked to sustainable development as indicated in the World Conservation Strategy. (p. 11)

Considering the need to increase the role and improve the quality of environmental education as a factor in national economic and social development. (p. 39)

The reinforcement of environmental education in technical and vocational education should be a major priority for improving the quality of the environment in the context of sustainable development. It should be noted that technical and vocational education should ideally relate human to technical activity and environmental protection as compatible within sustainable development. (p. 14)

It is essential to provide environmental training for specialists in the various scientific and technological disciplines, in order to ensure more rational and hence more harmonious, interactions between social systems and the human environment, in the context of sustainable development. "Protection" of the environment means use of its resources in a sustainable manner, a guiding principle in the training and retraining of specialists. (p. 17-18)

Realizing that many disciplines which are not directly concerned with the environment may nonetheless have major impact on them sustainable development of natural resources, UNEP, UNESCO, other international agencies and nongovernmental agencies should continue to seek ways and means to incorporate appropriate environmental elements in all professional and technical training courses (e.g. courses for engineers, architects, chemists, planners, economists, lawyers and technicians).

---

(p. 18)

This makes it necessary for specialists to be given training that lays emphasis on the interactions between development and the environment and thus enables them to understand the impact of human activities on the environment and to contribute effectively to the implementation of development programmes capable of maintaining a dynamic environmental balance. **The object is to promote the concept of sustainable development able to meet present needs while preserving the quality and productive potential of the environment, and hence its capacity to meet the needs of future generations...**train a sufficient number of high level personnel to ensure sustainable development and economic growth. This will teach the learner that environmental problems and their solutions are not solely of a technical but largely of a human nature, involving social, cultural, ethical and economic values.  
(p. 18)

---

There is need to develop “environmental economics” to integrate the ecological and cultural basis of sustainable development into theories and instruments of economics, as well as to develop indicators and data on the quality of life and the environment, indicators on the ecological potential for sustainable development, and different strategies for the integrated management of resources. (p. 19)

---

### ***Role of the Individual***

...no nation should grow or develop at the expense of another nation and that the consumption of no individual should be increased at the expense of other individuals. (p. 1)

It therefore aims at both cognitive and affective behaviour modification. The latter necessitates both classroom and field activities thus an action-oriented, projected centred and participatory process leading to self-confidence, positive attitudes and personal commitment to environmental protection. (p. 10)

Before this changing of priorities can be achieved, millions of individuals will themselves need to adjust their own priorities and assume a personal and individualized global ethic – and reflect in all of their behaviour a commitment to the improvement of the quality of the environment and of life for the world’s people. (p. 2)

## ***Role of the Collective***

**The threats that humanity has created for itself and for the earth, which sustains it,** can be dispelled by the exercise of human reason and the commitment of human resolve. (p. 8)

It has also been noted that, many information programmes, while seeking to reach all types of audiences, have had little impact on large sections of the population – and sometimes on those very people whose day to day activity most affects the quality of the environment. Hence the necessity for improving communication skills of scientists vis-a-vis the public; role of women in community development and environmental education; use of local knowledge and traditional skills and values; and special environmental training and retraining programmes for the developing world. (p. 15)

These bodies would help mobilize and facilitate different population groups and communities to assess their own needs and to develop the necessary skills to create and implement their own environment and development initiatives. (p. 2)

The development of environmental education constituted an ideal field of action for regional and international co-operation, since the unity of purpose of all peoples and of all governments was necessary in order to forestall and solve environmental problems. (p. 7)

Countries and the United Nations system should increase their interaction with and include, as appropriate, indigenous people in the management, planning and development of their local environment, and should promote dissemination of traditional and socially learned knowledge through means based on local customs, especially in rural areas, integrating these efforts with the electronic media, whenever appropriate. (p. 5)

A new joint pattern of work must be drawn up, involving home, community and school, to introduce young people to environmental issues. (p. 20)

### ***Concept of Global/Environmental Ethics and/or Values***

[A new global ethic] is an ethic which espouses attitudes and behaviour for individuals and societies which are consonant with humanity's place within the biosphere; which recognizes and sensitively responds to the complex and ever-changing relationships between humanity and nature and between people. (p. 1)

...contribute thereby to the search for a new ethic based on respect for nature, for people and for their dignity, and for the future, and on the need for a quality of life to which all will have access and in which all will feel themselves involved. (p. 28)

However, owing to the magnitude of the conceptual, educational and institutional changes necessitated by the universalization of a new 'environmental culture', and in view of the problems newly created by human action on the environment, the efforts already made must be continued and intensified through the adoption of such measures as will enhance their effectiveness and their relevance. Such is the main objective of the remainder of this document, which sets forth an international strategy for action in the field of environmental education and training for the 1990s (p. 4)

Governments should affirm the rights of indigenous peoples, by legislation if necessary, to use their experience and understanding of sustainable development to play a part in education and training. (p. 3)

[new global ideal] – changes which will be directed towards an equitable distribution of the world's resources and more fairly satisfy the needs of all peoples.  
(p. 1)

It also falls to EE to define values and motivations conducive to behaviour patterns and measures that are instrumental in reserving and improving the environment. Behaviour patterns will never really be able to change as long as most members of a given society have not freely and consciously internalized more positive values vis-a-vis the environment, values capable of underpinning self-discipline. To this end, EE seeks to clarify and harmonize the ethical, aesthetic and economic concerns and values of individuals and communities, in so far as these influence their perception of the environment.  
(p. 6)

With this end in view, it is necessary to conduct research and experiments on ways of dealing, in the educational context and in the light of the different target populations, with questions relating to the shaping of attitudes and values in respect of the environment and associated problems.  
(p. 9-10)

It therefore aims at both cognitive and affective behaviour modification. The latter necessitates both classroom and field activities thus an action-oriented, projected centred and participatory process leading to self-confidence, positive attitudes and personal commitment to environmental protection.  
(p. 10)