

bradscholars

Educating on the edge of chaos. Using complexity theory to examine pedagogical responses to global complexity by peace educators.

Item Type	Thesis
Authors	Romano, Arthur
Rights	<p>
The University of Bradford theses are licenced under a Creative Commons Licence.</p>
Download date	2025-04-21 01:17:36
Link to Item	http://hdl.handle.net/10454/5725



University of Bradford eThesis

This thesis is hosted in [Bradford Scholars](#) – The University of Bradford Open Access repository. Visit the repository for full metadata or to contact the repository team



© University of Bradford. This work is licenced for reuse under a [Creative Commons Licence](#).

EDUCATING ON THE EDGE OF CHAOS:

**Using complexity theory to examine pedagogical
responses to global complexity by Peace educators**

Arthur ROMANO

Submitted for the Degree of
Doctor of Philosophy

Department of Peace Studies

University of Bradford

2012

Abstract

This dissertation examines the nexus of complexity theory and peace education and its implications for developing educational praxis that engages with the demands of global complexity. In this thesis, I argue that as societies become more globalized and complex (global complexity) there is an onus upon education to adapt its methods so people can understand the workings of these processes better and further develop the ethical and creative resources needed for responding to system dynamics effectively. My central thesis is that the most appropriate way to do this is to use methods that are congruent with the subject matter of global complexity—that is to align one's pedagogy with one's subject area. This dissertation therefore investigates the situated and contingent responses of peace educators working in the field to the challenges and opportunities that arise when attempting to adapt to local/global dynamics. It utilizes ethnography, narrative inquiry, and autoethnography and draws its data from interviews with over 50 educators in India, Japan, and the US. This research demonstrates that when engaging with global complexity, peace educators adapt both their ontological understanding and methodological orientation in ways congruent at times with the insights of complexity theory. While this understanding can be at odds with mass educational methodologies, this tension also is a touchstone for peace educator's creative formulation of novel praxis in response to the demands of global complexity. This dissertation thus examines some of the possibilities for learning within complex knowledge production systems and highlights the need for further research into the dynamics and processes at play within global educational 'networks.'

Key words: Complexity Theory, Peace Education, International Education, Global Complexity, Educational Sociology

Table of Contents

Abstract.....	2
Key words: Complexity Theory, Peace Education, International Education, Global Complexity, Educational Sociology	2
Chapter 1: Contemporary Challenges in Education and the Need for New Methodologies .	6
Introduction.....	6
Research Questions.....	10
Peace Education: In Search of Creative Responses to Global Complexity	11
Meeting the Challenge of Global Complexity	13
An Introduction to Complexity Theory	16
Complexity Terms	17
Causality: Learning from Butterflies and Tornadoes.....	24
Overview of Chapters	27
Chapter 2: Teaching on the Edge on Chaos: The Pedagogical Implications of Complexity Theory.....	36
Introduction.....	36
The Field of Complexity and Education.....	38
Toward Greater Pedagogical Complexity: Critiques of Contemporary Education	41
Contemporary Challenges: Why Complexity in Education?.....	49
Teaching on the edge of Chaos.....	55
Conclusion	61
Chapter 3: Peace Education: An Overview of the Field.....	67
Introduction.....	67
What is Peace Education?.....	69
Cycle of Socialization	72
A Short History of Peace Education.....	75
Historical Roots	75
The Influence of the Reformpädagogik and Progressive Education	77
Contemporary Influences.....	79
What Do Peace Educators Teach?.....	82
Developing Holistic Curricula	87
How Do Peace Educators Teach?.....	89
Dialogue.....	91
The Arts	93
Critical Pedagogy.....	97
Concluding Thoughts.....	100
Chapter 4: Examining Alternative Praxis through a Complexity Lens	106
Introduction.....	106
Montessori.....	107
Montessori on the Edge of Chaos.....	111
Rudolf Steiner and Waldorf Education.....	117
Steiner on the Edge of Chaos.....	121
Moving Toward More Holistic Curriculum.....	122
Conclusions- Moving Toward Complex Educative Environments	125
Chapter 5: Research Methodology.....	130

Introduction.....	130
Methodology that Engages with Ontological Complexity:	132
Layered Methods for Researching Educational Responses to Complexity: Narrative Inquiry, Ethnography and Autoethnography	137
Autoethnography as Method: One Peace Educator’s Story.....	142
Methodological Implications of Coproducing Knowledge from Within a Complexity View.....	146
Ethnography as Method	151
Logistical Challenges of Researching within Global Complexity.....	154
Interview Questions and Collecting Data	157
Analysis.....	159
Toward Conclusions	163
Chapter 6: Teaching for Peace-Approaches from the Field.....	166
Introduction.....	166
Teaching for Peace in the Field—Hiroshima.....	168
Peace Education Content in Hiroshima	177
Encounter-At the Intersection of the Global and Local	182
Teaching Peace in the United States.....	184
The Center for Ecoliteracy’s Rethinking School Lunch Program.....	185
Overview of CEL’s use of Complexity Theory as a Guide for Educational Design	189
Experiential Learning and Complexity-inspired Curriculum	193
Complexity-inspired Pedagogy.....	198
Working Toward Whole School Change.....	202
Moving from whole school change to district change and beyond	206
The Mosaic Project	211
Mosaic-An Experiential Approach to Peace Education.....	215
Engaging with Complexity-Mosaic on the Edge of Chaos.....	219
Mosaic’s In-School-Program: In Search of more Far-Reaching Change in Education	226
Toward Conclusions	235
Chapter 7: India and the Struggle for Epistemic Complexity.....	242
Introduction.....	242
Challenging Globalization	245
Development Education.....	248
Vidya Ashram: An Introduction	251
Brief Overview of the Vidya Ashram’s Programs.....	255
Pedagogy in the Struggle for Epistemic Complexity.....	260
Global Connectivity and Local Knowledge.....	269
Swaraj Vidyapeeth (People’s Free University).....	275
Introduction.....	275
Banwari Lal Sharma- Founder of Peoples Free University.....	278
Content—Demarcating the Terrain of Resistance	280
Sawaraj Vidyapeeth- A Complex Approach to Content and Pedagogy for Social Change?.....	286
Toward Conclusions	297

Chapter 8: Conclusion.....	305
Summary of Rationale	306
Research Questions.....	307
Summary of Key Findings	308
Explanation of Key Findings	308
Toward Complex and Adaptive Methodologies in Response to Complexity.....	312
Oppositional Approaches to alternative praxis.....	318
Engagement with Formal Schooling.....	320
Insights for Application	327
The Role of Teacher-A View from the Edge.....	327
Educating on the Edge	330
Limitations.....	333
Future Research.....	335
Bibliography	337

Chapter 1: Contemporary Challenges in Education and the Need for New Methodologies

Introduction

Many teachers, parents, and students contend that education is a far more complex undertaking than it once was and that a greater degree of resourcefulness is needed in our approaches to the field. Such calls for change are not unique to the times we live in, as education continually has been challenged to respond to the pressing issues of its day. For the past three centuries, compulsory state education has been understood to serve the vital function of fueling economic growth and reinforcing national identity.¹ From its inception, these early forms of state education in Europe were widely framed as a force for positive social change as education was understood to be a critical social institution for transforming the harsh material realities of the ‘dark ages’ and the oppressive political relationships of the feudal period.

Following the educational stagnation of the industrial revolution in England, (Moky, 2001), meeting the challenge of increasing literacy rates and training ‘good citizens’ became widely regarded as necessary for strengthening social stability and as a strategy for quelling widespread discontent arising from economic exploitation and social upheaval. During this same period, industrialization and colonialism led to large-scale gains in material wealth for nations throughout Europe. As a result, the educational models developed ‘at home’ (in Europe) during that period were highly touted by elites working abroad as critical components for ‘progress’ and ‘development’ in colonized societies around the world. Mass education as developed in Western Europe with its focus on simple, replicable approaches for educating large numbers of people

¹ Alexander Duncan Campbell Peterson (1973) makes the case that modern education initially was designed in part to train ‘good citizens’ and foster obedience in relation to the state.

was promoted increasingly as the one and only way to educate people globally and for bringing them into the benefits of the industrial society.

These educational methodologies associated with the industrial revolution often aimed to train children and adults to think in simple, linear-causal ways, which are not suited to understanding the complexity of contemporary societies. In this thesis, I argue that as societies become more globalized and complex (global complexity) there is an onus upon education to adapt its methods so people can understand the workings of these processes better and acquire the analytical, ethical and creative resources needed for understanding system dynamics. My central thesis is that the most appropriate way to do this is to use methods that are congruent with the subject matter of global complexity, put simply—that is to align one's pedagogy with one's subject area. While examples of such praxis are scarce in mainstream education, peace education traditionally has sought to understand these local-global dynamics and to align peaceful ends and means. Peace education therefore offers an ideal testing ground for understanding how one might utilize a complexity-inspired pedagogy to support people in engaging in more informed and compassionate ways in a global complex world. This thesis therefore examines the efforts of people who are seeking to understand global complexity by deploying pedagogies that are (to varying extents) congruent with their subject area and it seeks to deepen the existing research on the contingent possibilities of these pedagogical experiments as they play out 'on the ground.'

Peace education praxis is significant as we now are forced to come to grips with the fact that despite the widespread influence of modern education, basic issues of poverty and economic injustice, violence, (Hobsbawm, 1996) and environmental decline have often worsened. These challenges we face in the modern period serve as a stark reminder of this need for change. The distribution of basic resources has come woefully far from meeting human needs for more than

half the people living on this planet. For millions of people, the effects of violence not only take the form of direct physical attacks² but also are more complex, manifesting daily as hunger pains, malnutrition, and premature death (Galtung & Gewalt, 1993, p. 106). According to the United Nations Development Programme Human Development Report, ours is a world of extremes. The poorest 40% of the world population—the 2.5 billion people who live on less than \$2 a day—account for 5% of global income, while the richest 10% account for 54%.³ Yet ironically, never before has the goal of abolishing poverty been more within our reach, as no longer are there insurmountable technical, resource, or logistical obstacles to achieving it. However, persist inequality still prevails as there are more than 800 million people suffer from hunger and malnutrition, 1.1 billion people do not have access to clean drinking water and, every hour, 1,200 children die from preventable diseases.⁴

Many people are challenged by this contemporary dilemma, as increased technology, modern education and the promises of democracy and capitalism have not transformed some of the problems affecting humanity most deeply and in many instances have even made them worse. The gap between rich and poor continues to grow on a global scale and the effect of several hundred years of industrialization is simultaneously taking its toll on the ecological systems of the planet. According to the Intergovernmental Panel on Climate Change (IPCC), the vast majority of scientists agree global warming is real and that “an increasing body of observations gives a collective picture of a warming world” that is the result of our activities and not a natural occurrence. (Climate Change, 2001, p.2). As a result glaciers are melting, plants and animals are rapidly losing their habitat, and severe storms and droughts are increasing. (p.2)

² For a more comprehensive definition of violence, see Johan Galtung’s work on structural and cultural violence. [Galtung, J. & Gewalt; K. (1993). *in: Der Bürger im Staat* 43(2).]

³ <http://hdr.undp.org/en/>

⁴ Annual report for 2006 <http://hdr.undp.org/en/>

There also has been a notable shift in the rhetoric of politicians in both the UK and the US in relation to global warming as many echo the need for serious changes in human behavior on a global scale. Not surprisingly, increasing numbers of educators are focusing on ecological issues as large scale changes are taking place in their communities around the world.

These social and ecological problems are complicated further as people look for sources of meaning from which to draw conclusions and instead find themselves amid a shifting view of the world as many of the other grand narratives of modernity that have anchored people over the past century are being undermined. Notably, there is an increased perception that government is out of touch and will not be able to ‘save the day’ as it instead is seen as unresponsive in light of concerns about accountability, corruption, and corporate influence. Further, science and progress are undermined consistently by unpredictable outcomes arising from human actions and interventions within complex systems. Yet even amid such paradigmatic uncertainty many educators around the world increasingly feel compelled to respond in creative ways to social and environmental problems affecting their lives and the lives of others.

Thomas Malone of MIT highlights the need for new ways of working and learning together to address the scope of these problems we are facing:

To solve the climate problem, we need a huge range of expertise. We have to know things about the physics of the upper atmosphere and the chemistry of the oceans and the economics of carbon taxes and the psychology of consumers who are making decisions about when to drive versus take public transportation. Collective intelligence mechanisms are ideal for bringing together those diverse kinds of knowledge. (Malone, 2009)

In seeking to respond to these contemporary challenges, many educators (Adams, 1997; Davies 2004; Doll 2005; Reardon, 1993) around the world point toward a need for a radical shift in educational thinking about how we understand the world. I am suggesting in this thesis that the search for methodological frameworks that can support these creative educational responses to

global complexity is a vital area of research in the field of education. In taking up this challenge, I examine the ontological and epistemological insights of complexity theory and explore its applicability in the field of education by employing those theoretical insights and sensitizing concepts in examining the field of peace education. Peace education is significant in light of this research project as it offers a diverse international body of work that explicitly responds to the demands of educating within a globally complex world.

This thesis makes a novel contribution to the field by examining the nexus of complexity theory and peace education and its implications for developing educational praxis that is responsive to the demands of ‘global complexity’ (Urry, 2003) . It supports efforts to address pressing social and environmental issues in the field by focusing on the link between theory and practice and it examines how peace educators respond to creative opportunities for educating within a globally complex and dynamic world. Complexity theory (Byrne, 1998; Capra, 2002; Lewin, 1992; Urry 2005) then provides a valuable analytical and metaphorical resource for evaluating the field of possibilities methodological change in response to global complexity and for building on exemplary efforts already underway in the field of education.

Research Questions

This thesis advances the argument that a profound shift in education, which seeks to embrace complexity, would need to employ a different epistemological lens that includes specialized analytical and metaphorical tools for making sense of dynamic processes and continuous change. These analytical and creative resources are largely lacking within mainstream educational discourse today.

In searching for these applied philosophical insights, this work explores examples of international educators—with a focus on peace and justice—that have developed pedagogical practices that seem epistemologically congruent with insights of complexity theory; and whose

practices attempt to engage the inter-disciplinary challenge of teaching about global complexity. This dissertation explores varied examples of praxis draw from the work of peace educators in India, Japan, and the US. Within these contexts, this research explores the following questions:

- In the field of peace education, what are the ontological frameworks that inform peace educational praxis and which of these are consistent with complexity theory?
- In their engagement with global complexity, are peace education pedagogies congruent with the insights of complexity theory?
- What do these applied methodologies reveal about the challenges and opportunities of developing alternative educational praxis that can be responsive to global complexity?

This work brings the challenges and opportunities of peace educators (who are attempting to engage with complexity) to the foreground and explores the possibilities for innovative responses to these demands by drawing on complexity theory as an analytical tool for examining emergent forms of praxis. This is significant as the utility of complexity theory as a descriptive explanatory lens has grown across disciplines in both the natural and social sciences but thus far has rarely been applied to the field of peace education and never been employed to examine peace educator's efforts to engage with global complexity. The remainder of the chapter will offer a brief overview of the scope and significance of peace education's response to complexity and of the utility of complexity theory in examining complex phenomena.

Peace Education: In Search of Creative Responses to Global Complexity

Peace education over the past fifty years has amassed an eclectic body of work in response to the complexities of both local and global challenges. These challenges continue to spur growing numbers of peace educators to seek alternative visions of education on a deep and systemic level as they are challenged to come to grips with such complex, fluid, and interrelated

problems. As a result, these educators are continually developing new theoretical frames and analytical resources in light of these increasingly complex concerns. The saliency of these challenges has been highlighted within recent peace research where there is now a “growth in understanding of the relational processes impacting on conflicts, poverty and wealth, human exploitation, destruction of ecosystems, weapons proliferation, terrorism, and so on” (Synott, 2005, p. 7).

Peace Education in its modern forms emerged in the last century as an attempt to deal with humanity’s most pressing problems. Sitting Bull, a Native American chief, was well known for his saying, “now we put our minds together to see what kind of world we can create for the seventh generation yet unborn” (www.lapismagazine.org). This sentiment encapsulates a core element of the ethics of peace education, which seeks to engender a deep sense of interconnectivity and mutual destiny. Peace education strives to empower future generations through “the capacity and inclination to make peace, to bring about a nonviolent and just social order on this planet” with the understanding that the manifestation of these changes “would be the primary indicator of a maturing of our species” (Reardon, 1993, p. 56).

Peace education has amassed a global and interdisciplinary body of work to solve the problems of direct and indirect violence. From a more holistic view, peace education must also include “the physical, emotional, intellectual, and social growth” from within a perspective that “teaches love, compassion, trust, fairness, cooperation, and reverence for the human family and all life.”⁵ To accomplish this, peace education typically emphasizes a complex pedagogical approach that includes creative and reflective processes, critical analysis, and dialogue as methods for building greater awareness of both self and world. It strives then to cultivate these

⁵ What is Peace Education? Web resource National Council for Teacher Education-What is Peace Education? New Delhi <http://www.ncte-in.org/pub/unesco/ch1.htm>

values and practices in hopes that they will support people in envisioning and implementing alternative futures and building peaceful communities and international systems within a complex world (Burns & Aspeslagh, 1996; Davies, 2003; Heywood, 1996; Reardon, 2001).

The best approaches to occasion this shift are highly debated and contentious points within peace education, which is exemplified by heterogeneity. Over the past five decades, peace educators have developed a prolific body of work, which seeks to support learners in engaging with a world understood in dynamic, adaptive, and interconnected terms. While some progress has been made in the search for a comprehensive approach to engaging with issues that are both local and global in scope, such far-reaching demands pose inherent problems that continually require more dynamic and methodologically complex approaches from peace educators. These demands place an emphasis within peace education on constant development in terms of the relationship between theory and practice, and sensitivity to complexity that is reinforced by the highly varied and dynamic contexts in which peace education takes place. Peace education therefore provides a rich body of work for analysis in terms of education that is on the edge of chaos as it presents a diverse array of strategies and approaches from which to consider pathways for engaging with global complexity and supporting learners in meeting the problems they may face with a greater sense of energy and resourcefulness.

Meeting the Challenge of Global Complexity

A case is made throughout this work that increasing global complexity (GC) poses a serious challenge to current educational endeavors. GC is defined in this work in dynamic terms and builds on sociologist John Urry's work employing complexity theory in relation to global processes. Urry argued in his book *Global Complexity* (2003) that globalization and other such conceptualizations of the global are commonly understood in static terms because of overly simplistic analytical tools. According to Urry, global complexity should be conceived of as a

profoundly relational and dynamic concept and as such requires new ways of thinking in the social sciences more in keeping with the insights of complexity. He draws on complexity theory in conceiving of GC as a complex convergence of adapting and co-evolving global systems, processes, and sets of relationships. These relationships are characterized by unpredictability, irreversibility and co-evolution (Urry, 2003). He proposes that such systems lack finalized 'equilibrium' or 'order' and thus is continually in flux.

From within this view, global complexity does not "exhibit and sustain unchanging structural stability," (Urry 2003, p.22) and is far more dynamic and vulnerable than static conceptions of globalization. Therefore, terms such as 'local' and 'global' are misleading as it is not possible to separate fully these inextricably linked frames of reference. Urry's conceptualization serves to highlight the value of the analytical and metaphorical contributions of complexity theory and sheds light on the analytical challenges faced by contemporary educators in their search for new conceptual resources for engaging with global complexity.

These ontological demands of grasping global complexity highlight the need for theoretical support in creatively navigating such dynamic and interconnected contexts. Complexity theory draws from the work of scholars from the natural sciences, cognitive psychology, philosophy, sociology and an array of other fields, all of whom argue that interdependent networks and complex adaptive systems cannot be understood adequately by reductionist approaches alone. Complexity researchers (Adams, 1997; Capra, 2003; Chesters & Welsh, 2005; Lewin, 2001) suggest that reductionist methodologies have led to a wealth of knowledge about individual parts and processes within systems, yet they have been largely unable to render complex system dynamics intelligible.

This point alone is a serious challenge to the epistemic ascendancy of positivists and

reductionist tendencies in the West, and the corresponding social, and educational forms they have originated. This inability at times to grasp change in systems, to understand the importance of a relational and process-oriented perspective and to recognize emergent properties, is a greatly limiting factor in the frameworks guiding contemporary education and research, which complexity theory is well positioned to address. There is currently an upsurge of work in the natural and social sciences—and, indeed, within the humanities—under the rubric of ‘complexity theory’ (Byrne, 1998; Capra, 2003; Chesters, 2005; Cilliers, 1998; Urry, 2005b). This research has increasingly emphasized the importance of a ‘systems approach’ in understanding material, organic, and social phenomena occurring through non-linear, adaptive, and dynamic processes (Fraser et. al, 2005; Jones, 2004; Maasen & Weingart, 2000). Referred to by many as the ‘complexity turn’ (Urry, 2005b), developments across a diverse array of fields within the natural and social sciences has produced a broad spectrum of new concepts, models and simulations for understanding these system effects.

Complexity science “represents the cutting edge of interdisciplinary research and knowledge exchange” according to the Gulbenkian Commission on the Restructuring of the Social Sciences, which was convened in 1994 and brought together thinkers from around the world to critically examine inadequacies in the social sciences (Wallenstein, 1996). The commission, chaired by world systems sociologist Immanuel Wallerstein and the Nobel prize-winning scientist Ilya Prigogine, recommended the urgent removal of barriers between the ‘natural’ and ‘social’ sciences, moving beyond interdisciplinarity toward a ‘post-disciplinary’ era. While the committee’s work was criticized as biased and utopic by some,⁶ it also highlighted

⁶ Buroway rightly cautioned, “We hear nothing about how and where this new knowledge will be produced. Nor do we hear for whom this knowledge will be produced, nor for what ends. Instead we have an abstract and totalizing utopia that reflects the concerns of Western academics, perched high up in the ivory tower, seemingly unaware that

the growing reach and scope of complexity thinking in academic circles at that time and the possibilities of this fledging body of theory for knowledge production.

The complexity turn then offers a novel area for research in education as it has generated a rich array of metaphorical and analytical tools, which to date have been explored rarely in the field of education and are largely missing from the peace education literature. While the field of complexity theory is still under-developed, it offers a growing body of work for understanding complex, interconnected, and adaptive systems. This is significant for education, which endeavors to engage with pressing global issues. Doctor Martin Luther King Jr., in a speech in 1968, poetically highlighted the importance of this epistemic realization and the need for social justice work when he exclaimed, “we are tied together in the single garment of destiny, caught in an inescapable network of mutuality. And whatever affects one directly affects all indirectly” (King, 1963). Complexity offers a growing body of resources for grappling with those effects, which as of now have been utilized infrequently in education.

An Introduction to Complexity Theory

In the most general sense, a complexity theory approach stresses the importance of a more robust understanding of the dynamics of systemic relationships and the need for analytical resources that resist fragmentation or overly static conceptions of the real. Graeme Chesters argued that insights emerging from within complexity theory have emphasized “the contingent quality and vulnerability of systems that might otherwise appear robust,” (Chesters, 2005, p. 127) warranting a significant reassessment of our understanding of social change and the previously dominant models of how and when that change might be achieved (Chesters, p. 127).

the fortress beneath them – supporting them – was under siege” “Open the Social Sciences: To Whom and For What?” by Michael Buroway (address delivered to Portuguese Sociological Association, March 30, 2006 http://en.wikipedia.org/wiki/Gulbenkian_commission

These findings are significant for anyone interested in systemic change in education, as many of the systems that effect educational processes may in fact be more vulnerable than often are conceded. Complexity theory has thus developed a wide array of metaphorical and analytical resources for understanding dynamic systems and the complex processes that animate emergent change.

Complexity Terms

The language of complexity offers educators new ways of thinking about the possibilities within the complex and deeply interrelated systems in which we are currently living and working and challenges many of the assumption embedded within current educational thought. Several major concepts are considered here that can support educators in investigating the ways in which the systems of which we are a part are learning (or not) and the extent to which they may be susceptible to change. These core complexity concepts include complex adaptive systems, nestedness, emergence, state space, strange attractors, the edge of chaos and self-organization. While the importance of interconnectivity and unpredictable change largely have been marginalized or ignored within mainstream educational theory, the framework of complexity brings these dynamics to the foreground. In challenging fragmentation, it allows for a deeper examination of the implications of nonlinear causality on educational processes and makes way for a radical reinterpretation of educational possibility.

Complexity theory focuses largely on the processes and workings of complex adaptive systems (CAS). CASs can vary greatly in size and form and range from cells, to ant colonies and weather systems. They are self-organizing systems that operate in a state that is far from equilibrium. They are dynamic in the sense that they respond to their environment and change over time. The patterns of relationship constituting such CASs, may take many forms and yet they tend to avoid highly centralized structures. A CAS is a system acting and reacting as a

whole to constant change, often adapting through a complex variety of feedback mechanisms to the variability of the contexts in which they find themselves.

Chesters noted “a complex system is normally comprised of a large number of elements that interact with each other and with their environment” (Chesters, 2005, p. 126). Physicist and systems theorist Fritjof Capra supports this claim by arguing that in the biological world the defining characteristic of such systems is, “that it undergoes continual structural changes while preserving its web-like pattern of organization. The components of the network continually produce and transform one another” (Capra, 2002, p. 30).

The presence of such complex systems is ubiquitous and can be found in material as well as social systems. The implications of this sense of dynamic relationship and constant change pose an important set of questions for educators as many of the spaces in which we live and teach can also exhibit the attributes of CASs described by Chesters and Capra. Given this point, how then can education contribute to seeing the world in more dynamic and inter-related terms, a world in motion, which offers constantly changing, shifting, and emerging possibilities for learning? How might we teach in a way that draws out a wider array of opportunities for understanding and engaging within the many varying contexts of which we are a part and to which we are connected?

The complexity literature provides a host of conceptual resources for considering ways to answer these questions. While CAS's are an important unit for analysis within complexity theory, they are not considered in isolation from other kinds of systems or each other. From a complexity point of view, CASs are constantly interacting with and are located within other larger systems. This idea often is referred to as ‘nestedness,’ as systems are nested within and form parts of larger and often more complex systems (Capra, 2002; Chesters, 2005). Looking at

the natural world, this point is understood easily. For example, cells (which are tiny complex adaptive systems themselves), form clusters of cells (tissue) which makes up organs, which in turn function as a system. Those cellular systems are nested within an organism (e.g., a human being) which exists in relation to other organisms that form various communities that interact with and are part of their larger environments, all of which can constitute an ecosystem, which in turn rest within larger ecological webs, all of which are nested within the wider biosphere.⁷

As complexity scholars have worked to understand this profound sense of ‘inter-being’⁸ they have focused on examining the quality of interactions and the effects between these differing levels of order. Chesters summarized some of the most influential concepts from within the literature for examining patterns of influence and cause and effect within systems. He highlighted and briefly defined key concepts that will be drawn on and explored further throughout this work. These include: 1) emergence (the irreducible qualities of a system) (Johnson, 2001); 2) state space (the state of a system understood through multivariate analysis) (Byrne, 1998); 3) strange attractors (the capacity of an idea, behavior or action to perturbate the trajectory of a system between state spaces) (Byrne, 2009c); and 4) self-organization (the capacity for order to emerge spontaneously from chaos) (Capra, 2002).

As complexity theory approaches emphasize that systems are open and they are not in any real sense completely separate or closed, these concepts provide an opportunity for educators to rethink causality and the dynamics of context within education. For example, in considering the classroom, with its spatial confines, walls, door and windows, it is easy to think of it as a closed system, largely fixed and stable over time. However, in the simplest terms the classroom

⁷This basic representation of nested systems is far too simple as it forms just one axis for analysis focusing mostly on biological units of systemic analysis.

⁸ This term is often used by the Zen poet and Nobel laureate Nhan Hanh, T. (1998).

is open, as students and teachers come and go and bring new ideas, objects, and experiences with them, which inevitably affect the educational processes and material space itself and vice versa. Even while students are in their classrooms with the door closed, this environment is more porous than may readily be acknowledged. This is evident when students communicate with other students playing in the schoolyard, observe a bird on a wire outside the window, or secretly send text messages to people farther away.

A complexity theory perspective in education challenges educators to consider the limits of their vision and their role as facilitators of learning communities nested within larger systems. It lends itself to a reflexive view, which challenges educators to ask: How is the primary learning community I am embedded within related to other learning communities? Complexity provides an important reminder for educators continually to consider how to make relevant, not only that which is experienced within the classroom but outside its walls. Complexity researchers therefore frame their analysis of what is possible in terms of ‘systems within systems’ with a real need for tools that assist in shifting analysis between and across levels and scales or organization.

Much of what is being explored in this dissertation builds on that challenge of examining the opportunities that may be present within education when viewed through a lens that takes into account nestedness and dynamic interconnectivity. Because of this analytical orientation, educators are challenged to consider not only how their curriculum can engage with what is emerging within the classroom but also with other sources of energy and influence. The complexity educator might ask: how do I understand this learning community and its boundaries? To what degree does this class engage with sources of energy that lie ‘outside’ its physical boundaries? Where are there areas of permeability? Am I drawing on knowledge and opportunities within the larger community? For example, have I engaged parents, professionals,

artists and others? Do disenfranchised members of the community have something to offer? If so, what and how might that be integrated into our formal learning community? What effects are these actors already exerting on our learning community and how might we engage with them differently?

Complexity provides a frame of analysis for educators that emphasizes attentiveness to opportunities ‘outside’ traditional boundaries within education, as well as a keen focus on the internal dynamics that exist within educational systems. Capra suggests that educators can learn from living systems, which he describes as “self-generating networks organizationally closed within boundaries but open to continual flows of energy and matter” (Capra, 2002, p. 49). From within this view, relationships like those that exist in the classroom have some elements of stability over time but also must continually be open to change and to dynamic sources of energy if they are to remain alive and relevant.

In a biological system there is a kind of material intelligence that enables processes to take place and remain durable over time while also being open to change (even if sometimes quite suddenly). The most effective adaptive systems then are engaging in a constant balancing act both maintaining and adapting structure while engaging chaotic elements that are present within any given context. These systems must remain both resilient and mutable, existing on what is known as the ‘edge of chaos’ in complexity theory (Langton, 1990)

The edge of chaos is singled out from among the key sensitizing concepts highlighted in this thesis as it offers an important metaphorical resource and meta-conceptual tool for examining adaptive praxis. The edge challenges the language of control, repetition, prediction and evaluation popular in mass educational methodologies by cautioning that if systems are overly rigid they may not be able to adapt to changes in context and thus can become cut off

from the vital sources of energy necessary for survival and relevance over time.

This is not to say that a view from the edge calls for abandoning structure in education altogether. Rather, it recognizes that if such systems do not possess a substantial enough structure they can also break apart and be consumed by chaotic elements. The edge of chaos is useful as it draws analytical and creative attention toward examining the dynamics that are at play as educators and learners continually negotiate structure and change in light of the demands complexity.

Complexity theory maintains that these complex processes of adaptation often involve emergent outcomes, which cannot be understood fully through simple analysis of the interactions of the component parts within systems. Here Chesters succinctly summarized these findings in the field of complexity:

These systems are characterized by emergent properties that are irreducible to the sum of the systems parts. Properties that are evident at the systemic level but which are not implicit within the elements comprising the system or through the addition of those elements or the relations between them. (Chesters, 2005, p. 409).

In *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*, Steven Johnson demonstrates that emergence occurs from a multiplicity of interactions resulting from the internal logic and patterns of a system, its coupling with its external environment and the needs that arise from the creative interactions of these forces. (2001) For example, Johnson describes how local behavior leads to higher order intelligence in ant colonies:

Individual ants have no way of knowing how many foragers or nest-builders or trash collectors are on duty at any given time, but they keep track of how many members of each group they've stumbled across in their daily travels. Based on that information—both the pheromones signal itself, and its frequency over time—they can adjust their behavior accordingly... Given enough ants moving randomly through a finite space, the colony will be able to make an accurate estimate of the overall need for foragers or nest-builders. (Johnson, 2001, p. 77)

Self-regulation in these ant colonies is, in Johnson's view, an emergent phenomenon that

manifests from variable local behavior taking place throughout the collective of the colony. While the mechanisms through which emergence is achieved vary (Sawyer, 2005, p. 203) emergence can be understood as a macro systems effect resulting not from centrally coordinated action but rather from locally responsive actions and interactions.

Emergence occurs in many collective human environments as well and includes a wide array of sociological phenomena ranging from the establishment and functioning of community gardens and home school networks to neighborhood segregation. Johnson offers an example that illustrates the emergence of security within a city, which he argued is partly a result of the “local interactions of strangers sharing the public space of the sidewalks” (Johnson, 2001, p. 92). The large numbers of people and the tightly confined spaces of the sidewalk result in “plenty of eyes on the street” (Johnson, p. 92-93) and this high degree of collective participation makes possible self-organizing processes in response to changes in safety. That capacity, in this case, to prevent and respond to a crime or wrongdoing as it occurs, emerges because of having the requisite complexity to respond creatively to such changes.

This emergent view of responsiveness poses important challenges for educators especially those situated within educational institutions that rely solely on teacher-centered methodologies and strictly hierarchical decision making which may simply label emergent processes as a distraction or disruption and which measure solely for individual success (Doll 2005; Horn, 2008; Kennedy and Kennedy 2010; Radford, 2008). In terms of our inquiry into educational change, this begs the question: How do emergence and self-organizing processes play out in education? How can we as educators support emergent processes of learning? What would such a commitment mean for our pedagogical approach? What kinds of material spaces and processes are most conducive to supporting self-organizing processes?

To begin to answer questions like these, complexity suggests that an understanding of the processes supporting self-organization and emergence are needed. In terms of the basic mechanisms for change within systems, the presentation of complexity offered thus far has primarily highlighted adaptive systems and their interactions with their immediate environments. While a complexity analytic challenges educators to consider such localized complexity, it also acknowledges the importance of nestedness and therefore examines claims that localized change also can be affected by small shifts, which may originate far away from the places where they are most deeply felt. This elucidates one of complexity's most popular claims: that small changes in one system or place can have large-scale effects farther away. While this entire work will explore the epistemic implications of these claims more fully; this point is worth exploring here as it disrupts typical notions of causality, which underlie our ontological orientation.

Causality: Learning from Butterflies and Tornadoes

As has been emphasized throughout this section, the dynamics of interaction within global complexity are often multiple, complex and simultaneous. One of the effects of such simultaneous interconnectivity and openness is that pathways for influence, albeit subtle, extend far beyond a given locality or a single front. Therefore, complexity contends that change is often nonlinear and that open systems greatly add to the complexity of the world. This problematizes linear conceptions of causality undermining the hegemony of linear change and making prediction far more difficult.

The existence and potential effects of such nonlinear causality often are highlighted in the complexity literature with the concept of the butterfly effect. The butterfly effect illuminates the theoretical moment when a metaphorical butterfly flaps its wings on one side of the world setting off a series of small changes across multiples systems, which build and over time contribute to the manifestation of a tornado on the other side of the planet. According to Chesters, local

behavior can result in large changes when “repeated and magnified through processes of iteration and interaction” (Chesters, 2005, p. 126).

These changes are by no means limited to material systems, as these dynamics also have been observed in the realm of social change. Chesters noted the account given by Vaclav Havel in *The Power of the Powerless*, which elucidated concrete acts of resistance among the citizens of Czechoslovakia and how these small changes in the behavior gained momentum in unpredictable ways contributing eventually to the Velvet Revolution (Chesters, 2005). From within this view:

an important pre-condition for such a theoretical possibility is that a complex system, be it the weather or a political regime, is open and exists in conditions far from equilibrium thus providing for the possibility of actualizing certain immanent properties of the system and leading to unpredictable outcomes, albeit tornadoes and revolutions are rarely realized. (Chesters, 2005, p. 126)

As the learning potential of individuals and collectives are inextricably linked, complexity challenges us to investigate the systems of which we are a part are learning (or not) and the degree to which they may be open to change. James Lovelock, author of *Gaia*, accurately summarized the implications of a complexity theory in this domain:

Intelligence is a property of living systems and is concerned with the ability to answer questions correctly...especially questions about those responses to the environment, which effect the systems survival, and the survival of the association of systems to which it belongs. (Lovelock, 1979, p. 146)

Complexity education takes seriously questions about maximizing collective learning and resists reductionist tendencies to conceive of intelligence in purely individualistic terms. The metaphor of the butterfly effect pushes this complex interpretation of knowledge construction one step further inviting us to consider the ways that information and learning processes may travel across vast distances and impact unpredictable changes within interconnected systems as the result of small actions.

This kind of underlying analytical shift away from fragmentation, simplicity, and isolation in education alone would be nothing short of a revolution in our thinking. Complexity theory presents a significant interpretative lens for examining the possibilities for contemporary educational innovation especially when applied to the field of peace education, which seeks to be responsive to the complex opportunities and challenges that exist today.

In summary, I contend that interconnected social and ecological challenges have moved many educators to see education as an important pathway to explore their agency in relation to global complexity and the creation of more democratic, equitable, and sustainable world. The field of peace education offers a rich area for analysis when considering this search for new educational methods and approaches that respond to the opportunities and challenges of educating on the edge of chaos. This is not to say that peace education is without its challenges as it often struggles to respond to power and oppression within complex adaptive systems and to conceptualize global complexity within a world of dynamic interconnectivity where outcomes are both difficult to predict and surprising.

This thesis examines the nexus of peace education and complexity theory, as complexity offers a fresh interpretive device when considering fundamental sociological questions in the field of education vis-à-vis the relationship between structure, agency, creativity, and context. It provides a host of analytical and metaphorical resources that may be able to support practitioners in thinking creatively about what is possible within dynamic complexity. Furthermore, the field of complexity-inspired education can gain from the adaptive expertise emerging in the field of peace education in response to the complexities of everyday life and the far-reaching concerns of this global field. A complexity perspective begs a more integral approach from educators challenging us to question the role we are playing or can play in maximizing learning within the

various systems in which we are located, and the most effective ways that we can move from the global to the local and back again..

Admittedly, holistic, sustainable, and far-reaching changes within educational praxis rarely are realized, much like revolutions and tornadoes. However, this work seeks to advance the claim that understanding the praxis of peace educators from a complexity theory perspective can enrich the conceptual and analytical tools educators can draw on when seeking to re-imagine pedagogical and curricular possibilities.

Overview of Chapters

This dissertation is structured logically to develop the argument outlined above and each chapter explores the applicability of complexity theory and/or peace education in generating educational responses to global complexity. Chapter two investigates work taking place under the banner of complexity and education and examines the insights of researchers who are thinking through the implications of the discursive and conceptual language of complexity when applied to the field of education. The chapter offers an extended interdisciplinary literature review that highlights this growing area of educational research, which draws its theoretical inspiration in part from sources from within the natural sciences: mainly biology, ecology, and physics. Complexity's critique of modern educational practices is examined in detail in this chapter and by way of background is linked to the critical work of major educational thinkers who preceded the complexity sciences including Jean-Jacques Rousseau, Maria Montessori, Paulo Freire, and others.

This chapter develops a critical account of mass educational methodologies from the point of view of complexity theory and focuses on several key theoretical developments in the prelude to and during the Enlightenment period in Europe that led to the ascendancy of

reductionist approaches. This historical examination of the rise of mechanistic and reductionist approaches in the field includes an in-depth analysis of the creation of ‘modern’ education and state sponsored schooling and the emergence of the language of control and management that arose during this period and persists today within mainstream education. A case is made in this chapter that the approaches to education that became dominant during this period sought to minimize chaos, complexity and responsiveness to the specific contexts and knowledge of communities in favor of simple, consistent and predictable approaches that led to easily measurable outcomes.

Given this critique of the epistemological and ontological limitations of mainstream education, complexity authors (Capra, 2002; Davis & Phelps, 2004; Kentel & Karrow, 2007; Osberg, Doll & Trueit, 2009) contend that education is therefore struggling to meet the challenges of increasing global complexity precisely because it was never intended to and therefore lacks many of the analytical and generative tools to do so. (Doll et al., 2005) As this thesis seeks to understand and support educators in meeting the challenges of educational change in an age of explicit global complexity, the second chapter of this dissertation then is an examination of the alternative methodological orientation offered by complexity theory in the field of education.

This task requires elucidating the analytical framework of complexity and an examination of the epistemological and ontological orientation of complexity educators⁹ and researchers. Thus, this chapter examines a host of sensitizing concepts from complexity theory in terms of their descriptive explanatory value in the field of education. Fortunately, while the complexity

⁹ In this dissertation, I use the term complexity educators to refer to practitioners that are working to engage global complexity in their pedagogical and/or curricular endeavors. In some cases, educators explicitly state that engagement as their goal while others demonstrate it by continually adapting their praxis to meet the demands of global complexity in ways that were congruous with insights from complexity theory.

and education literature is relatively new, it offers a rich array of metaphorical and analytical resources for examining education that is responsive to global complexity. Chapter two emphasizes the edge of chaos as a significant sensitizing concept for educational research and practice arguing that it provides a useful lens through which to nuance educational opportunities in terms of the balance between set structures, existing processes and emerging opportunities.

This conversation about teaching on the edge of chaos supports an initial investigation of the methods, guiding principles, attitudes, and considerations that can support educators in engaging within emergent opportunities and adaptive approaches to teaching and learning. A discussion of the edge therefore begins to draw us toward a deeper exploration of the balancing act required when seeking to maintain somewhat durable educational processes and structures while also continually engaging with new sources of energy and inspiration in responding to global complexity. Educators on the edge are constantly asking, what is the minimum amount of structure that can maximize learning? How can learning be catalyzed by the complex interaction of where we are teaching, who the students are, and the possibilities emerging from the interaction of pedagogy, place, and curriculum? The edge is highlighted in chapter two as it can prefigure an educator's orientation with a wide range of pedagogical contexts and therefore can serve as an interpretive device for reflecting on opportunities for innovation. This sets the stage for a more in-depth analysis of the ways in which complexity-inspired analysis can be applied in light of how educators are responding to the demands of global complexity in the field.

Chapter three begins this work of searching for examples of educational praxis that may be consistent with a complexity approach in attempts to engage with global complexity. It offers the reader an overview and some contextual grounding within the field of peace education. This is no small task as peace education often is used as an umbrella term that includes a complex set

of shifting subfields and thematic areas of study, which are extensive, inter-related, and debatable as to their reach and scope. Chapter three begins with a brief historical overview of peace education and the values, vision and parameters of the field. This chapter features the growing constellation of subject areas, which make up this dynamic body of work. In seeking to address the question, 'What is peace education?,' it provides an overview of some of the most widely recognized areas of study, offering distinct and separate subject areas for consideration. While this does violence to the depths of interconnectivity and mutability that exist within and between these areas of inquiry, this organizational framework is presented to offer some basic thematic guideposts and general orientation within this expansive field.

After reviewing peace education content, chapter three examines the pedagogical implications of this amalgamated global field. Peace education pedagogy is complex and has drawn on a wide array of critical, creative, and experiential pedagogies in seeking to meet the demands of responding to complexity. Peace educators have thus developed layered pedagogy employing an array of methods that range from dialogical processes to the arts. While these pedagogical approaches are not relegated solely to the field of peace education, they do converge in a unique way within the field and yield insight into these educational attempts to engage creatively with global complexity. Thus, this chapter advances a central claim of the thesis, which is that peace education's explicit focus on engaging with complexity and its unique location as an emergent global body of practice with transnational networks of affinity and interest offers an important albeit limited view into what complexity-inspired praxis might look like.

Where chapter two and three began the work of locating this author's search for complexity-inspired methodologies within the broad canon of literature in both complexity and

education and peace education, Chapter four begins to apply complexity theory to these alternative approaches within the field. It narrows this conversation about the possibilities for educational change grounded in epistemological and ontological insights that are more complex by examining the work of two influential alternative educators, Maria Montessori and Rudolf Steiner. Both Montessori and Steiner are widely acknowledged as impactful figures by peace educators (Bajaj et al., 2008). Their work is significant in terms of rethinking education that is responsive to global complexity as they both attempted to create alternative epistemological/ontological systems that could respond to complexity and counteract the isolating effects of mass educational methodologies and their work has grown internationally over the past century. As such, this chapter offers an initial opportunity to examine the influence of alternatives to reductionist and mechanistic methods, illuminating substantial changes in thinking regarding rethinking pedagogy and content, the significance of the structure and location of educational spaces, how teacher development and leadership is conceptualized and nurtured, and the ways that school leadership engages in decision-making. Thus, this chapter draws out some of the key conceptual and interpretive axes around which applied approaches are examined later in this thesis.

Toward that end, this chapter is an examination of how these alternative methodologies can be seen from within an analytic that is informed by complexity theory and looks to enliven a discussion not previously had in the literature about possibilities for integration between complexity theory and these popular alternative methodological approaches. This discussion brings to the foreground important questions about viable pathways for engagement with complexity and the challenges and opportunities of such engagement. Responding to the critiques put forward in chapter two of tendencies within a modern educational paradigm to

replicate overly simplistic methodologies, chapter four assesses the relevance of the alternative pedagogical processes used by these alternative practitioners globally. In all, chapter four examines the ontological and epistemological commitments of Montessori and Steiner and the degree to which their praxis is consistent with a complexity-inspired approach. These alternative orientations and pedagogical and curricular processes begin to provide pragmatic insights into what a more complex applied methodological approach within education could look like and move this work one step closer to the goal of understanding how complexity-inspired approaches can be examined when they are implemented in the field.

The methodological and conceptual exploration offered in the first four chapters of this dissertation help deconstruct the hegemonic discourse of contemporary education and illuminate the limits of reductionist approaches to the field. In so doing, they create the analytical space needed to chart a new path toward deeper engagement with global complexity by elucidating alternative methodological frameworks and an expanded palate of potential pedagogical and curricular tools available to educators. This examination of the literature on peace education and complexity and education offers a significant albeit frozen snapshot of these dynamic ideas of praxis and as such are one step removed from the daily realities of teaching and learning. While this theoretical orientation process is helpful, this thesis endeavors to understand the dynamics of how these educational methodologies and the ontological and epistemological perspectives that underpin them are applied in light of the constantly changing demands of global complexity. As a result, it is necessary then to augment this research with the experiences of educators in the field.

To clarify the methodological approach used to examine this data in the field, chapter five is a proposal of a vision for a complexity-inspired research methodology applied to the field

of education. The methodological approach is participatory, ambitious, and complex in that it goes beyond a simple dialectic between the author and the literature in the field by including ethnographic data collection, narrative inquiry, and autoethnography. Chapter five is an explication of how the data was collected and analyzed and the rationale behind the sampling strategies and analysis. A case is made that the methods used for data collection offer a timely approach to educational research in that they seek to be responsive to the complexity of the times in which we live by bridging local, regional, and international networks of participation, incorporating the use of information technology, and emphasizing the importance of interdisciplinary research and transcontinental views. The result is an interdisciplinary conversation that emerges as peace educators in India, Japan, and the United States shared their experiences and those experiences were examined through the analytic and self-reflexive approaches highlighted above.

Chapter five also highlights the primary epistemological and ontological challenges that complexity theory poses in relation to both quantitative and qualitative approaches. It includes an examination of my position of privilege as a researcher and global peace educator and some of the demands of researching in international contexts all of which influenced the direction of this project and my approach in seeking to collect and describe data from a perspective in keeping with the ontological implications of complexity. Thus, in chapter five, I seek to examine both the methodological insights that informed my approach to methods and to make explicit the limitations of this work. As such, I am pointing toward an expanded field of possibility in terms of methodological approaches that are congruent with complexity and the need for more comprehensive research practices in the future.

Chapter six then begins this work of examining the dynamics of educational praxis in

response to global complexity in the field by highlighting the efforts of peace educators in Japan and the US. This chapter is an analysis of the pedagogical practices, curricular resources, and educational contexts that these educators used in seeking to engage creatively with global complexity. The data presented in this chapter offers a window into these educators' changing ontological orientations over time and the pragmatic constraints and opportunities they faced given the contexts in which they operated and the choices they made over time when dealing with complexity. Chapter six includes an identification of three major pathways through which these educators sought to engage with complexity, which included: diversifying their pedagogical strategies, generating interdisciplinary curricula and drawing on global connectivity to intensify pathways for communication, encounter, and feedback. This chapter reinforces the significance of embedded experience on the development of praxis as this research examines not only changes in pedagogical and curricular strategies that were in keeping with a complexity-inspired approach but on a corresponding shift in their orientation toward the field of possibilities in education over time.

While the diverse learning locales featured in chapter six presented varied examples of education on the edge of chaos, those responses to global complexity all took place within the relative similarity of highly industrialized countries that benefited from their privileged positions within the global political and economic order. In chapter seven, I widen the range of examples offered in the thesis by examining the efforts of educators in India. While these educators responded to complexity through similar pathways for engagement to those highlighted above, they conceptualized their relation to the global in profoundly different terms. Given their positionality within a rapidly globalizing country with a rich history spanning several thousand years and a colonial past, they explicitly focused on global flows of power and the role on

international organizations and institutions on influencing epistemic complexity. They thereby conceptualized the global as a space of resistance as well as opportunity and sought to engage with complexity in part by diversifying the epistemic and ontological parameters of education and by disrupting neoliberal conceptions of the global and of the purpose of education. Thus, they reframed education in light of the possibilities of ‘alternative’ globalization (Held & McGrew, 2007; Sadgopal, 2005) and local conceptions of education and development (Escobar, 2007; Sadgopal). As such, this chapter is a further illumination of the significance of the context in influencing responses and understanding of complexity.

The conclusion to this dissertation brings together the main components of this argument. It is a reiteration of the limitations of mass educational methodologies and the promise complexity theory provides as a descriptive explanatory lens in education. It highlights peace education as a global and emergent body of work that is responsive to global complexity. It applies complexity theory as an analytical framework for making sense of the epistemological and ontological orientations of peace educators working in the field and it fortifies the case that complexity theory can serve peace educators from diverse backgrounds and normative frameworks in developing creative pedagogical and curricular strategies for engaging with global complexity. This chapter concludes with some recommendations and key thematics that may support future educational endeavors and seeks to generate questions, and establish some conceptual guides, for evaluating an ideal through which peace education pedagogy and education more generally can be read and examined in terms of responding to global complexity.

Chapter 2

Teaching on the Edge on Chaos: The Pedagogical Implications of Complexity Theory

Introduction

Science has been undergoing a substantial transformation due to a wide range of challenges and anomalies that have emerged because of attempts to understand complex dynamic systems. Contemporary researchers examining phenomena ranging from the behavior of ant colonies (Gutjahr, 2008) and the sustainability of ecosystems (Capra, 2002) to the formation of clouds, have found a need for new ways of analyzing and describing such complexity. In the social domain, computer mediated technologies, high speed travel, global social media and other changes have led to a lessening of some of the restraints of the spacial dimensions of social life and to significant shifts in traditional social roles in an era of ‘liquidity’ and ‘fluidity’ (Bauman, 2000; Castells, 2006; Urry, 2005a). These researchers from the social sciences, humanities, and natural sciences have therefore shared a common struggle, to make sense of open systems where the relationships between the constituent parts of those systems are complex and dynamic and therefore difficult to grasp.

Educators operate within and are constantly trying to make sense of such complex systems and therefore face similar intellectual challenges. These analytical demands are no small matter in terms of responding to the world, as the majority of biological and social systems exhibit complex nonlinear dynamics (Capra, 2002). Over the past decade, increasing numbers of scholars and practitioners (Urry, 2005b) have begun to search for new intellectual resources for engaging with such complexity. While work in this area has been limited, researchers have begun to apply insights emerging from within the field of complexity theory to education (Doll, 2005; Houghton, 1989; McMillan, 2004).

This chapter highlights the efforts of such scholars through an extended literature review of the field of complexity and education. This review sheds light on complexity theorist critiques of reductionism and the shortcomings of the language of control and replication that emerged during the development of mass education. A case will be made that while the simple approaches developed during that time have accomplished some educational goals, far more pedagogically complex and diverse methodologies are needed today, especially in the field of peace education and conflict resolution.

Complexity educators (Capra, 2002; Davis & Phelps, 2004; Kentel & Karrow, 2007; Osberg, Doll & Trueit, 2009) contend that current educational practices are not adapting to the complex changes taking place in the world. They argue that these challenges occur in part due to paradigmatic limitations, which fail to recognize that change is at the heart of learning and that this occurs because reductionist assumptions within contemporary educational thought often lack the conceptual tools to grasp such dynamic change. In light of these challenges, this chapter advances the claim that complexity theory offers an important analytical resource and new language for rethinking education and the models that were popularized following the industrial revolution.

While complexity highlights the shortcomings of reductionist practices, it also offers a host of analytical and metaphorical resources to support envisioning and implementing new approaches and examining existing praxis. The edge of chaos is singled out below as an important metaframe and metaphor, which can serve educators in their attempts to make education continually relevant.

The theoretical value of the edge is significant as it draws us into a conversation about the relationship between set plans, and the chaotic forces and emergent possibilities present within

any given moment. It is a metaphorical and analytical resource, which is useful in that it continually challenges educators to reflect upon the balance between these forces and to consider the ways in which these tensions can be a source of innovation. The edge calls us to recognize that overly fixed structures can result in stagnation and/or irrelevance while complete structurelessness may mean atrophy and/or the disintegration of learning processes into chaos. An investigation of the edge reveals that there are certain methods, guiding principles, attitudes and considerations that can support educators in reflecting on and creating an atmosphere where teaching and learning continually thrive and respond to change.

This critical exploration of the application of complexity theory is intended to offer some conceptual anchor points for analyzing adaptive educational praxis in response to global complexity. It advances this dissertation's contention that the analytical and metaphorical resources of complexity can support educators in both assessing the limits of current methodology and the creative potential for change in educational praxis. Finally, it lays the theoretical groundwork for this dissertation's examination of peace education practice from a complexity lens, an undertaking that thus far has had few forerunners.

The Field of Complexity and Education

Attempts to apply concepts emerging in the field of complexity theory to education arose in the late 1980s when academics in the field of education (Houghton, 1989) took interest in the study of new approaches to chaotic dynamics (an aspect of complexity theory). Robert Stuart Houghton explained that during that time such ideas began "to receive the attention of the general educational community" (1989). In 1994, members of the American Educational Research Association (AERA) formed a special working group to study chaos and complexity. Ideas for a book on the subject were discussed within the group as early as 1998, though that project took nearly a decade to come to fruition. William Doll the editor of that work pointed out

that initial attempts to integrate ideas emerging within complexity theory proved very challenging and “various drafts of the book came forward and many essays were written and rewritten and again, rewritten” (Doll, 2005, p. xi).

In 2005, that book, entitled *Chaos, Complexity, Curriculum and Culture: A Conversation* (CCCC) was published and was the first compiled full-length work in the field. It was an analysis of cultural and historical influences on modern education and the implications of chaos and complexity to a wide range of theoretical issues in the field of education. In September 2008, another book dealing with far reaching philosophical ideas at the nexus of education and complexity theory was published entitled, *Complexity Theory and the Philosophy of Education* (Mason, 2008). In that same year the journal of Education and Philosophy devoted an entire edition to the theme of complexity and education. Increasingly, educators from around the world have become interested in complexity ideas. Significantly, Lynn Davies published *Education and Conflict: Complexity and Chaos* (2004) the only book thus far written using complexity theory as its primary analytical frame within the field of peace education.

The use of complexity theory by both academics and practioners in the field of education has been steadily growing. As a result, the literature reflects an increasing body of theoretical developments and applied insights. In 2004, the first edition of *Complicity: An International Journal of Complexity and Education* (Complicity) was launched. This publication remains the most significant repository for complexity research in education. In the past five years, articles have been written in the journal on a wide range of pedagogical issues related to moral education (Bai & Banack, 2006), sustainable school reform (Bower, 2006), educational leadership, teacher training (Fels, 2004), and the role of theater and the arts in education (Fels). Complexity researchers consistently put forward novel critiques of modern education, deconstructing

rational, mechanistic, and instrumentalist views of the field of education (Doll, 2005). It is worth nothing that while these early efforts have focused largely on theoretical developments, there have also been hosts of articles in *The International Journal of Complexity and Education* that offer reflexive accounts of applied projects (Fels, 2004). It is difficult to assess how widespread and influential complexity theory has become in education. It appears from reviewing the academic sources cited above that there are only a number of people publishing in this area worldwide. The literature suggests that work explicitly applying complexity theory within education, while broadly international, consists of perhaps a few hundred people. The overwhelming majority of the articles published thus far have been by authors from the global north. Alternatively, the effects of complexity ideas may be more widespread than the literature conveys. For example, the summary of sources above is likely misleading as many of the conceptual insights emerging from complexity theory are present in applied contexts, or appear in Web-based publishing and international literature, which remains outside of the view of ‘western’ academic sources.¹⁰ Indeed, elements of complexity theory have appeared with greater regularity in popular culture with concepts such as the butterfly effect¹¹ and emergence (Gladwell, 2000) profiled in Hollywood movies and bestselling books (misrepresented as those ideas may have been in these contexts).

While the application of complexity theory to the academic literature within the field of education has been marginal, the language of complexity has been integrated more deeply within a multiplicity of other fields and these insights have become ubiquitous. In other words, ideas

¹⁰ Several of the people I interviewed used concepts from complex theory but had not contributed to the academic literature. Complexity also informs a number of organizations that I work with including The Gathering for Justice: <http://gatheringforjustice.ning.com/> and The Integral Activism Working Group: <http://www.salon.c-integral.com/>

¹¹ The 2004 New Line Cinemas release, ‘The Butterfly Effect’ indicates how popular the term is used although the concept was severely distorted in the film.

emerging from the field of complexity appear to be making their way into pedagogical spaces through complex and unpredictable pathways and therefore may have a more widespread influence than the prevalence of published articles in traditional academic spaces suggests.

Nevertheless, it is worth exploring the growing body of academic literature on complexity and education to gain insights into the questions researchers are generating in relation to contemporary educational epistemologies. These researchers argue that education is struggling to respond to global complexity and they have sought to deepen the analysis through which this predicament can be examined. What follows are two sections that review this literature, the first providing a historical exploration of the creation of ‘modern’ education and state sponsored schooling, and the second examining diverse pedagogical opportunities emerging from applications of complexity theory.

Toward Greater Pedagogical Complexity: Critiques of Contemporary Education

To begin to understand the contemporary challenges faced within education this chapter focuses on educational history and critical changes that took place within education following the industrial revolution. These changes included a shift in values and vision that in many ways mirrored the focus on the mass production of goods. The need to educate large numbers of people ‘efficiently’ gave rise to simple teacher-centered, evaluation-based educational models that are still widely used worldwide. This exploration of the context in which contemporary educational praxis was developed highlights how reductionist approaches initially served the goals of making education available to the masses. It also investigates the problems generated by these views—problems, which complexity authors argue, have become intensified today (Capra, 1999; Davis & Phelps, 2007; Kentel & Karrow, 2007; Laroche, Nicol & Mayer-Smith, 2007).

These scholars focus on the language of control and replication that became ascendant during this time and note the shortcomings of this approach, which overtly sought to minimize

the variability of context and the individual interests of teachers and students in hopes of creating a simple replicable educational model. This created significant problems in education from a complexity point of view as this epistemological shift cut people off from vital sources of energy, innovation, and change and moved education toward a model that valued most what could be predicted, reproduced, and simply assessed. In all, a case is made here that these historical changes greatly reduced education's responsiveness to the complexity of the world and the students and educators who participate in those educational systems.

Because of this lack of engagement with GC, much of the writing within the field of complexity and education is concerned with advancing and transforming current educational practices. Complexity educators critique current methods, contending that many modern educational practices are antiquated and that "complexity theory affords basic principles on which to build new models of teaching, learning and researching" (Siemens, 2007, p. 108). On the whole, these authors join a longstanding cadre of educational thinkers in challenging the separation of mind and body, the privileging of concepts over context, the separation of students from the diverse environments in which they live and the celebration of rugged individualism that pervades modern educational approaches in the west (Boal, 2000; Gardner & Hatch, 1989; Montessori, 1936).

Some complexity educators have adopted John Dewey's concerns about both the dangers of "passive absorption of academic and theoretical materials" (Chambliss, 1996, p. 147) as well as his reservations about methods, which overreact by pandering to the whims of students with an assumption that "almost any kind of spontaneous activity inevitably secures the desired or desirable training of mental power" (Chambliss, p. 147). Complexity educators like William Doll (2005) make novel contributions in support of Dewey's contention that a larger and more

dynamic role needs to be given to “children in the life of their classes and teachers and communities in the development of curriculum and school policies and practices” (Chambliss, 1996, p. 141).

Doll also highlights the importance of examining the social context that gave birth to current ideas of best practices to be able to gauge more clearly the depths of the problems within contemporary education. Doll joins other complexity authors (Davies, 2005; Mason, 2008) in challenging the language of control that has played a dominant role within modern educational discourses for the last 150 years. He contends that the organizational tendencies within mainstream education systems are indicative of deep epistemic assumptions about self and world, which may no longer hold true especially in light of analysis emerging from the ‘new sciences’ (Doll, p. 23-26).

While many scholars have explored the historical foundations of current educational systems in much greater depth than is possible here, a review of the specific cultural and historical histories that gave birth to modern education is critical to understanding the problems many educators face today. Modern approaches can be traced back to shifts in values and vision that came about because of the implications of ‘enlightenment’ thought in Europe, and following that, with the rise of the state. The mechanistic and reductionist viewpoints¹² that emerged from that period in part paved the way for the industrial revolution and the corresponding creation of mass education and factory style schools to meet the needs of the day. Yet, while these shifts have been written about at length, (Doll, 2005; Peterson, 1960; Timmons, 1998) it is difficult to comprehend fully the intensity of change initiated by this transformation both in terms of educational philosophy and practice as it so profoundly influenced what we think of as education

¹² These terms are used interchangeably in this dissertation as is the term naturalism to refer to the ascendancy of positivist approaches.

today.

Where at one time people worked mostly on the land and with an intimate and perceived sacred connection to that land and to community, a huge shift took place prior to the industrial revolution. These changes resulted in large-scale urban migration and the rise of factory work in England and elsewhere (Adams, 1997; Timmons, 1998). This was made possible in part by an intellectual revolution that began during the enlightenment, where, freed from the intellectual restraints of centuries of theistic control, scientists and philosophers entered the ‘age of reason’ (Hobsbawn, 1998). During the Enlightenment, thinkers began to reprocess the world anew while technological advances rapidly expanded human capacity to control and manipulate nature (Adams).

The scientific view, which underpinned these sweeping epistemic changes, emphasized the discovery of general governing laws that were seen to guide the material world. It was believed that these laws could then be understood via the scientific method moving from general laws to their effects on particular phenomena. This proved helpful as scientists developed ways of knowing about nature that drastically extended their ability to predict, reproduce, and control linear processes. This new perspective and emerging scientific breakthroughs had practical benefits as they served to extend human powers in rolling back natural limits in favor of widespread materialistic gain.

In the Newtonian view, the universe worked like a huge clock or machine, and while complicated, this huge contraption could best be understood and eventually totally mastered by coming to know the deterministic processes that made it tick. In the enlightenment period, the scientific method began to be regarded with both reverence and excitement as a foolproof way to come to know the world by removing the personal and emphasizing detached observation and

intervention. This kind of ‘unbiased’ observation was considered by many an ideal way of apprehending reality as it exists ‘out there’ unencumbered by metaphysical or theological considerations.¹³

The technological race was on, as the extension of human powers of observation were seen as key to penetrating the most intimate and the outer limits of our world. The view was simple: if one could develop precise and powerful enough instrumentation and not let one’s personal biases distort their work, then the universe could be conquered and understood however complicated or distant some aspects of it may be. Moving from general laws to particular examples of how those laws work in the world, the scientific method sought to break apart complicated phenomena into ‘intelligible’ bits.¹⁴

Educationalist William Doll points to the significance of Petrus Ramus (1550–1572) whose views foreshadowed many of the changes to come because of reductionist thinking in education. Ramus influenced modern curricular thought and his methodology became influential in Europe and later in the US. Doll explained Ramus’ efforts to ‘textbookize’ knowledge, to simplify the world and in the words of Ramus himself to teach in “the reputedly scientific descent from ‘general principles’ to ‘specials’ by means of definition as bipartite division” (Doll, 2005, p. 24).

Ramus was known to refer to this as the “one and only method” for education as it is easily replicable and much faster than previously used methods (Doll, 2005, p. 24). Within this

13 This position was eloquently articulated by the logical positivists David Hume in the 18th century, Frances Bacon in the 16th century and later by members of the Vienna circle.

14 There were obvious benefits from the breakthroughs that resulted from the positivism/reductionism, as grasping simple linear laws presented considerable opportunities for predicting the behavior of various phenomenon and engaging with them in new ways. These approaches worked well then and still do today in many areas of inquiry. They increased humanity’s ability to control and manipulate natural laws within simple deterministic processes for our own benefit. Indeed, in the West, this epistemic orientation resulted in tremendous acquisition of wealth and power and breakthroughs in a range of areas including housing, medical practices, high speed transportation and virtually every area of the human enterprise thereby increasing the material quality of life for millions of people.

simple and impersonal view, educationalists then were put in a position where they had the responsibility of transferring quickly and efficiently a clearly presented conception of the world to their students. Ramus was ahead of his time, as his simplified and standardized methodology was later widely taken on-board within the context of the rise of industrialization (Doll, 2005) and an increasing desire at the time to educate the masses through models inspired by emerging forms of economic production (Robinson, 2011).

George Timmons (1988) argued in his book *Education, Industrialization and Selection* that the increase in educational access as a result of mass education, including wide-spread efforts to “educate the poor” during the nineteenth century, was a result of two basic motivations; a desire for more social control by state and religious actors and preparation for increasing economic productivity (p. 8-9). This need was brought on in part by the massive social changes that occurred during this time first with the rise of the State with its need for ‘good’ citizens and later with the onset of the industrial revolution with its need for ‘good’ workers. Timmons explains the implications of this revolution,

what this meant was that first the British economy and then others a little later...went from being concerned primarily with agriculture to being concerned largely with manufacture. Furthermore, this transformation was based on changes in technology that took a good deal of production into factories...industrial towns grew in size and number (Timmons, 1988, p. 10).

The educational institutions and teaching practices that were developed at this time were “mass-production methods of education” (Kelly, 1964, p. 75) and were applied to servicing a huge growth in potential factory workers. Myer argued:

the widening scale of machine production created a demand for better educated and specially trained persons. There was not much room in the factory for the unskilled worker, nor was there much place for the illiterate, for if he could not read the factories varied signs and instructions, its rules and regulations plainly, he could not function efficiently. (1969, p. 356)

Meyers also highlighted the critical role religion played in paradigmatic shifts that occurred at this time. He contended “historically, modern education has been influenced by many factors. The idea that the masses should be literate and that the state should help to make them so originated in the sixteenth century as a result of Martin Luther’s dictum that good Protestants must read the bible. (1969, p. 6)

He echoes Timmons claims stating:

With the rise of the national state the religious stress was superseded by a civic motive which envisioned the school’s prime function as the making of acceptable and disciplined citizens....its process was essentially to mold the child in the matrix of a preconceived culture....by imparting a body of facts and information as well as certain skills...school men gave virtually no heed to the individual interest and capacities of their pupils. These in fact, were generally deemed to be the enemies of discipline and for a schoolmaster to encourage them was something quite unthinkable. As a result, pedagogic practices became formalized and standardized, so much so, indeed, that differences in culture and environment were almost imperceptible. (1969, p. 7)

These educational shifts became the foundation for a model of education that spread globally as industrialization served the needs of imperial interests abroad. While educational assumptions about the nature of learners varied, the view of students as ‘empty vessels’ or as unfinished products was clearly ascendant during this time and largely remains so within today’s educational system despite widespread criticism of those methodologies (Freire 1970; Illich 1973; Robinson 2010). Mass education grew to take for granted that the teacher’s primary role was to “regulate the way the world ‘enters into’ the student,” (Freire, 1972, p. 49) and of administration to create consistent and measurable conditions for that type of learning. Thus, the norm in education became the primacy of the desk, classroom, and school as consistent and replicable sites for learning with desks in single file rows reminiscent of the assembly line (Robinson, 2011).

As instruction became understood generally as teacher-centered and simple, larger

philosophical questions related to how students should learn were marginalized. Learners were to be 'filled up' by 'good education,' that is through formulaic, technical and simple methodologies with students assessed for individual success or failure by standardized tests gauging their effectiveness at reproducing that knowledge. Ironically, education adopted a language of control amid feelings of great freedom arising as a result the 'age of reason' (Paine, 1794) and man's increasing mastery over nature (Scrutton, 1981).

Peterson noted that while there was:

a slow realization that society as represented by the State, had a duty to provide its members with an ever lengthening period of formal education...state as educator, has an inevitable tendency toward certain specific failings...they love the measurable because those who love the measurable can see on paper the record of their achieved results and answer criticism by means of unimpeachable figures. (Petersen, 1960, p. 262)

This, argued Peterson, has had significant drawbacks, as 'unimportant' information became important so long as it lent itself to being easily measurable. He contends that the mystery and excitement of the educational journey was difficult to measure and as a result was undervalued and even eventually disappeared (Petersen, 1960, p. 262-263).

With pedagogical views biased toward speed, utility, and efficiency, education entered the modern world and achieved the goals of educating large numbers of people while fueling rapid industrial growth. This proved helpful for creating educational systems that sought to teach large numbers of people to learn to read, write, and do basic math and to fill the various needs of the economy and technological growth over time. It also served to create an obedient citizenry and to promote and embed the values of the state at a time of great social upheaval because of large-scale demographic shifts to urban environments, exploitative economic relationships, and rapid cultural change (Petersen, 1960; Timmons, 1969). Therefore, while the rhetoric of states was often that of empowerment and freedom, modern education in the west involved a degree of

nationalist propaganda and the use of simple, consistent and controlled pedagogical practices that often discouraged critical thinking.

These mainstream educational approaches have been challenged by various educationalists (Buckman & Illich, 1973; Friere, 1970; Robinson, 2010) and others all of whom argue that these practices do not educate the whole person and do not draw out the many ways that human beings can come to know the world. Complexity theory adds to that body of work, which critiques modern educational practice making novel contributions to understanding the shortcomings of such approaches (Doll, 2005). Advocates of a complexity approach seek to balance reductionist viewpoints and approaches with a lens for understanding complex and adaptive phenomenon—to move away solely from the language of control and simplicity and toward a wider pedagogical stance. Complexity challenges positivist ideas of predictability and undermines assumptions about predictable human intervention within complex systems.

Most complexity authors (Bai, 2008; Capra, 2003; Doll, 2005; Hase, 2006; Kenyon, 2007; Stanley, 2007) point out the importance of examining the historical lineage that gave rise to modern educational models to more deeply understand the shortcomings of current interventions within education as well as exploring potential sites for transformation. They argue not that reductionism has no place in education, as it can provide stable pedagogical practices and ways of understanding sufficiently simple phenomenon, but rather that it is an incomplete approach that is not well suited to meet the demands of today.

Contemporary Challenges: Why Complexity in Education?

While integrating complexity theory can be framed in integrative and even conciliatory terms in relation to traditional education's practices, it remains on the fringes of mainstream educational discourse. This is not surprising in a field where highly prescriptive curricular

mandates and high-stakes testing from above and/or abroad¹⁵ are the norm, and textbook teaching is often considered both primary and necessary. Within this context, the possibilities for seeing such ‘radical’ alternatives as viable may be quite limited. However, many complexity educators argue that the stakes are now particularly high for change within educational institutions. These authors (Davis & Phelps, 2004; Kentel & Karrow, 2007; Osberg, Doll & Trueit, 2009) tend to do so along three major trajectories.

First, as complexity researcher William Doll (2005) noted current school systems generally educate in an isolating way, with the majority of educational institutions privileging individual work and separating knowledge into classes or disciplines with little effort to connect such varied subject matter. He joins other pedagogues, such as Freire (1970) and Illich (1973) in noting that knowledge is often seen within education as moving largely from a singular source whether that be the teacher or the textbook to the students, thus reifying oppressive relations, undermining agency and limiting the development of critical and creative capacities in learners. Complexity educators (Davis & Phelps, 2004) argue that in addition to being disempowering, these methodological commitments are not in keeping with the flow of knowledge or the patterns of relationship in which knowledge is constructed in the new information society (Castells, 2006, p. 151). They contend that in this new global social context, information is often constructed by groups drawn together by affinity and interest working in both local and distant contexts.

Authors such as Davis and Phelps also argue that this information revolution has changed the way many people communicate, research, work and live their lives; in short, it has changed the way people learn and the resources they use to do so (Davis & Phelps, p. 3). With computer-

15 The curricular pressure to adopt foreign practices (those of the US and UK particularly) by those living and teaching in ‘the south’ or ‘developing countries’ is often overlooked. This pressure is particularly relentless in post-war situations.

mediated technology, people now work with various media simultaneously and in collective configurations that were hardly imaginable just a short time ago. A great deal of this media is highly interactive and responds directly to the user.

Davis and Phelps in their introduction to the 2007 Edition of *Complicity* explain, “current transformations and emergent forms involve many minds and mediating technologies that, in turn, affect not only personal imaginations, motivations and consciousness, but also cultural senses of truth, rationality and justification” (Davis & Phelps, 2004, p. 3). They argue that as a result society is currently undergoing a major transformation that challenges “the linear print-based texts, the singular authority of mandated curriculum, and an ideal of individualism” (Davis & Phelps, 2004, p. 3). This they contend is more than simply a transformation of the processes and medium through which people communicate, learn and work together but that it deeply effects people’s sense of identity and processes through which they learn and engage with the world. As a result, they argue that traditional educational practices are becoming less effective in an informational and globalized world as reductionist educational practices increasingly seem overly simple and largely irrelevant. In all they maintain that such approaches do not position learners to excel on the creative frontiers of human consciousness, sociality or in the workplace.

Complexity authors also posed another critique of traditional educational practices as they contended that society is facing complex problems in relation to issues of ecological sustainability (Capra, 2002; Kentel & Karrow, 2007). From within this view, time is of the essence as the human species is threatening the life support systems of the planet as never before. They contend that traditional atomized, non-context-based education, which is removed from a direct connection with many ‘natural’ or ‘wild’ places, will not suffice to support learners in engaging with these far-reaching ecological challenges. They also maintain that knowledge

represented in overly static and/or compartmentalized terms is deeply problematic as natural systems often do not conform to the thematic categories learners are familiar with and therefore they struggle to come to grips with the far reaching implications of the effects of human actions within these interconnected systems.

As a result of these trends complexity educators such as Capra (2002), Kentel and Karrow (2007) all argue that current educational practices are not putting learners in a good position to understand the complex dynamics that keep living systems alive and healthy. Fritjof Capra maintains that what is needed to create ecological literacy¹⁶ are practices that can support learners in seeing the hidden connections between various systems and to navigate across and between disciplines of knowledge in a highly interconnected and dynamic world. He and his colleagues at the Center for Ecoliteracy argue that students should experience and understand how ecosystems maintain dynamic and sustainable relationships and that direct encounter with nature is necessary. As a result, they challenge the confines of the classroom and advocated for exploration of wild spaces.

If education is going to have personal and planetary relevance, complexity educators with an ecological focus argued that educational practice needs to set people up for success in learning in complex and dynamic circumstances and understanding and living within complex adaptive systems in a sustainable way. This they contend is becoming a major goal of education in such 'advanced' societies. While challenging the reductionist lens, ecologically minded complexity educators contend there is a host of examples both within the framework of complexity and beyond that can support educators in this challenge. For example, they note that indigenous people around the globe have been learning from natural systems for centuries and

¹⁶ This term was coined by Fritjof Capra.

that they may offer insights into how to developed holistic approaches to understanding these systems are.¹⁷ Empowering people to think with a systems view, they argue, is the top priority in terms of survival. Fritjof Capra sums up this position stating simply “learning to think systemically is critical to education for sustainability.”¹⁸

The third position frequently put forward in the complexity literature in support of the need for more complex approaches in education is a philosophical critique in relation to the core of education itself and how processes of learning often function. These authors’ main claim is that change, unpredictability, and mystery are at the very core of learning and they point out that this reality often stands in stark contrast to educational beliefs in the central importance of impersonal, replicable, and easily transferable methodologies (Osberg, Doll & Trueit, 2009). Therefore, from within this view, the language of management and control, which is at the heart of many modernist pedagogical and curricular journeys, needs to be challenged in this new era as it undermines education that engages with complexity.

As Laroche, Nicol and Mayer-Smith (2007, p. 71) put it ‘these kinds of models cannot be created under the guidance of a mechanistic educational paradigm that values rigid planning, standards, prescribed outcomes, and individual achievement.’” Instead, they suggest that what may be needed given contemporary demands is a different approach, one that serves learners and teachers in making sense of change and emergent opportunities. They drew on concepts used in complexity sciences and highlighted emergence, self-organization, and the importance of open systems in undermining approaches that seek too much control. These authors put forward a view that is different from that which was developed during the industrial revolution contending

17 Center for Eco-Literacy, <http://www.ecoliteracy.org/education/sys-thinking.html> October 16, 2006.

18 Center for Eco-Literacy, “Systems Thinking,” Center for Eco-Literacy, <http://www.ecoliteracy.org/education/sys-thinking.html> October 16, 2006.

that change then is not a purely chaotic force to be controlled, minimized, or deemed irrelevant. Rather they observe that change is unavoidable and must therefore be a continuous source of opportunity within educational environments.

Kentel and Karrow further this argument emphasizing the need for both mystery and knowledge in education as “mystery is the constancy of departure; knowledge the approximation of arrival” (Kentel & Karrow, 2006, p. 221). Thus in rethinking education what it is necessary is to explore pedagogies that can make room for risks and see a constancy of departure as a necessary ingredient for learning and growth. Kentel and Karrow maintain that without such vitality both teachers and students distance themselves from the structures of meaning within modern education that help render human lives intelligible. She argued “the complete subversion of mystery for the sake of knowledge has created an unimaginative aesthetic and spiritual vacuum which some have claimed to be the most significant existential challenge we face” (Kentel & Karrow, p. 87). Consequently, they like other complexity educators argue that pedagogical commitments that seek to minimize complexity in favor of tighter control result in educational structures where the natural creativity of the child or adult is educated out of them and the relevance of what is learned is obscured.

All three of these major critical threads within the complexity and education literature challenge the status quo of current educational thought and highlight a series of problems concerning the language and practices of management and control that currently dominate educational discourse. These external restraints are often not in keeping with the specific strengths and challenges of specific communities and the opportunities that may be present there. Complexity authors such as William Doll and Laroche, Nicol and Mayer-Smith challenge such educational systems, for anesthetizing learners and teachers with a repetition of

style/environment and overly simplified representations of knowledge. They make a case that change and adaptability are not peripheral to educational endeavors but rather are consistently embedded within learning.

These arguments do not necessarily suggest that reductionism does not have any place when considering the best approaches to learning about a complex world. Indeed, knowledge of concrete simple components of systems can be necessary for grasping higher order processes of organization and change within those systems. Similarly, simple pedagogical approaches can serve as essential components of more complex and dynamic processes of learning and some degree of durable structures are needed whilst educating on the edge. Rather than discounting reductionism altogether, complexity offers an important challenge to the reach of reductionist thinking warning that if taken too far, such fixed and simple-minded approaches can result in the death of complexity.

While contemporary education often relies on reductionist thinking and factory models it is important to acknowledge that there exists a diversity of practices and purposes within mainstream education. Schools are continually experimenting with changes, ranging from the installation of “smartboards” and video conferencing facilities, to the creation of academies based on alternative pedagogical practices within public schools. The critical accounts highlighted above do more than point out the shortcomings of current approaches; they emphasize the need for more well developed analytical and conceptual tools for both reading education anew and for building on existing efforts that are expanding the field of possibilities in terms of praxis.

Teaching on the edge of Chaos

Components of a system never quite lock into place, and yet never quite dissolve into turbulence either.... (This is) the one place where a complex system can be spontaneous

adaptive and alive. (Waldrop, 2002, p. 12)

If current educational methods often fail in generating education that is relevant and alive, what might it mean for educators to engage with the complex, constantly changing world in which we find ourselves? How can we embrace the unknown and honor the knowledge that emerges from the people and places in which we find ourselves? What might it mean to more fully co-author educational experiences? The quote above suggests that the moments in which learning, change, and growth are most possible are the result of a precarious balancing act. This space known in scientific inquiry as ‘the edge of chaos’ plays a pivotal role within the interdisciplinary literature of complexity theory and has been utilized by complexity educators as a conceptual resource to search for new ways of conceiving of educational opportunities.

When seeking to maximize creativity in education the edge of chaos serves as an important hermeneutic device, prioritizing being responsive to the needs of learners and the contexts one find themselves embedded within and to consider strategies for adapting to contingency. A view from the edge then requires that educators ask: what is the minimum amount of structure that would be necessary given the context? How might that structure enable individuals and the learning collective to find emergent ways to engage creatively with the questions or themes that we are working with? In this way, the edge prefigures any educational experience and offers an important meta-conceptual lens that guides the analysis of educational praxis throughout this dissertation.

It is on the edge of chaos that complex adaptive systems engage in a ‘dance,’ continually adapting to change within environments, which are also in flux. This theoretical edge is a thin space, similar to the ‘walls’ of a cell or the surface of the ocean, thin and yet dynamic, a place of simultaneous interaction and constant transformation. It is at the edge of chaos where

transformative learning may take place and it is a space toward which complexity educators continually journey, seeking both to nurture established relationships and educative processes while remaining open to change and emergent opportunities.

The metaphor of the edge of chaos is helpful, as it has been used to highlight the ways in which living systems change, adapt, and grow while still maintaining some sense of distinctive identity and structure over time. Chesters explained the dynamics that exist on the edge emphasizing:

a constant flow of energy (is needed) to enable the dynamic structure of the system to be reproduced; equilibrium on the other hand spells the death of complexity. Complex systems therefore tend toward a space between linearly determined order and indeterminate chaos. (Chesters, 2005, p. 123)

From within this view, life is continually engaged in a dynamic balancing act, and 'living on the edge' requires responsiveness in relation to the many systems of which we are a part.

In biological systems, the stakes at the edge of chaos are high because if the structure of a living system, say an ecosystem, becomes too fixed, and cannot maintain enough diversity then it will not be receptive or resilient enough to change and adapt to shifts occurring within the larger environment. Conversely, if there are not enough stable processes then a living system may degenerate into chaotic disorder. In either case, such systems will not survive over time. Put simply then, the edge of chaos is the theoretical point, the edge, where internal structure and environment continually shape each other (Waldrop, 1992, p. 12).¹⁹

If contemporary forms of education marginalize the relevance of context for the purposes of utility and efficiency then a view from the edge suggests this could have serious consequences

¹⁹ For example, a cell needs to continually adjust to its environment of which it is intimately connected to survive, through a whole host of feedback mechanisms it adjusts to disturbances, and changes in its surrounding and over time its internal processes also shift to meet these needs and as result the cell structure and processes change over time. On the other hand, while the cell changes internally it also alters that which is around it. (Waldrop, 1992)

in terms of education's adaptability and relevance over time. The feedback processes necessary to maintain responsiveness on the edge within educational contexts, for example, by allowing students to shape pedagogy or the community to engage consistently in the educational life of schools, are most often deemed a distraction and thereby often suppressed. For this reason, the edge of chaos is an important and provocative use of language when applied to education as it indicates a need to push the limits of what we think is possible and acceptable in the educational arena.

Chaos in its conversational use is an unsettling concept for many, and while educators report a sense of connection to the term in their lived experience as educators it often does not have a place in formal educational discourse. The edge of chaos then provides a trajectory for rethinking pedagogy, as it indicates that chaotic forces are not always meant to be controlled and in fact must be productively engaged with if learning is to occur. In this way, a complexity approach to education challenges many current methodological assumptions that guide our teaching based on assumptions that "if only we could control the messy conditions of learning we could better ensure student achievement" (Doll, 2005, p. 196). Educating on the edge of chaos constitutes a major shift in educational attitudes as unexpected changes in curriculum are not always to be considered 'stumbling blocks' or 'obstacles.' Complexity educators argue instead that these moments can provide crucial sources of energy increasing the likelihood of innovation and transformative learning creating spaces where people are changed by what they come to know (Capra, 1999; Doll).

Educating on the edge of chaos offers educators three guiding principles when considering ways to exemplify such a living pedagogy: 1) structure and spontaneity are partners in learning; 2) context matters as educational collectives need to continually interact with and

learn from the many systems of which they are nested if they are to remain truly alive and relevant; and 3) learning to think systemically is critical to education as most phenomenon hang together in various forms of systemic relationship.

The edge of chaos is a space that many educators are familiar with, as it is a place in which learning is often most apparent, where jumps in understanding occur through surprises or unexpected developments in the process of learning. It comes from the collective creativity and intelligence of groups, of the unfolding of processes, which may have been planned prior but that often take on a new life, yielding in the moment some level of unease or surprise. What complexity offers through the edge of chaos is a pedagogical orientation in which surprises are to be expected and worked with, not avoided.

Complexity theory then points toward an educational framework where ideas of efficiency, control, and replicability need to be considered along with processes that allow for openness to unexpected change and new sources of creativity. It puts an emphasis **both** on the resiliency of structures over time and on the continual emergence of that which cannot be predicted, understanding that each of these forces is shaped by the other. Put simply the edge of chaos suggests “geometry of surprises” and “that contingencies must be anticipated but, beyond a general expectation, cannot be predicted in any dependable way” (Scott, 2003, p. 152). The assumption that good education is built solely on the foundation of a constant knowable goal that should be unaffected by both the needs of learners and the larger context, should, therefore, from a complexity viewpoint, be challenged.

The goal then for complexity educators with such an attitude of openness is to recognize that a learning space is not a space without rules, but a space structured to produce the minimum constraints upon creativity and the maximum input of energy in terms of thought and interaction

(Doll, 2005). It seeks not only the edge but also the edges, challenging traditional ideas of where learning spaces begin and end, where learning emerges from and who is best equipped to facilitate it. Educating on the edge of chaos can nuance current pedagogical practices as it privileges creative responses to the contingent and shifting demands of the context one is embedded within and therefore disrupts a purely technical and linear sense of pedagogical praxis. The edge points to a collective reconception of knowledge production as George Siemens reminds us when stating, “context, needs of learners, institutions and teachers all contribute to the formation of valuable learning. No single avenue suffices” (Siemens, 2007, p. 108).

What then if pedagogy is not only about reproducing knowledge in predictable ways or controlling the messy conditions of learning but rather is an ongoing process of engagement, adaptation, and responsiveness within the multiple environments with which we engage? What would such an attitude of openness mean for the role of repetition, prior planning, and the need for teachers and learners to complete tasks consistently and efficiently?

In practical terms, the edge challenges teachers and students to engage with repetition and complete routine tasks with efficiency and skill and yet it searches for more. This view from the edge is supported by the work of Hatano, and Inagaki (1986) and their examinations of the conditions, skills and habits of mind that lead to both ‘routine’ and ‘spontaneous’ or ‘adaptive’ expertise. As early as 1986, these authors had flagged up the need for understanding these two different forms of expertise and the relationship between them in education. Hatano and Inagaki also developed a schema for measuring adaptive expertise in teaching and offered insights into the conditions and attitudes that support it which may be of use to researchers interested in teaching on the edge (Hatano & Inagaki, 1986, p. 262-272). While the focus here has been primarily on the importance of the type of vision, which allows one to see opportunities as they

emerge (adaptive expertise), a view from the edge emphasizes both the need to respond to emergence and to have resilient structures and ability to demonstrate routine knowledge effectively. This more complex position stands in contrast to many traditional educational models, which tend to focus more on the language of control, management, and evaluation and take adversarial stance toward change and unpredictability.

A case has been made throughout this chapter that reductionist inspired pedagogy has focused largely on cultivating routine expertise in students. These aims in education arose in response to a very particular set of social/historical constraints and influences. The limits of those ‘factory’ models have become increasingly apparent as contemporary educators face a very different set of challenges and opportunities in relation to engaging with global complexity. I have argued in this chapter that what is needed now is education that nurtures not only routine expertise but also creative and adaptive capacities in response to the complexity of the world. While theoretical resources are often lacking in the field, complexity theory then can provide a useful lens as it raises critical questions and offers a new language and analytical lens for rethinking opportunities in this arena.

Conclusion

What does all of this talk of reductionism and complexity theory have to do with education? Why should educators care about whether the universe is understood as a giant clock or as dynamic interconnected systems? Perhaps most importantly, how can these discussions aid educators in dealing with the realities of teaching and learning?

In this chapter, a preliminary examination of the history of modern education was undertaken to gain a deeper insight into the social context and function for which many contemporary educational practices were derived. This historical review highlighted the confluence of the rise of nation states and a range of social and economic changes, which were

consolidated during the industrial revolution. The focus of such efforts within education at that time was conceived of explicitly in terms of the pursuit of greater social control and the service of certain types of economic productivity, particularly factory production (Timmons, 1988; Peterson, 1960). Special attention was paid to the increasing desire on the part of states to make education available to the masses through state sponsored schools. These ambitious educational goals of molding large numbers of students in the service of both the economy and the state generated a dominant discourse that called for pedagogical practices, which could ‘efficiently’ process this surge in student numbers. The result was educational thinking that had little place for the individual interests of students or their teachers and the specific contexts in which they lived (Meyer, 1969). Thus, state sponsored education adopted a dominant language of efficiency, repetition, and control as it sought to minimize complexity, chaos, and ambiguity in the service of educating increasing numbers of its citizenry (Robinson, 2011).

The main problem highlighted in this chapter is the over application of reductionist thinking to curriculum and pedagogy. This critique built on epistemic claims advanced in the previous chapter that contend that while reductionism can excel as an analytic for interrogating a range of phenomena it struggles to make sense of systems that are complex and adaptive. This argument then called into question the hegemonic role that reductionist approaches often play in the field of education as a case was made throughout this chapter that learning is far from simple, linear, or deterministic. This chapter then analyzed the limits of such simple practices and shed light on some of the ontological and pragmatic challenges that are being felt more deeply by educators immersed within a world of increasing global complexity. This is significant as such contemporary critiques highlight the need for new epistemological and ontological orientations in the field and further substantiate this dissertations examination of the role that complexity

theory can play in examining and envisioning novel approaches in terms of responding to such complexity.

Authors within the field of complexity and education (Capra, 2002; Doll, 2005; Kentel & Karrow, 2007; St. Julien, 2005) have elucidated a host of concerns regarding the limits of mass educational methodologies that have taken on greater gravity as of late. They highlight the need for adaptive pedagogies, which can nurture systems knowledge and new ways of being, arguing that such a transformation becomes tantamount at a time when increasing numbers of scientists report that the survival of the biosphere is at stake (Capra, 2002; Kentel & Karrow, 2007). These complexity researchers emphasize that addressing these complex social and ecological problems requires a creative sense of empathetic engagement within world understood in terms of profound interconnectivity. Furthermore, other researchers in the field point to significant changes in the ways people are communicating, accessing information, and working together (Davis & Phelps, 2004). They also contend that education, which relies primarily on individual work, teacher-centered authority, and consistency of environment is not in keeping with the highly varied, international, and multimedia world in which we are living and the cultural and social changes that have emerged from those changes. They suggest that such changes are not merely technological but are resulting in significant shifts in knowledge production, which are rendering many current methodological practices largely irrelevant.

Finally, complexity educators argue that change is fundamental to learning and that contemporary educational practices since the time of mass education have focused primarily on control, management, and assessment in the service of materialistic and nationalistic goals. The implications of these critiques are far reaching and call into question many of the assumptions underpinning current educational projects. St. Juliens states the scope of this problem clearly:

We are not faced with the poor implementation of a good idea; we are faced with a habitual way of solving problems whose assumptions of separability and stability are flawed at their root for any system whose most important problems concern development or learning. (St. Julien, 2005, p. 109)

Complexity's challenge to educational praxis poses important questions that will be taken up throughout the remainder of this work: Can education respond to the dynamic and global context in which it is now situated? If so, then how? What is the balance between set plans and emergent opportunities? How can education support an empowered sense of agency in relation to the shifting and dynamic conditions of the world? Within such dynamism, how can critical learning goals still be achieved? Furthermore, how can education serve an integral function, offering processes that support learners in finding "the patterns that connect" (Bateson, 1972) rather than breaking the world apart into simple intelligible bits?

In this chapter, complexity's response to these questions was explored primarily using the concept of 'the edge of chaos.' The edge serves as an analytical tool for examining ways to create generative spaces for teaching and learning. A view from the edge highlights the need to step back and think anew about what education is supposed to do. It offers an alternative analytical frame emphasizing not only the need for efficient and skillful reproduction within educational processes but also for cognitive flexibility and intuitive sensitivity to engage with the emergent potential within educational processes. The edge brings to the forefront a focus on a fundamental creative tension within education between predetermined curriculum/pedagogical processes and emergent opportunities. It also underscores the need to engage with balances lost, gained, and renewed within education shifting the focus toward novel ways of thinking about the structure/agency/emergence dynamic that is brought to the fore by complexity-inspired praxis. These insights are significant as they disrupt the language of control, repetition, and evaluation that have been ascendant within modern schooling and open the door for new approaches within

the field.

In all, this analysis calls into question traditional views about the ways individuals and collectives can learn and the relationship between individual and collective knowledge construction. It proposes that a far more complex dynamic is at play within educative environments than often is taken into consideration within the modernist project. It interrupts the assumption that knowledge moves primarily from teachers (with set plans and textbooks) to passive students and that schools exist as separate islands within the larger community. A move toward the edge then suggests a need for adaptive expertise (Schwartz, Bradford & Sears, 2005, p. 1-51) in both teachers and students, which included both an ability to complete routine and highly predictable tasks as is valued within reductionist frames while also remaining open to mystery, the complexity of context, risk, spontaneity, and innovation.

The edge also resists efforts to focus on teachers and students in isolation emphasizing instead the importance of a continual and unpredictable flow of energy that exists between students, teachers, curriculum, and the larger systems of which they are a part. In so doing, the edge of chaos opens up a discursive space for considering the potential for transformative interactions within and across levels of educational systems and with players traditionally considered 'outside' of those systems including members of the local as well as international community.

As scholars continue to explore complexity's contributions to creating adaptive and integrative pedagogical approaches that are responsive to the dynamism of varied contexts, a more robust conversation is needed about the ways that concepts emerging from within complexity theory may be used to investigate such innovation within education. These are largely uncharted waters as the findings of complexity theory have thus far rarely been examined

in relation to applied educational practice and even less so with regards to international approaches to education. This critical exploration then intends to make complexity theory more accessible, offering an array of descriptive and analytical approaches to peace education practitioners (and educators more widely) who are often uniquely positioned to consider creative pathways for responding to global complexity. Further, it highlights the need not only for new conceptual resources but also for applied examples of educational responses to global complexity in practice.²⁰

For this reason, the next chapter will examine the field of peace education as it offers a robust body of work to analyze from within a complexity frame. Peace education has emerged over the past six decades because of the work of international networks of practitioners committed to educational change and as a direct response to complex global problems. The next chapter builds on the theoretical work offered in this chapter by providing an overview of the field of peace education that lays the groundwork for examining peace education projects ‘on the ground’ from an analytical framework inspired by complexity theory. As such, it advances the goal of this thesis of examining praxis that is resonant with the ontological insights of complexity and the possibilities for supporting learners in having an empowered sense of agency for building peace in a complex world.

²⁰ This research does not mean to suggest there is clear agreement across the field regarding which concepts and practices from complexity theory are suited best for education or how best they are interpreted. Instead, a complexity lens or analytic stresses the importance of contingency and diversity within systems, and the fact that knowledge is bound contextually and nested within multiple systems of influence and interaction and as a result that diverse analytic approaches may be needed to be responsive to those demands. Therefore, complexity undermines an overly unified or prescriptive methodological approach that assumes a high degree of control and it problematizes ‘one size fits all’ approaches in education.

Chapter 3: Peace Education: An Overview of the Field

Introduction

The previous chapter offered an overview of the complexity and education literature. It examined claims made by scholars who contended the philosophical and methodological orientation of contemporary education has had significant limitations in adapting to the unparalleled complexity human beings now face. That complexity includes a pending ecological crisis, social change on a global scale, and unprecedented technological developments, which affect the way we travel, communicate, and work. This chapter advances the claim that peace education is a vital and underutilized resource for contemporary education as it both highlights the extent of the demands of global complexity and points the way toward what is possible in terms of methodologically dynamic responses to complexity.

This is significant as education must respond to the challenges of its day to remain relevant and many educators are searching for contemporary approaches that allow them to engage within an increasingly complex web of challenges and opportunities. Peace education offers a robust and diverse body of work for supporting teachers and learners in engaging creatively and compassionately within such complexity and in meeting the pressing challenges they face. For decades, peace educators have dedicated themselves to this mission, amassing a wide range of responses to the complexities of both local and global challenges (Bajaj et al., 2008).

While peace education remains largely unknown in mainstream educational literature, it continues to attract increasing numbers of practioners worldwide (Synott, 2005). The diversity of this field has emerged because of the work of educators from both the global south and north and, unlike disciplines that are more provincial; educators within this field have sought to implement their ideas in a wildly diverse array of educational settings both inside and outside of

the classroom (Harris, 2008). As a result, peace education includes a constellation of interconnected interdisciplinary subject areas and varied pedagogical styles and spaces that offer important applied insights into the ways that educators have responded to global complexity.

This chapter then presents an overview of the field of peace education, highlighting in broad brush strokes the practices and thematic focal points that peace educators have developed in response to global complexity. It begins by exploring peace education's evolving understanding of violence as well as the larger historical developments that have shaped this complex field. This provides insights into the value orientation and context, which has given rise to its pedagogical practices.

Next, the chapter offers an overview of the subjects and thematic areas of interest that are often taught and engaged with under the umbrella of peace education. In essence, it seeks to provide insight into the ways that peace educators have responded to the question: What content should I teach that will support learners in becoming peacemakers? It is worth noting from the outset that while there is a great deal of agreement regarding relevant areas of inquiry within peace education there is no consensus on the subjects that should be included within the field. Therefore, this chapter provides an overview of some the typological work that has been done by scholars (Burns & Aspeslagh 1996; Harris, 2004) to clarify the scope of content in this eclectic field.

This chapter aims to orient the reader to the interdisciplinary frameworks that inform peace education content and this approach highlights the wide-range of individual subjects to consider when teaching about peace. On the other hand, the fragmented nature of such schema also begs the question: What might a more integrated interdisciplinary curriculum look like? In addition, what conceptual tools might help support greater synthesis and the illumination of

points of connection across various disciplines? As this dissertation focuses primarily on pedagogy, these questions simply are flagged up in this chapter as critical points for deeper reflection within the field and instead are taken up later in the analysis of peace education fieldwork.

Finally, the last part of the chapter explores the many ways that peace educators have answered the important question: What educational processes are consistent with building a more peaceful world? In examining peace education pedagogy, this chapter highlights a wide array of approaches that have been developed in the field. This chapter includes analysis of critical pedagogy, the arts, theater and dialogic practices all of which have been embraced as a response to the alternative values of peace education and the diversity of contexts in which it has been implemented. While the positional ethics of these approaches can vary greatly, such differences also provide important opportunities for rich conversations within a field, which at its best seeks to embrace rather than reduce methodological complexity. This general overview of the various pedagogical approaches, values and thematic areas of interest that animate the field of peace education, provide some of the necessary groundwork for an analysis of peace education from within a complexity lens, a project that is taken up throughout the remainder of this dissertation.

What is Peace Education?

Peace education holds as a foundational principle that violence can be transformed, avoided, and overcome. This assertion is a radical notion for many people who hold that violence is inevitable and ultimately is a powerful part of human nature that cannot be reined in. For example, skeptics within the school of realist thought in political science and international relations (Korab-Karpowicz, 2010) argue that violence is a part of human nature that human beings cannot resist and that as a result violence at home and abroad is inevitable. From this

perspective, it often is asserted that the only hope for a peaceful world is using force as deterrent and by working for balances of power in political affairs to minimize violence (Fry et al., 2004).

Peace educators contend that this view is too narrow in that it focuses on a single element of human capacity—violence—and assumes it to be the most powerful of all forces affecting behavior. This unrealistic and pessimistic view of the world, they contend, becomes a self-fulfilling prophecy. When these historical/cultural assumptions translate to the educational environment, the effects are devastating.

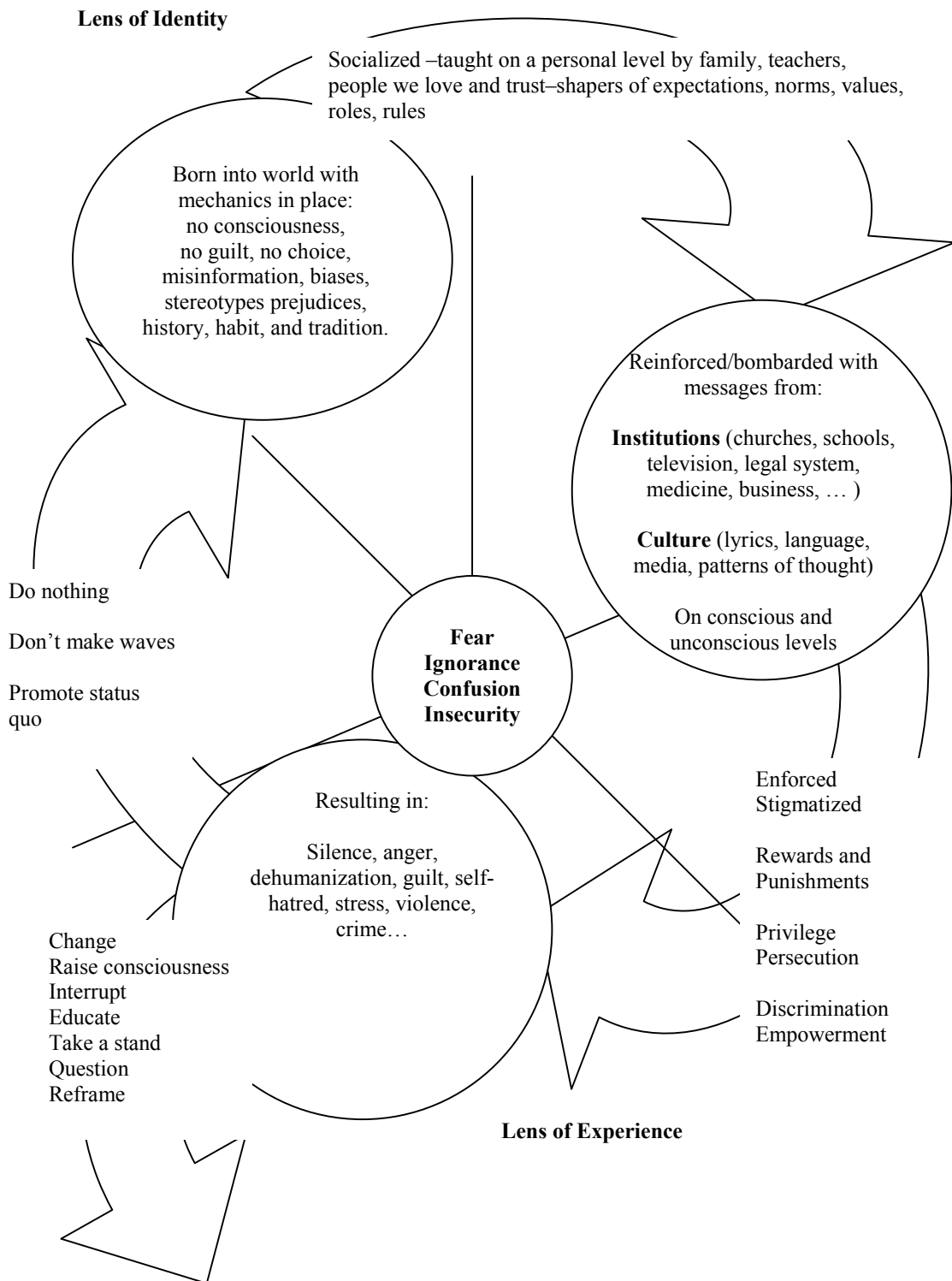
A researcher writing on the ineffectiveness of ‘zero tolerance’ approaches to dealing with violence in schools in the U.S. accurately states, “teaching for peace and social justice is an insurmountable task when the institution assumes the worst of its teachers and students, and implements policies that reflect such an assumption” (Goldstein, 2005, p. 49). These assumptions can easily be seen as manifest in schools where metal detectors, personal searches, and school-wide ‘lock downs’ are the norm. Recent efforts (McKinley, 2008; Vertuno, 2011) to arm teachers in high schools and universities within the US with concealed handguns offers a window into the degree to which force and fear underlie many educational efforts. These responses are generated from within a larger cultural context, which often finds violence necessary or inescapable and therefore struggles to find the creative assets necessary to resolve conflict nonviolently. Lennart Vriens argued:

A culture that accepts this (violence) as unavoidable can offer children no creative challenge while growing up and building their future. Such a culture- a war culture I would call it-is a culture, which will at some time come to an end. It will disappear because of its own contradictions. (Burns & Aspeslagh, 1996, p. 341).

Peace education as an academic discipline is united insofar as it challenges fatalistic assumptions about human nature, which see people’s tendencies toward violent action as uncontrollable or unavoidable. It instead offers a view (Harris, 2002) where personal and social

orientations towards violence are seen as malleable and affected by social perceptions and cycles of socialization that can be changed. The ‘Cycle of Socialization’ diagram below illustrates one such model for understanding processes that lead to oppression and violence and offers some simple strategies for shifting these patterns (Note: the arrow pointing down includes the concepts change, raise consciousness, interrupt, educate, take a stand, question, and reframe).

Cycle of Socialization



Created by B. Harro (1982). Referenced in Adams, et al. 1997 Teaching for Diversity and Social Justice

The field of peace education embraces a larger picture of human potential and makes a case that the degree to which individuals and societies will use violence and accept its usage is linked in part to the extent to which they have been exposed to alternative values and methods for transforming conflict and oppression (Harris & Morrison, 2003; Clayton et al., 2001).

Yet, peace education is more than a search for alternatives and solutions to violence. It seeks to generate creative opportunities to redefine the human enterprise and to engage with a fuller sense of personal and social responsibility. That shift requires a sense of both possibility and humility, as Vriens pointed this out when he writes:

We need a new narrative, whether we like it or not. It cannot be a totalitarian story, so it must be more modest than that of the Enlightenment. In that new human challenge the human being will not be able to pretend that it is possible to fully rule the world and its future. We shall have to respect the limits that nature and the environment place on our culture. Nature and world should recover their intrinsic dignity and humankind should realize that we are part of nature and the world. It seems unlikely that our technology will be able to solve our modern world's problems. (Burns, 1996, p. 352)

This sentiment is very much in keeping with the orientation of complexity theory, which greatly undermines the predictability of human intervention within complex systems instead seeking to understand what Manuel Delanda calls the “mechanisms of immanence” (Delanda, 2005, p.123). Peace educators argue that violence is not an uncontrollable part of human nature and that violent intervention often assumes too high a degree of prediction and control. Peace educators instead contend that humans need not exist in exploitative relationships to each other or within the many systems of which they are a part and that learners can be supported in seeking these goals. In this way, peace education is expansive in that it seeks to draw out a fuller range or creative, critical, and compassionate potentialities within human beings than do traditional methodologies.

On the other hand, many peace educators agree that the field should at least in part be

dedicated to challenging and transforming violence. This raises a fundamental question within peace education and research: how is violence to be understood? Indeed early conceptions of peace education emerging in the post war period did conceive of peace as the absence of war or direct physical violence and this conception often is referred to in the literature as ‘negative peace.’ However, this conception of peace always was contested and the ways in which peace educators have understood violence has changed markedly over the past six decades (Harris, Fisk & Rank, 1998).

In 1969, Johan Galtung coined the concept of “structural violence” noting that it is present any time “human beings are being influenced so that their actual somatic and mental realizations are below their potential realization” (Galtung, 1969, p. 167-191). From within this view violence can take many forms, “that which is *personal*, or direct (involving an actor who commits the violence), and that which is *structural* or indirect. Both cases involve people who are hurt or manipulated, but in the former someone is doing the violent action to another; in the latter the “violence is built into the structure and shows up as unequal power and consequently as unequal life chances” (Galtung, 1969, p. 171).

Inspired by Galtung’s work, peace education has become increasingly concerned with both the absence of personal violence and the presence of social justice. Without direct violence and within a society striving to create equal opportunities for all therein, lie the possibilities for “positive peace” (Galtung, p. 171) or what is often referred to in the field as ‘sustainable peace.’ Sustainable peace both can be understood as:

a pattern of cooperation and integration between major human groups... [It] is about people interacting in cooperative ways; it is about social organizations of diverse peoples who willingly choose to cooperate for the benefit of all humankind...it is a state so highly valued that institutions are built around it to protect and promote it. (O’Kane, 1991)

With these expanded conceptions of peace, peace education has grown to include attempts to

prevent and respond direct violence as well as seeking to transform structural violence as well. Thus, peace education in its most comprehensive forms includes striving, visioning and working together for a world that affirms the highest creative, intellectual, and moral potential of each human being (Adams, 1997).

A Short History of Peace Education

Historical Roots

If as Gandhi said peace is as old as the hills then it may be that the desire to educate in a way that promotes peace is equally as old. Many scholars trace the rise of contemporary peace education to the period following the two world wars in Europe. Robert Aspeslagh contends the Second World War provided “a convenient point from which to trace the development of peace education as it now exists” (Lazlo et al., 1986, p. 185). Yet, while peace education often is cited as having gained traction in the middle of the twentieth century (Bajaj et al., 2008; Harris, 2008) many of the ideas and practices central to the field, existed long before that time. It is important then to note that the roots of peace education can be traced outside of western and Judeo Christian thought and date back to ancient times.

The practice of yoga and its training of the mind and body for living in harmony with all beings is believed to have begun 5000 years ago and archaeological evidence depicting the practice of yoga has been found and dated back to the third millennium BC (Worthington, 1989, p. 9). The Jain tradition, which is often traced back to 600 BC, (Sharma, 2002) derived the term Ahimsa (nonviolence) and promoted the consideration of a series of activities, prohibitions and habits of mind to avoid harming others and minimizing harmful effects on all living things. Indeed Guatma ‘the Buddha’ was raised in the state of Bihar in India where Jainism developed and he was exposed to the ideas of Jains in his youth. Gautama also stressed the importance of mental training and discipline in the pursuit of nonviolent living. After his death, Buddhism

migrated throughout the East developing a diverse array of educational systems for cultivating inner peace, resolving conflict and living in community (Bajaj, 2008).

While peace education can be traced back to ancient times and to cultures in various parts of the world, the literature in the field is currently dominated by voices from the west. A comprehensive cross-cultural historical account of the roots of many of the ideas that influence peace education is yet to be undertaken. Unfortunately, this literature review also reflects this bias; however, it also seeks to contribute to diversifying the field by including scholars from around the world and examining outstanding examples of complexity-inspired approaches from the global south in chapter seven.

Scholars have noted the key role that ideas dating back to Greece have played in the development of the field of peace education. According to the Encyclopedia of Peace Education, “almost since Thucydides wrote his History of the Peloponnesian War, scholars have come to consider international relations as essentially dominated by the two opposed but coexistent forces of conflict and cooperation. As the years passed, these two axes became the corner stones from which emerged many subfields of study.... Peace Studies and international cooperation became, of course, two of the most prominent domains” (Lazlo et al., 1986, p.323).

Robert Aspeslagh contended “the first direct call for a study of peace education was made by the famous Czech educator Comenius (1592-1670)” (Lazlo et al., 1986, p. 183). Comenius argued that studying ways to promote peace was essential and that “moderation and love are necessary to obtain peace in a restless world” (p. 183). Among classical educational thinkers, Rousseau played a central role in shaping modern peace pedagogy. In his work *La Nouvelle Heloise*, *Le Contact Social* and *Emile ou L’Education*, he emphasized the natural goodness of the child, the importance of civic engagement, the power of environment on the learner, and the need

for individuals to have the creative space to generate their own ideas. These themes play an important role in field of peace education and are still discussed vigorously in the literature to this day.²¹

The Influence of the Reformpädagogik and Progressive Education

While the influence of what Aspeslagh referred to as ‘classical thinkers’ affected the lineage of peace education he made clear the central role of thinkers associated with both the ‘Reformpädagogik’ and ‘Progressive Education’ in influencing the field (Lazlo et al., 1986). Montessori and Tolstoy, both associated with the Reformpädagogik, put forward ideas that forever shifted the trajectory of peace education. Further, their contemporary Tolstoy, warned of the violence of the state and its anesthetizing qualities on the human mind, a theme drawn on later by key thinkers such as Friere, Illich and others. (Bajaj et al., 2008) Tolstoy made a case for peace education stating that people “should be educated for self-reliance, morality, brotherhood and peace instead of brutality, ignorance, apathy and military life” (Lazlo et al., p. 184).

Montessori (1949) much like Rousseau (1762) thought that drawing on the natural inquisitiveness of the child was essential for promoting peace and both educators made a radical case for more student-centered methodologies. While Montessori’s method can only briefly be explored in this chapter (it will be explored in much greater detail in chapter four) it must be reviewed here as it exerted such a profound influence on the field in terms of emphasizing the importance of child initiated learning. In her approach, “the basis...is respected individual choice of research and work, and uninterrupted concentration rather than group lessons led by an adult” (Duckworth, 2008). Montessori believed the natural inquisitiveness of the child should be what drives the learning and that critical thinking should be nurtured. Montessori also spoke explicitly

21 Drawn from Jean-Jacques Rousseau on nature, wholeness and education The online encyclopedia of Informal education <http://www.infed.org/thinkers/et-rous.htm>

about peace and education emphasizing the importance of what she saw as the values and content of global citizenship, of building moral character and of addressing conflicts in constructive ways in the classroom (Duckworth, 2008).

Ian Harris described peace education as the intellectual space where “John Dewey, Maria Montessori and Paulo Friere meet” (Harris, 2008, p. 184) and while such an assertion may be too narrow, the immense influence of the methodologies of all three should not be underestimated. John Dewey is a paradoxical figure from a peace education point of view as he was often uncritically nationalistic, assuming that the American way of life was best, (Harris, p. 184) and yet he did later in his life spent much of his time arguing against nationalistic indoctrination and for the need for greater respect and understanding between peoples and nations. He, like Montessori, emphasized the importance of critical thinking and personal initiative and focused on project-based work as a pathway for developing critical and creative capacities while providing opportunities for learners to find their own solutions to problems.

World War I affected Dewey deeply and he emerged from that experience with a transformed understanding of the role of schooling. From then on Dewey was overt in his focus on schools as spaces to challenge the uncritical nationalistic assumptions that promoted war and military recruitment (Howlett, 2008). He explained that the role of an educator was to “make it more difficult for the flames of hatred and suspicion to sweep over this country in the future” (Dewey, 1923, p. 516). Dewey was ahead of his time in advocating for international understanding and peace through greater global awareness. C. H. Howlett explains that Dewey hoped:

given proper direction, schools could become dynamic instead of reflexive agencies; as instruments of reform, schools could search out and reinforce concrete patterns to remake society in the name of peace while at the same time enabling each student to realize his or her potential for building a nonviolent world. (Howlett, 2008 p. 2)

Dewey was ahead of his time in that this sentiment about the role of schools became much more common in Europe and the US later after the effects of the ‘two great wars.’ Albert Einstein also captured the zeitgeist of the moment when he commented, “the splitting of the atom has changed everything, save our way of thinking, and thus we drift toward unparalleled catastrophe” (Reardon, 1993, p. 27) as he offered insight into the conundrum felt during this time. It was in this traumatized and reflective social and political context that peace education emerged from the aftermath of those two conflicts. Most people in Europe and the US had been affected personally by the wars and a few people of strong will were moved by the sentiment never to see such atrocities happen at home again (Harris, 2008).

Contemporary Influences

In this early phase of peace education, the field tended to focus mainly on “creating a climate of international understanding which would lead to the world becoming more peaceful” (Burns & Aspeslagh, 1983). Proponents of international understanding and cooperation focused on both cultural awareness and face-to-face diplomacy while highlighting the role of states and international law for creating a peaceful world order in the post war period. Later in the 1960s with the cold war reaching a peak and social upheaval in the US and abroad in response to the Vietnam War felt by many, peace education began to take on a more overtly critical focus. During this time, a greater degree of emphasis was placed on individual civic responsibility and the need for a radical reordering of cultural values and priorities in the west.

With the perceived threat of imminent nuclear war, because of the arms race dominating much of the consciousness of this time, the theme of disarmament grew became an important focus within peace education during this period. At the same time, the global south’s role in fighting post-colonial exploitation also drew the interest of peace educators around the world (Webel & Galtung, 2007). A broader debate began to arise about the focus of peace education

and its research and increasing demands were made to expanded definitions of the field. During this time, new interpretations of violence were put forward that shifted the focus from direct physical aggression and violence between individuals and states to ideas of cultural and structural violence emphasizing oppression (Galtung, 1965).

Paulo Friere's work *Pedagogy of the Oppressed* redefined the field as it drew parallels between exploitative colonial systems and traditional ideas about educational pedagogy. He challenged revolutionaries of all bents warning that many were using the tools of oppression for the purpose of liberation (Freire, 1972). He highlighted educational assumptions about learners as 'empty vessels' that should be filled by 'good education' where it is assumed the teacher's role is then to "regulate the way the world 'enters into' the student" (Freire, p. 49). He referred to this traditional form of education as the 'banking method,' as information was deposited only to be withdrawn later in exactly the same form as it entered. He contended this was disempowering because in practice, it trained students to be passive and uninvolved in deciphering what is valuable knowledge and their role in constructing or altering it. By leaving that task to so-called 'experts' Freire highlighted that students gave their power away.

He argued then that disempowering effects of such education extended far beyond the classroom. "Translated into practice, this [banking method] is well suited to the purposes of the oppressors, whose tranquility rests on how well men fit into the world the oppressors have created, and how little they question it" (Freire, 1972, p. 50). Illich critiqued the same process arguing "by making men abdicate the responsibility for their own growth, school leads many to a kind of spiritual suicide" (Freire, p. 60).

Because of such critiques, peace educators began to engage with 'radical' pedagogical approaches to promote peace in the process of education. Frieze's seminal work *Pedagogy of the*

Oppressed exerted deep influence on the field and many educators agreed with his claim that liberatory education must create spaces for the oppressed to become active in asking questions and challenging the oppressive conditions of their lives. It was argued that people should not be the objects of research or action by some revolutionary vanguard but instead be the architects of their own transformation.

Throughout the 1980s and 1990s, peace education continued to become more complex by integrating both disarmament and a wider array of radical pedagogical practices (Harris, 2008; Reardon 1997; Aspeslagh, 1996). Feminist writers played a pivotal role in this period by highlighting gender-based violence and the role of women as peacemakers (Reardon, 1993). Feminist authors (Brock-Utne 1998; Reardon, 1993, Woehrle, 1995) have made important contributions by generating a diverse body of critical analysis, which challenged both traditional, and liberatory frameworks for their patriarchic blind spots (Lather, 1998) and offering a range of alternative epistemologies (Fuller, 1992).²²

At the same time, growing global environmental movements began to exert their influence on the world stage (Satya, 2002) and in the field of peace education as well.²³ Mary Lee Morrison explains “Elise Boulding’s writings and those of other feminist in the 1970s laid the groundwork for the work of later educators who embraced ideas of connectedness, caring and the importance of thinking globally and acting locally. Significantly, many of Boulding’s ideas predated contemporary thinking on the importance of ecological sustainability” (Morrison, 2003, p. 2). During this time, peace researchers increasingly began to see the linkages between conflict and resource scarcity, (Homer-Dixon, 1994), which later solidified the connection between

22 The University of California Berkley has compiled an excellent bibliography of feminist influences within peace studies which can be accessed at <http://globetrotter.berkeley.edu/GlobalGender/fempeace.html>

23 Many of the major theorists in peace education including Reardon, Galtung, and Harris cite ecological concern as a central aspect to peace education.

environmental concerns and peace education. Environmental education has since become a mainstay of peace education efforts.

The 1980s and 1990s also saw the growth of conflict resolution as an important area of inquiry within peace education. The Quakers who had played a leading role in the field and spearheaded efforts to bring interpersonal mediation into peace education after the post war period had long stressed mediation. Conflict resolution efforts continued to grow and later community mediation activities, which had taken hold in North America during the late 1970s, began to be integrated into extra-curricular activities as part of school violence prevention strategies in North America and Europe. Conflict Resolution quickly became the ‘golden child’ of peace education efforts in North America (Girard, 1996) in the 1990s with many schools adopting conflict resolution programs. While still on the fringes of state curriculum, conflict resolution programs became so widespread that some localities like San Francisco in the United States boasted that three-fourths of their schools had peer conflict managers (Inger, 1991).

In this new millennium, peace education continues to be an evolving and complex field (Bajaj et al., 2008). It offers one of the most robust depositories for pedagogical practices and inquiry into potential responses to these and other complex global issues. To begin to understand just how expansive and dynamic this field is it is necessary to explore in greater depth both the subjects that peace educators focus on and their practices for supporting and facilitating learning communities that embody the values of peace and nonviolence. The following two sections take up this call, by offering an overview of peace education content and pedagogy from within a global view.

What Do Peace Educators Teach?

With a field focused on as all-encompassing a concept and process as peace, perhaps it is

not a surprise that scholars vigorously debate the relevant fields of study when considering a comprehensive and balanced approach to the field. There is widespread agreement (Harris & Morrison 2003; Reardon, 1988) that peace education must take into consideration a vast array of interdisciplinary areas. Peace education is an interdisciplinary endeavor to develop solutions to direct and indirect violence (Harris, 2002, p. 22). While peace education ideally should seek to challenge violence, it also is tasked with envisioning and creating futures that are more peaceful. This opens the door to a huge array of potential areas of inquiry for peace educators to explore. Table 1 (below) illustrates some major thematic trends in the field and highlights the authors who emphasize the importance of these areas of inquiry.

Table (1): Peace Education Content Areas

Content Areas	Stanley Heywood ²⁴	Loretta Castro	Robert Aspeslagh	Lynn Davies	Birgit Brock-Utnes
Economic Justice	Hunger and the politics of food distribution, World Economy and Economic Justice	Development based on justice	Development		
Militarism	Militarism and the arms race	Disarmament			
Environment	Ecological Balance,		The Environment		
Social Change	Human Rights and Social Justice, Culture, Community, Values and Change	<i>Peaceful alternatives:</i> nonviolent conflict resolution, human rights,	Raising historical consciousness and cultivating the skills for political participation (for example being able to read codes of law, lobby, organize etc.) ²⁵		

24 Heywood, S. J. (1999). Peace education for youth. In: P. de Cuellar, J. and Y. S. Choue (eds.). *World encyclopedia of peace*. 2nd Ed. New York, Oceana Publications. 196-199.

25 Burns, R. J. & Aspeslagh, R. (eds). (1996). *Three decades of peace education around the world: An anthology*. London, Garland Publishing.

Table (1)—Continued

Content Areas	Stanley Heywood	Loretta Castro	Robert Aspeslagh	Lynn Davies	Birgit Brock-Utne
Peace	Peacemaking processes, Religious perspectives on justice and peace, Alternative Futures	<i>Peace: Studying different conceptions of peace from the personal to the global</i> ²⁶	Peace (processes),		
Conflict Studies	Dynamics of violence	<i>Conflict and violence: studying problems of direct, structural, and ecological violence and root causes.</i>	Analyzing conflict and imagining you were part of it, examining the broader social context of conflicts with an emphasis on structure (for example the effects of international laws and treatise on a conflict, investment patterns, communication structures and access etc.),	“a critical analysis of newspapers, TV reporting and government information campaigns.” ²⁶ “a sound political education needs to include a critical appraisal and awareness of different forms of democracy, and the consequences of different systems in particular countries.” ²⁷	
International Studies	Global problems, International laws and Organizations, Regional Studies		The International Political system		
Gender	Women and world order,				Examining the many ways in which current cultural expectations of masculinity reward aggression and violence. ²⁸ A web of cultural messaging tailored to the themes of war, violence and aggression for boys. ²⁹

Scholars prioritize various schemas for making sense of the appropriate content areas

within peace education and the table above underscores both the areas of shared interest and the

26 Davies, L. (2004). Building a Civic Culture Post-Conflict. *London Review of Education* 2(3).

27 Ibid, p. 242.

28 Brock-Utne, B. (1985). *Educating for peace: A feminist perspective*. New York: Pergamon Press.

29 Ibid Brock-Utne agrees with Garcia “that peace education must begin to legitimize a new category of man, a nonviolent man” to build peaceful societies.

divergence of focus within the field. Authors such as Aspeslagh, Davies, and Heywood agree with Castro in focusing on the importance of international issues within peace education frameworks. Heywood emphasizes the need to examine the profound effect of “political actions within countries, and between countries, on domestic and international peace” (Heywood, 1999, p.197). He also focuses on understanding national political processes and noted the need to address transnational global problems by analyzing and taking action on “hunger and the politics of food distribution” as well as “working for ecological balance, understanding international laws and organizations, human rights, social justice, and the world economy” (Heywood, 1999, p.197).

Aspeslagh takes a different approach to international issues offering a deep analysis of the importance of understanding political and economic institutions and processes when exploring possibilities for collective action. In discussing peace education, he stresses the importance of examining the broader social political context of conflicts (e.g., the effects of international laws and treaties on a conflict, investment patterns, communication structures, and access) (Burns & Aspeslagh, 1996). He contends that comprehensive peace education projects therefore need to raise the historical consciousness of learners by “cultivating the skills for political participation (e.g., being able to read codes of law, lobby, organize) if they are to navigate the possibilities for change within a complex social setting” (Burns & Aspeslagh, 1996, p. 165). These structural approaches within peace education provide the potential for greater curricular balance as many peace educators focus primarily on interpersonal dynamics and personal processes of change.

Lynn Davies supports Aspeslagh’s focus on civic education and she contends it needs to be included as a vital part of peace education curriculum. However, she astutely argued that civic

action is constrained by a complex set of factors and that a critical perspective is needed for informed action in this arena. She maintains, “a critical analysis of newspapers, television reporting and government information campaigns” (Davies, 2004) is necessary for truly informed civic engagement. She goes on to stress that civic education should be seen from an international view as “a sound political education needs to include a critical appraisal and awareness of different forms of democracy, and the consequences of different systems in particular countries” (Davies). While Davies focuses on civic education within a democratic framework, she also makes room for critical discussion of the strengths and weaknesses of democratic systems and the need to consider the complexities of how international contexts affect the feasibility of democracy (Davies).

Birgit Brock-Utne joins other feminist authors in bringing the cultural landscape to the foreground of peace education, eloquently arguing for the importance of illuminating the ways in which social expectations of masculinity reward aggression and violence (Brock-Utne, 1985). According to Brock-Utne the web of influences that socialize boys toward violence, include the toys young boys play with, exposure to media images representing violent masculinity and a web of cultural messaging tailored to the themes of war, violence and aggression (Davies, 2004). Brock-Utne agreed with Garcia “that peace education must begin to legitimize a new category of man, a nonviolent man” (Brock-Utne, 1995) to build peaceful societies. Heywood also stressed gender arguing that boys and girls should be brought up with a sense of equal importance (1999). He contends this need for gender equality is of global significance in terms of supporting peace processes and that women and world order be a core area of study within peace education (Heywood, 1999).

In *Teaching Peace in Scotland* (Romano, 2005), I built on Ian Harris’s (2002) work and

identified nine areas of study that frequently appear in the peace education literature as a response to global issues. These key content areas included: peace history, nonviolence education, disarmament education, media literacy, international education, human rights education (HRE), development education, environmental education, and conflict resolution education. That work also emphasized the importance that many peace educators place on bringing a critical lens to the analysis of gender, race, and class and the need to examine structurally reinforced privilege across all peace education content areas.

Developing Holistic Curricula

Given the interdisciplinary scope of the field of peace education, developing a holistic curriculum is a daunting task. However, numerous authors (Bajaj et al., 2008; Harris 2004) have attempted to offer insight into the larger purpose, guiding themes and underlying frameworks that guide such efforts. Ian Harris (2004), writing in the *Journal of Peace Education*, establishes what he refers to as the ‘postulates’ of peace education. His postulates build upon the tenant that conflict is omnipresent in human life and he contends that peace education should: 1) explain the roots of violence; 2) teach alternatives to violence; 3) adjust to cover different kinds of violence; and 4) view peace as a process that varies according to context (Harris, p. 5).

Peace education in Harris’ view is very much a response to violence and he contends that it can be overcome and transformed. He seeks then primarily to support learners in transforming conflict and finding alternatives to violent action. Yet, while Harris contends that peace education content areas need to be responsive to these challenges he also acknowledges that it should strive to do more than solely address issues of violence (Harris, 2004, p. 12).

Noted futurist David Hicks explains the importance of a positive vision explaining that the creation of ‘preferred’ future requires engaging both with what we want to say no to as well as embracing a vision we want to build on for the future (Hicks, 1995, p. 171). This is an

important point Hicks makes, as peace educators find themselves balancing the need to challenge and search for alternatives to violence in their curriculum as well as exploring imaginative compassionate and sustainable ways of living together within a complex global world. Hicks built on Polak's (1972) view arguing that utopian exploration of possible futures is essential as "potent images of the future can act like a magnet, drawing society towards its envisioned future. A society with no positive images of the future, he argued, indicates a society in decline" (Polak, p.171). Indeed, the literature suggests that peace educators interested in creating comprehensive curriculum that can shift entrenched patterns of violence face very real creative challenges and may need to consider new approaches (Ardizzone, 2001; Reardon, 1988).

In continually responding to the demands of educating for peace in a globally complex world, peace educators draw on a wide range of fields and often adapt their thematic areas of focus over time. This task is challenging as it involves creatively engaging with various fields simultaneously. Harris noted that many of these different subfields within peace education have, 'different theoretical assumptions...different peace strategies...and different goals' (Harris, 2002, p. 8). As such, peace educators often traverse multiple embedded systems of values and ethics and analytical frameworks in their daily practice. While peace educators regularly navigate difference across these curricular disciplines, they also are presented with greater opportunities to see points of connection across thematic areas as there has been an increase in research that exposes the interconnected relationships between environmental stresses, human violence, and human health (Synott, 2005, p. 7).

These endeavors to create increasingly comprehensive curricular frameworks (Ardizzone, 2001; Harris, 2004; Reardon 1988) are a critical component of peace education practice in response to global complexity. However, to obtain a fuller picture of how peace education

engages with complexity it is also necessary to examine the pedagogical resources that have been used within this methodologically diverse field. Peace educators often use both interdisciplinary curriculum and diverse pedagogical practices in their attempts to negotiate the demands of global complexity and their global/local positionality. The following section furthers this exploration of comprehensive peace education approaches by examining some of the most prevalent pedagogical practices that are used within the field.

How Do Peace Educators Teach?

There is abundant analysis, with documentation, that demonstrates that not only the content, but also the structures and processes of our educational institutions play an important role in the reproduction of the status quo (Perez, 1999, p. 308).

As peace education is concerned with challenging direct, structural and cultural violence, in essence challenging the status quo, the ways in which we teach and learn and the values that underpin our efforts are of the utmost concern. Peace educators continually are faced with the question; what educational processes and structures are most aligned with promoting peace and justice? Their answers to this important question are diverse and varied much like the contexts in which they engage in their work.

For the past five decades, scholars have been compiling a comprehensive set of strategies and views based on the efforts of peace educators who are responding to the challenges of pedagogical innovation in response to global complexity. There is an ever-increasing body of work (Bajaj et al., 2008; De Cuellar & Cho, 1999; Harris 2004) that catalogues the attitudes and values of peace education, which *The Encyclopedia of Peace* describes as “positive vision, reflection, critical thinking and analysis, decision-making, imagination, communication, conflict resolution, group building (skills)” (De Cuellar & Cho, p. 68). They contend that peace education

seeks to support:

experiences in developing sportsmanship, nonviolent solutions, friendliness, appreciation and respect for differences, study of other cultures, compromise while maintaining principle, patience, inclusiveness, and a recognition of the world and its inhabitants as a joyful potential for peaceful attainment that constitutes a basis for better solutions of problems by adults. (De Cuellar , 1999, p. 199)

Synott emphasizes that peace education takes an “essentially benign view of human nature” and as a result seeks to cultivate the nonviolent potential of the individual and learning collectives in building creative and just processes for learning. According to Synott, peace education pedagogy “is rooted in this conception of human goodness, such that individuals find their true identity and expression through adhering to nonviolence” (Synott, 2005, p. 9). This pedagogical attitude, which looks to expand opportunities for student leadership and autonomy draws from a wide range of sources of inspiration and includes educational thinkers such as Maria Montessori, John Dewey, Paulo Friere and many others.

Indeed the pedagogical principles ascendant in the larger progressive schooling literature, which include “a critique of authority relations in the teacher pupil relationship; a commitment to non-hierarchical, more communal cooperative classrooms; and the assumption that learning should begin in, and value students’ experiences” (Manicom, 1992, p. 366) are highly internalized within the field of peace education. The peace education literature draws from a wide array of approaches it often includes participatory, experiential, liberatory, creative and critical pedagogies. While it is not feasible to explore the full range of these pedagogical methodologies in this chapter, several popular strategies will be highlighted here, including: dialogue, the arts, theater, and critical pedagogy. These pedagogical forms are the building blocks of many peace education efforts and therefore are helpful to understand even while work in the field often reflects a more emergent and difficult to categorize synthesis of these and other forms.

Dialogue

I begin with dialogical pedagogical processes as these methods often form the bedrock of many peace education programs (Harris & Morrison 2002; Noddings, 2008; Reardon, 1988). Dialogue involves learning to communicate effectively and to listen and share ideas and needs without using threat and force to change the views of others (Noddings). Dialogue is often used within peace education as it provides opportunities for learners to gain a deeper sense of their context and situatedness as members of a learning collective (Kennedy & Kennedy, 2010). Ideally, in dialogical processes all members are able to participate and to assess their own ideas in relation to the ideas of others. As a result, dialogue multiplies sites for feedback, perturbation and can help model peaceful relations since, as a prerequisite, there must be a healthy degree of symmetry and equality for true dialogue to take place (Gadamer, 1979). Dialogical approaches to pedagogy can also support learners in maintaining a sense of curiosity in relation to difference, which is also central to conflict resolution approaches (Gerard, 2003).

The German philosopher Hans-Georg Gadamer was a well-known educator and advocate for seeking understanding through dialogue and conversation, which he described as a process of at least two people actively working to understanding each other. He explains:

Thus it is a characteristic of every true conversation that each opens themselves to the other person, truly accepts their point of view as worthy of consideration and gets inside the other to such an extent that they understand not a particular individual, but what they say. The thing that has to be grasped is the objective rightness or otherwise of his opinion, so that they can agree with each other on a subject. (Gadamer, 1979, p. 347)

This way of approaching knowledge assumes that a degree of respect should be afforded to each individual and calls for a greater level of symmetry in terms of power and influence in social relations than many teacher-centered approaches do. Knowledge is understood in this case as both relational and distributed as each person is assumed to have a unique window on reality, which when brought in contact with another's perspective can generate emergent learning that

simply would not be possible working in isolation.

Dialogue is resonant with larger pedagogical frames within peace education, which seeks to create space in which every member of the learning collective is valued as knower and creators of knowledge (Weiler, 1988, p. 122). This can allow for a fuller and more authentic range of possibilities than is generally present within contemporary education as dialogical processes assume a degree of unpredictability and loss of individual control creating instead space “where consciousness and ideology can be interrogated, where critical thinking is encouraged” (Weiler, p. 122) offering an opportunity for both students and teachers to be more fully human.

In a world where many different languages are spoken and cultural perspectives vary greatly, the patience and respect that can be amassed by engaging dialogic processes can be indispensable in working for peace in a complex world. David Bohm, Donald Factor, and Peter Garrett argue that dialogue:

is a way of exploring the roots of the many crises that face humanity today. It enables inquiry into, and understanding of, the sorts of processes that fragment and interfere with real communication between individuals, nations and even different parts of the same organization. (Bohm et al., 1991, p. 2)

In terms of complexity, dialogue allows for the emergence of a novel synthesis from these sources of energy present in a conversation, what Juanita Brown who developed the World Café conversational process calls “the meaning in the middle.”³⁰ Dialogue at its best can allow for generating shared meaning while making room for persistent difference. It seeks to multiply rather than reduce pathways for feedback and holds that shared understanding can emerge from such encounters.

³⁰ From personal conversations. World Cafe <http://www.theworldcafe.com/>

The Arts

While dialogue presents a range of learning opportunities generally it is conceived of as relating to verbal communication and therefore is limited in its forms of expression and pathways for synthesis. Not surprisingly, peace educators often seek a wider range of sites for reflection, analysis, and creative communication especially as many practitioners are working across linguistic and cultural lines of difference.³¹ As a response to these and other needs they have often used the arts to engage learners in exploring possibilities for a more peaceful and just world as well as to examine the dynamics of conflict and violence. The arts are used within peace education to look at a wide variety of issues ranging from nuclear disarmament and genocide to the influences of war on society (Bretherton et al., 2003). These forms of artistic inquiry have supported learners in creatively analyzing and expressing the full gamut of their thoughts and emotions in relation to violence as well as their visions of alternative futures. They do so in part by accessing a wider range of symbolic representations than is usually drawn on in modern education.

John Paul Lederach suggests that peacebuilding requires that we must create and sustain innovative responses to the roots of violence while also finding ways of rising above those dynamics (Lederach, 2005). He argued in his book, *The Moral Imagination*, that artistic processes can support peacebuilding efforts by strengthening ones creative orientation toward social change. He contends this is helpful as social change is a creative act and therefore requires more than knowledge, skills, and models. Celia Gerard (2003) echoes this sentiment contending that artistic processes often employ habits of mind, which are supportive of conflict resolution approaches. She highlights similarities between the *processes* of making art and conflict

31 See Peace Arts International for an example of such projects <http://www.peaceart.org/>

resolution when she writes:

The practice of making art is in some ways about conflict resolution. It is often concerned with bridging disparate concepts, both abstract and literal. Resolving tensions to form an integrated whole is central to both art making and conflict resolution. Engaging in art making helps people develop this proclivity. Therefore, studying artistic processes can inform conflict resolution theories. (Gerard, 2003, p.10)

Marshall McLuhan's phrase "the medium is the message" (1964) offers insight into the inseparability of process, statement, and outcome embedded in artistic discourse and practice, a point which is often overlooked within modernist educational approaches which privilege outcomes. The arts often challenge the status quo in education, as many forms of art do not assume a preconceived knowable outcome outside of the artistic process. Experimental art requires creativity and flexibility as pre-existing ideas often shift both in relation to the mediums one is working with and in terms of engaging with ideas of other people with which one may be working. In this way, art is in keeping with life where complex and nonlinear processes cannot be understood or controlled easily and emergent possibilities must be worked with. Peace educators have used the arts to bring people together across lines of difference (Ardizzone, 2001), to promote emotional healing (Harris & Morrison 2002) and to engage learners with critical concepts in the field such as contrast, diversity, dissonance, harmony, and paradox (Gerard, 2003). While it may be possible to remain committed to core principles and vision within an artistic process the interaction between medium and intention can produce outcomes that are often difficult to predict and in this way supports learners in embracing complexity and ambiguity (Gerard, 2003).

While authors such as Gerard insightfully stress the importance and versatility of the visual arts in peace education, artistic processes used in peace education extend far beyond these forms. For example, educational theater plays a central role in many peace education settings. It

is widely recognized as a powerful form of team or community building (Fisher, 1987; Kidd, 1984) and it provides well-developed body of work for affirming personal and collective stories and exploring identity and meaning in education. In the context of peace education theater often provides a creative medium through which to explore the voices of people or groups that have been marginalized or silenced. Therefore, it has been used in communities around the world to communicate the long history of courageous peacemakers and the countless struggles for social justice (Boal, 1985; Kidd, 1984; Zinn, 2003). It can serve as a tool for making the historical relevant and for examining contemporary life from various sociological perspectives.

Theater also offers those involved in conflicts, opportunities to tell their personal stories or the stories of others in an embodied way. This truth telling and the positive visualization of alternative futures can be a healing experience and it is well documented (Chapman et al., 2001; Leveton, 2010) that both art and theater have been successful forms of therapy for dealing with traumatic stress from violence.³² The process of acting is knowledge yielding as it can engender a deep sense of empathy as the actors need get into the hearts and minds of the characters being played. Theater also simultaneously engenders empathetic feelings from the audience in a way that few other mediums can do as it reenacts the intimacy of social life. As a result, theater often evokes a visceral response in those who witness a play as well as from those who are acting in it.

Interestingly, theater provides a creative window through which to explore the living dynamics of social relationships by experiments with the relationship between the themes being engaged with and the audience. Here Augusto Boal's work in *Theater of the Oppressed* (1985) is illuminating. In *Theater of the Oppressed*, the goal is to provide an opportunity, an avenue through which 'everyday' people can change from spectators (largely passive observers of their

³² For additional data about the healing effects of art therapy visit:
http://www.arttherapy.org/art_therapy_in_the_news.htm

situation) into the protagonist of their own life stories. The play then becomes an exercise in telling a story that is real for an individual or the community and then rehearsing alternative ways of engaging with the elements that the community members are struggling to change. As the community rehearses together, exploring various pathways of challenging oppression they experiment with strategies for shifting those dynamics as they manifest in various aspects of their everyday lives (Boal, 2000, p. 165).

Theater is a versatile pedagogical tool as it helps emboldened communication and deeper reflection on group processes. There is a long cross-cultural intellectual tradition maintaining, “social action is (literally) dramatic” (Duncan, 1985). If ‘all life is a stage,’ then our roles as actors that can effect changes within narratives, which are oppressive or inspiring, is of tantamount importance from a peace education point of view. Theater is supportive of peace education efforts through which learners are encouraged critically to examine their lives and the group processes they are a part of and consider if they are being influenced by arbitrary decisions taken by an unresponsive leadership or from more participatory and democratic processes. Libratory theater seeks to hone such critical perspectives by offering parties a very clear set of processes through which to practice and affect the plot construction of their worlds. In the words of Boal, participants “rehearse for revolution,” (2000, p. 155) practicing ways to interrupt, disturb and transform the scenes that so often invisibly play out in the everyday theater of life.

Educators like Gerard and Lederach make the connection between peace education and theater clear as they contend that working for peace can be seen as an artistic endeavor at its core as building a nonviolent world and transforming violence are often creative processes. Artist peacemakers highlight this point, adding that so long as the search for truth and beauty are marginalized by glorified representations of violence and competition humans may have little

chance of consciously transforming their relationships and moving toward more nonviolent ways of living. As a result, both theater and the arts are used by peace educators to cultivate a creative sense of agency in the face of such violence in the hopes that learners will critically engage and transform such dynamics.

Critical Pedagogy

Critical pedagogy (Darder, 2009) is also at the core of many peace education efforts and like dialogue and the arts often seeks to support learners in a more complex understanding of agency. Critical pedagogical influences on the field are vast but none more substantial than the influence of feminist writers (Brock-Utne, 1986; Reardon, 1988; Reardon, 1993) who since the 1970's have developed a substantial interdisciplinary body of work on critical pedagogy. Nancy Fraser and Linda Nicholson argue that critical pedagogy offers us “an opportunity to develop more complex inquiries into the relationship between identity, subjectivity, subject position and political agency” by opening up a world of possibilities far more complex than exist within hegemonic discursive parameters (Parton, 1996). They argue this can be done effectively by working “to examine structures, ideologies, and practices that have existed and continue without analysis or disruption over long periods of time” (Denith, 2004).

Critical pedagogy attempts to deconstruct discourses and reveal subtle layers of meaning—those aspects of culture, the symbolic sphere of our existence, “exemplified by religion and ideology, language and art, popular media, and the empirical sciences” (Roach, 1993). A critical approach is central to cultural literacy, something that is not only valuable to peace educators on a theoretical level but is intensely practical as it may reveal how culturally situated knowledge and meaning can be used to justify or legitimize direct or structural violence. In other words, critical education in peace education seeks to expose the cultural lenses through which one sees, lenses that can ‘blind’ one from recognizing harm done to ‘others’ as being

violent at all. This educational approach stresses the importance of the applicability of methods of critical inquiry to many spheres of inquiry; it is an orientation resistant to dominant narratives.

From the critical perspective ideas are not to be accepted automatically, on the contrary, in this view, everything is contestable. When reading or discussing a topic or text the critical pedagogical orientation encourages a multiplicity of readings and levels of analysis. This is done “by demonstrating how we cannot exhaust the meaning of the text, how a text can participate in multiple meanings without being reduced to any one, and how our different personalities affect our reading of it” (Chow et al., 2003, p. 271). When looking at a specific text or source, questions arise that are helpful to inform a critical perspective, such as “Why am I reading this text? What kind of act was the writing of it? What am I participating in when I read it?” (Lather, 1991).

This form of educational process can result in “unsettling received definitions, multiplying subject positions, and unlearning our own privileges” (Lather, 1991, p. 124). Though this may sound like an ungrounded or disturbing process for learners it also can empower personal perspectives and allow one to understand more deeply the location of one’s own position within society. The reduction of teacher-student authority relations in peace education has taken much from these critical feminist classroom practices. These practices in all are meant to make room for “less directive teaching techniques, circular class seating, small group discussion, students seen as experts, shared leadership, and collective decision-making about course content and grading” (Manicom, 1992, p. 380).

Peace educators with a critical disposition may work to “abandon crusading rhetoric and begin to think outside a framework which sees the ‘other’ as the problem for which they are the solution is to shift the role of critical intellectuals from universalizing spokespersons to cultural

workers who do what they can to lift the barriers which prevent people from speaking for themselves” (Lather, 1991, p. 146). Here critical perspectives provide a check on more liberatory orientations arguing that peace educators who wish to liberate may accomplish the opposite, as their zeal to influence the other becomes its own form of a technology of surveillance and normalization (Lather).

The task of the critical peace educator is to construct “classroom relations that engender fresh confrontation with value and meaning” and to be concerned with situations where “authoritarian talk shuts down communication” even if such talk is done in the name of liberation or peace. To challenge of such unequal distribution of power in the classroom is to ask: Who speaks? For what reason and to whom? Who listens? Who is confident and comfortable and who isn’t?” (Lather, 1991).

This critical approach extends far beyond textual analysis and has incorporated various forms dialogue, arts, and theater. In her work using theater, Kathleen Gallagher explains, “Educational drama asks students to commit to possibilities and its use of collaborative structures invites competing elements and frames of reference” (Dentith, 2004). These competing frames can exist simultaneously in a critical pedagogical space. For example, Dentith used photography in particular as a way of looking at issues from a different angle while asking difficult questions about the way she and her students saw the world and chose to represent it. She explained the advantage of this medium for critical inquiry of social dynamics maintaining picture-taking, helped us to make the “familiar strange among us” (Dentith, p. 468). Peace educators have used critical practices around the world to make the ‘familiarity’ of violence and oppression ‘strange’ thereby opening up spaces for alternative ways of seeing and being in the world.

Peace education pedagogy, while diverse, tends to be experiential, collaborative and engaged and challenges popular misunderstandings about creating and embodying peace—that it is a passive practice, a withdrawal from or avoidance of difficult circumstances. If peace is understood through this lens, the process of education becomes one in which students are motivated and engaged and encouraged to interact, communicate and critically and creatively reflect on themselves and their environment. As reviewed in this section, there are many educational methods for teaching about and for peace and these diverse approaches seek to link the values of peace education to the processes that sustain the learning community and allow it to engage with the ever-changing contexts in which it is embedded.

Concluding Thoughts

I have made the case that in the search for education, which is vital, alive, and relevant, growing numbers of educators have sought to engage within an increasingly complex web of challenges and opportunities. For decades, peace educators have dedicated themselves to this mission amassing a wide range of responses to the complexities of both local and global challenges. When examined from a bird's eye view peace educators have created a methodologically diverse body of work, which provides a rich array of potential resources for educators interested in engaging with complexity.

This is significant as peace education often is marginalized within mainstream education and offers rich examples of praxis for responding to global complexity. In this chapter, these eclectic pedagogical approaches and thematic areas were examined, thus providing a window into the values, content and educational processes that animate this expansive international field. Moreover, these efforts by peace educators suggest multiple orientations for engagement with global complexity and therefore make a vital contribution when considering strategies for a

complexity approach to education that is relevant and engaged.

From the perspective of content, peace education is a broadly interdisciplinary field that covers topics ranging from nonviolent social movements and environmental justice to conflict resolution and disarmament. The overview of peace education content presented in this chapter drew attention to the scope of creative responses put forward by peace educators and the far-reaching concerns they face in attempting to engage with and adapt to complexity through curricular means. The many subfields that make up peace education each contain a vast array of theoretical approaches and thematic possibilities and decades of curriculum development. Inevitably, there are also disagreements, contradictions, and conversations within and between each of these fields as well as with academics and practitioners who are interested in generating overarching frameworks that tie them all together. These struggles are partly a function of the diverse needs of peace educators and the far-reaching spectrum of viewpoints this global learning community holds. I have argued here that this reality of shared as well as variant values and approaches contributes to the strength of this field which is resistant to unifying frameworks and which seeks to be adaptive in its responses to global complexity.

A complexity theory lens suggests that such struggles for making sense of complex phenomena also point toward ontological shortcomings in peace education praxis as global complexity poses serious challenges to disciplinary inquiry. This is the case as interdisciplinary approaches are often fragmented and lack the conceptual clarity to make sense of emergent and profoundly interrelated phenomena that cross such disciplinary divides. The problem is that global complexity simply will not fully conform to the thematic boundaries educators conceive of, no matter how comprehensive they may be. Peace education therefore struggles to find the analytical resources for engaging within such complexity as the hybridity and synergy that exists

in the world often cannot be captured by the fixed categories often put forward within the field.

While the field of peace education offers a dynamic and far reaching approaches to content this chapter suggests that this thematic terrain provides only a partial view of the fields attempts to engage complexity as educators have also developed an eclectic array of pedagogical approaches that are worthy of analysis. These pedagogical practices include but are not limited to progressive, liberatory, critical and creative approaches. Those methodologies were reviewed in this chapter in light of the view that they have emerged specifically as a creative response to both the diversity/complexity/messiness that these educators have experienced and as an alternative to the oppressive power dynamics of traditional pedagogy.

In this chapter several pedagogical approaches were featured and dialogue was highlighted as a pedagogical process that served peace educators in their efforts to unlock a greater complexity of viewpoints and to promote the cross fertilization of perspectives within educational processes. Peace educators who use dialogue contend that it fits particularly well within a peace education frame as it encourages the development of creative processes for having challenging conversations. Like dialogue, the arts and theater also provide a more diverse array of pedagogical pathways for expression and engagement as they incorporate multiple modes for communication, creation, and reflection. The arts were featured as they often shift 'the conversation' by bring participants into contact with a host of mediums as well as opening the door to embodied practices that challenge learners to express and learn in more complex ways.

It is this point of making space for multiple perspectives on which critical pedagogues have focused (Dentith, 2004; Lather 1991). Critical pedagogy contributes to the diversity of the field of peace education by resisting overly unified interpretations of reality emphasizing instead the importance of the need for spaces and processes to challenge dominance and access the

unique perspectives that people hold. Critical pedagogy therefore plays a vital role in challenging unquestioned frames by creating pathways for marginalized voices to be heard and continually searching for diversity of perspective in learning environments.

From a complexity point of view, these varied pedagogical approaches may contribute to the strength and fluidity of the field of peace education, as educators are not bound to expectations of methodological singularity. Yet while these pedagogical styles share common values and are often used as part of a more comprehensive approach to education there are also substantial areas of potential contention between them. For example, critical pedagogical contributions include a serious challenge to empirical claims made by educators such as Gadamer who try to make a case for the 'objective rightness' of viewpoints. This chapter also contended that critical pedagogues raise substantial concerns about unexamined libratory frameworks. They argue that such frameworks can serve as oppressive regimes within peace education by presenting yet another set of values and a discourse that can be imposed on learners without consideration of their actual situated knowledge.

Complexity theory would suggest the acknowledgement that these persistent differences are inherent in the work and can be catalysts for positive change as they provide perturbation, which often contributes to releasing vital energy that promotes growth within adaptive systems. As this chapter examined, this potential for growth and disturbance is reinforced further by the commitment of educators in some quarters of peace education to resisting narratives, which seek pedagogical perfection or suggest that pedagogy can ever reach a final unified resting place. Rather pedagogical discourse within such a framework of constant perturbation then can be understood as constructed, vulnerable to change, contentious and potentially adaptive to its environment. The co-habitation of very different pedagogical forms within the field of peace

education suggests a resonance with complex inspired approaches insofar as they step away from the commitment for consistency and control popular within modernist approaches moving instead toward continual discordance, synthesis, novelty, and adaptation in pedagogically responding to the demand of global complexity.

Peace education then provides a unique educational contribution by offering a methodologically diverse body of practice from which to engage with complexity. Furthermore, the differences in normative orientation within the field provide a spectrum of situated values from which to respond to complexity while keeping the contentious issues of power, justice, sustainability, and peace at the forefront of educational endeavors. Peace educators then offer a robust body of work to examine from a complexity theory inspired approach as they are situated uniquely in terms of the richness of pedagogical resources and thematic threads they can draw on in response to the emergent opportunities that are present in a given moment. The complex potential of this amalgamated approach has emerged in part due to peace educators' break from the modernist need for pedagogical uniformity, as peace educators have instead existed at the margins of the field of education and to responsive to a wide array of contexts to survive. The field of peace education therefore serves a vital function as it both highlights the extent of the demands of global complexity and points the way toward what is possible in terms of methodologically complex responses to these educational challenges 'on the ground.'

While peace education seems at times to be pedagogically congruent with the ontological insights of complexity theory thus far it has been examined rarely from within a complexity theory framework. This raises a number of important questions: Is peace education with all its complexity synonymous with a complexity theory approach to education? If not, what emerges from peace education that we might identify as a pedagogical contribution to complexity practice

(and vice versa)? Further, in what ways are practitioners acting (or not) on epistemological and ontological insights that are in keeping with or divergent from complexity theory?

The remainder of this thesis explores these questions further, analyzing the responses of peace educators to global complexity through the lens of complexity theory. The next chapter begins to apply the sensitizing concepts of complexity theory to two of the most influential ‘alternative’ educators in the past century, Maria Montessori and Rudolf Steiner. Both Montessori and Steiner have influenced the field of peace education and they offer an initial opportunity to examine praxis that is grounded in and that arose from alternative epistemological and ontological orientations. The next chapter therefore begins to evaluate the challenges and opportunities of translating such views into practice from a complexity point of view, bringing to the fore some of the conceptual frontiers that emerge when seeking to understand the relationship between theory and practice from a complexity view.

Chapter 4: Examining Alternative Praxis through a Complexity Lens

Introduction

The last chapter offered an overview of the field of peace education and highlighted the range of contributions made by peace educators who have creatively responded to the challenges of global complexity. Peace education, much like the complexity and education literature includes a critique of contemporary educational frameworks and has resulted in a complex array of alternative approaches.

While peace education includes one of the most robust and varied responses to global complexity, peace educators continue to struggle to adapt effectively to the dynamic and interconnected world in which they live and work. As a result, many peace educators continually seek new theoretical frameworks and communities of practice to inform their work.

This section broadens the previous chapter's exploration of educational praxis that is responsive to global complexity by bringing a complexity lens to bear on the work of two highly influential alternative/peace educators³³: Maria Montessori (1870–1952) and Rudolf Steiner (1865–1925). Both Montessori (1897) and Steiner (1919) developed educational systems that have spawned communities of practice around the world that are committed to generating praxis that offers an alternative to some of the limits of mechanistic approaches.

In considering how Steiner and Montessori's work can build on the analytical resources of complexity theory this chapter engages with several basic questions that emerge at the nexus of complexity theory and peace/alternative education. These questions include: Can the analytical and metaphorical resources of complexity enrich alternative/peace education? How

³³ I use the term alternative/peace educator here to indicate that while Montessori and Steiner are often claimed within the field of peace education, they also are considered on their own as a distinctive form of alternative educational praxis.

can the theoretical and applied contributions of alternative/peace educators support new approaches or ways of thinking about education that are congruous with the insights of complexity theory? Finally, how might these insights support educators and learners in responding to the demands of global complexity?

The analysis put forward in this chapter serves as a starting point from which to explore the analytical framework of complexity applied to educational approaches, which explicitly offer an alternative to the paradigm of utility and efficiency popular in mainstream education. It examines if these alternative pedagogical practices, which have developed over the past century and have been implemented globally are congruous with some of the insights from complexity theory. This chapter analyzes how the strengths of these methodologies can be built upon and it explores ways that these methods may be further developed from a complexity theory lens. Finally, it offers a preliminary examination, which will be explored further in the data chapters (ch 6, 7) of the challenges and opportunities that emerge when applying insights drawn from complexity theory to understand and support adaptive pedagogy and curricular content that can tackle global complexity.

Montessori

“In order to educate, it is essential to know those who are to be educated” (Hainstock, 1997, p. preface).

Maria Montessori dedicated much of her life to the observation of children and to learning about child psychology and development. Montessori, a doctor by profession, became interested in the work of Jean Itard and Edouard Seguin both of whom deeply influenced her exploration of education (Hainstock). Itard, a physician himself, worked with deaf and mute children and believed “observation was just as important in education as in treatment of the sick” (Hainstock, p. 10) as it allowed one to identify pedagogical approaches that were more

responsive to the holistic needs of children. He also contended, “the mind developed through the action of the senses” (Hainstock, p. 10) and both views deeply affected the development of the Montessori Method.

Seguin agreed with Itard, insofar as he emphasized the primacy of multi-sensory learning (Hainstock, 1997, p. 10). Seguin’s perspective was influenced by the work of philosopher Jean-Jacques Rousseau who also elevated the importance of the individual will within learning processes and the need for applied activities for learning. These ideas of the importance of instructor observation of learners, kinesthetic and sensory learning, and the need to support the will of individuals left a deep impression on Montessori and she later drew on these insights in the development of her method.

In 1900, Montessori finally got her chance to put her emerging educational ideas into practice as she began to work in a residential context with children who were developmentally disabled. She observed the tenacity of these young people’s innate desire to learn and believed it was essential to design an alternative educational space that was more conducive to allowing those desires to be expressed. She wanted to support the individual initiative of these young people and to provide ample opportunities for learning through engaged tactile activities and multi-sensory experience. Later Montessori had an opportunity to develop her method further when she established the first *Casa dei Bambini* (Children’s house or household) in Rome in 1907. She eventually became convinced that the methods she developed there could also be of assistance to children who did not have developmental disabilities.

In Casa Dei Bambini an emphasis was placed on ‘self-determination’ and ‘self-realization’ and materials were provided that were specifically designed to “arouse such an interest that it engaged the child’s whole personality” (Montessori, 1995, p. 206). The majority

of the materials she used engaged multiple senses, often emphasizing increasing proficiency in terms of manual dexterity, and movement within the learning environment. These materials did not all require work at desks, as she set up multiple work areas each with different learning resources and types of engagement. The Montessori classroom was designed so that students could satisfy their own desire to learn by moving through workstations with minimal interference from teachers. The work centers were stocked with unique materials specifically designed to support learning at various stages of cognition and development in engaging with the curriculum.

Montessori schools were and remain noticeably different than mainstream schools as they emphasize the importance of child-driven education with a respect for concentration and uninterrupted work. Students in these settings work for much longer times without interruption than in a regular classroom, typically working for several three-hour time blocks per day. Additionally, much like Waldorf education, Montessori's method allows students of various ages to work together as her model involves three-year cycles. For example, children between the ages of three to five year remain with the same Montessori teacher for three-year's time (Harris, 2008).

Montessori's commitment to child-centered learning was fierce, and she placed emphasis on cultivating the internal initiative of learners rather than on teacher-driven curricula. She clearly emphasized this point writing:

If an educational act is to be efficacious, it will be only that one which tends to help toward the complete unfolding of life. To be helpful it is necessary rigorously to avoid the arrest of spontaneous movements and the imposition of arbitrary tasks. (Montessori, 1995, p. 315)

Montessori was ahead of her times in some of the ways that she radically rethought the role of teacher. She sought to shift the power dynamic that frequently existed in classrooms and she commented on the ideal role of the educator in these terms, "we teachers can only help the work

going on, as servants wait upon a master” (Montessori, 1995, p. 9).

As Montessori believed that education should be child-centered she designed materials and spaces with children in mind creating child-sized furniture and materials and constantly reminding educators to allow children to be inner-directed and to work at their own pace. ‘Directors’ as Montessori renamed her teachers were advised to primarily observe and support the inner compulsion of children to learn and to engage with the materials each of which presented opportunities that challenged children to grow. Directors then were understood as the ‘keepers’ of the space and as supporters of children’s engagement with pedagogical opportunities.

Montessori was inspired by the importance of a prepared environment where every item supported learning. This thereby could allow directors to play a more supportive role. Davis Hutchinson (2004) goes so far as to contend that Montessori’s approach is “the most explicit example of the intersection of philosophy and place ...in education” (Hutchison, p. 80). By all accounts, Montessori worked tirelessly to design an educational environment that maximized self-initiated learning and she “aroused great interest in architects, artists and psychologists” (Montessori, 1995, p. 222).

The development of the educative space that she would eventually settle on was the result of trial and error and many iterations. She and her team observed children in their interactions with various proposed materials and they worked collectively to design a space based on what they saw as an environment, which engaged the complex potentiality of the whole child. The result was the development of the Montessori classroom, a model that is still used around the world today.

Montessori on the Edge of Chaos

“If education is always to be conceived along the same antiquated lines of a mere transmission of knowledge, there is little to be hoped from it in the bettering of man’s future. For what is the use of transmitting knowledge if the individual’s total development lags behind?”

(Montessori, 1995).

While complexity theory did not exist when Montessori was alive, there is much in her approach that is relevant to complexity educators now. Montessori had a more complex lens in terms of her understanding of the processes and ways in which a child could learn (pedagogy) than do many modern educational practitioners. She believed in educating the ‘whole’ child and her style of education spoke to the need to educate for multiple intelligences.³⁴ In this way, Montessori echoed those complexity educators whom argue that modern education falls short of nourishing the diverse range of human intelligences and the many complex ways that people come to know the world (Capra, 2004; Doll et al., 2005).

Montessori intended to design classroom spaces and processes that could educate the whole child by offering an array of potential activities and a host of materials that required various levels of cognition with which to engage. Similar to complexity educators, Montessori privileged an environment that presented a diversity of potential pathways for engagement and that more aptly mirrored the complexity of the world outside the classroom. She stressed that it was of the utmost importance that the child initiate and navigate that complexity. The teacher was not then simply to throw complexity at students but to support their engagement with a complex range of potential learning opportunities and their sense of freedom and responsibility (Lillard, 1996). Gerald Gutek explains that Montessori encouraged “the individual child to

34 The Idea of Multiple Intelligences was first codified by Dr Howard Gardner. See (Gardner & Hatch, 1989).

follow his or her interests by working with a variety of graded didactic materials at his or her own pace. Since the child was free to select the material upon which to work, the child could pursue personal interests and proceed from one level of complexity to a higher one” (Gutek, 2004, p. 49). In this way, Montessori contended that education could challenge young people without being coercive and as result could become more deeply transformative. Montessori’s call for benefits of participatory approaches to education is echoed widely in the complexity and education literature.

The Montessori classroom therefore also provides an interesting view of education on the edge of chaos as it offers a well-developed example of alternative structures and approaches for engaging with a precarious balance between order and chaos in the classroom environment. Some astute observers have referred to the Montessori Method as a form of “organized chaos” (Goetz, 2001, p. 3). Traditional Montessori classrooms are in fact highly organized which may come as a surprise to contemporary educators who tend to think of education that makes space for the chaotic and moves away from teacher centered authority as synonymous with completely lacking intentionality, purpose, or design. Rather, Montessori educated on the edge of chaos as she attempted to create structures that allowed for both structure and unpredictability.

Her structure was clear in that the classroom had specific materials, furniture, and readings and she was highly organized as she conceived of her classroom as a space in which according the proverb there is a place for everything and everything in its place. It is precisely because the Montessori classroom is highly organized, and the materials intentionally designed to engage students at various levels of learning that students are able to explore the materials on their own terms and at their own pace. Learners can move about the room freely (while being encouraged to be considerate of others) and define the way in which they engage with materials.

For teachers not familiar with this style of education this approach can feel quite chaotic as it undermines traditional teacher centered authority and their degree of control in controlling pedagogical processes.

Montessori moves toward the edge by implementing an alternative to traditional teacher centered authority and contemporary classrooms structure where the teacher holds, distributes and defines the relationship with learning materials. Yet much like traditional classrooms, the environment is highly structured although structured differently. The difference lies both in the materials and in the ways in which people interact with them and each other. Such interactions decentralize epistemic authority and thereby create the potential for greater individual initiative and self-organization in the Montessori setting. Teachers are trained in the Montessori process to be an ally to the emergent potentiality of those spaces on the edge instead of the primary drivers of the process.

For complexity researchers the differences between the quality and types of relationships, which emerge within Montessori education, when compared with approaches that are more traditional is a potentially rich area for future analysis. Complexity researchers are advantageously positioned to raise questions about Montessori education. For example, how does the Montessori structure enable/inhibit emergent pedagogical processes and learning to take place? What types of intelligences are nourished within this organized chaos? Finally, in terms of the central concerns of this work, how might these learners engage differently with global complexity because of their experiences learning in this type of setting?

These questions call for a comprehensive analysis of the kinds of systems that arise within the Montessori school and for the linkages between these systems and the communities of which they are a part. It is important to note then that while Montessori focused on the

importance of the role of individual agency within the classroom, she did not conceive of learning and intelligence in purely individualistic terms. The educative environment from her perspective could be understood as not only the physical space but also in complexity terms as a system effect that results from all the people involved and the synergy, quality and intensity of the relationships between them and their surroundings.

While Montessori deeply emphasized the importance of cultivating personal initiative in the classroom, she also understood that learning was in part of function of the quality of relationships and that learning is an emergent phenomenon that has everything to do with the quality of interaction. She expressed her realization about these intangibles of education that make learning possible in terms of ‘character education.’ She explains, “education of character is considered equally with academic education, including children learning to take care of themselves, their environment, each other - cooking, cleaning, building, gardening, moving gracefully, speaking politely, being considerate and helpful, doing social work in the community, etc.”³⁵

This dimension of Montessori education is significant for complexity educators who are interested in examining the role of non-traditional educative environments in supporting compassionate and intelligent engagement with complexity. Montessori’s sentiment about character education hints at her ideas about the importance of education, which extends outside of the classroom and engages in service learning. Montessori schools encourage students to learn out in ‘nature’ and in the local community in hopes of fostering an embodied sense of empathetic understanding. These interactions were important to Montessori’s vision of nurturing the whole child as she saw them as viable approaches through which to build a compassionate and engaged

35 <http://www.montessori.edu/FAQ.html#QUESTIONS>

sense of identity. This leaning toward engagement across various spaces inside and outside of the school opens the door to further methodological dynamism in engaging with complexity in the Montessori system and can shift praxis over time.

Educational researcher Maren Schmidt explains that such approaches are not on the periphery of this methodology as, “outdoor education is a vital component of Montessori education,” and many schools “strive to have a fluid boundary between the outdoors and the indoors” (Schmidt, 2009, p. 237). While this seamlessness is difficult to achieve in practice, many contemporary Montessori educators have looked to develop Montessori’s ideas about learning outside of the classroom further. As Schmidt noted, this more complex methodological approach is an ideal toward which many Montessori educators strive and both outdoor and community education are frontiers that continue to be sources of innovation for Montessori educators (Schmidt).

A complexity view aligns with this orientation as it also emphasizes the importance of engendering a sense of fluidity between the classroom and ‘natural’ and community spaces (Capra, 1999) and it offers a host of metaphorical and conceptual resources from which to explore their interconnectivity. For example, the concepts of nestedness, co-evolution, feedback loops, interconnectivity and porosity may challenge the degree to which the ‘outdoors and indoors’ can be conceived of separately and can further nuance thinking about the ways in which they mutually co-create and influence each other. This is substantial for Montessori educators as pedagogical strategies for supporting connections between learning in the classroom and learners experiences outside of those space is still underdeveloped in the literature at this time.

For Montessori educators interested in innovation from a complexity perspective the following questions may help inform their praxis. How can the maximum amount of learning be

achieved with the minimum amount of educational structure? How does the Montessori approach of minimum intervention function outside of the classroom where the surroundings are not as predictable or easy to control? Can/should educators and learners maintain a perspective where everything is educative when it has not been designed intentionally as such (as is the case inside of the Montessori classroom)?

In all, Montessori education provides a well-developed alternative epistemology and praxis that reveals approaches for engaging with complexity. While limited in terms of the approaches employed, and educational spaces that are utilized it offers insight into the dynamics of educating on the edge of chaos. Montessori's method raises critical questions about the implementation of an alternative ontological orientation within varied pedagogical environments.

The Montessori Method is one of the most widely influential bodies of work within peace/alternative education and has spread globally due in part to its ability to adapt in supporting learners in effectively and compassionately navigating complexity in diverse social settings. Contemporary educators have applied their understandings of Montessori's philosophy with a lens toward flexibility and adaptability, for while Montessori emphasized the importance of these alternative spaces, she did not develop her ideas around how to navigate them as fully as she did the classroom. This section then has briefly highlighted some of the ways in which the descriptive explanatory language of complexity could therefore support the efforts of these educators in framing critical questions that assist in reading what is both possible and immanent in these alternative spaces.

Montessori was not alone in developing alternative praxis in response to the shortcomings of mass education. Rudolf Steiner, a contemporary of Montessori, also attempted to develop an educational model that could nurture a more complex array of intelligences.

Steiner's system (1919) referred generally to as Waldorf Education provides another rich body of work for exploring alternatives to reductionist practices and opportunities for grappling with education that is responsive to global complexity. The following section examines Steiner's work and Waldorf education more generally and builds on this chapters initial exploration of the potential utility of complexity theory in examining alternative praxis.

Rudolf Steiner and Waldorf Education

Waldorf education provides an alternative educational epistemology and highly developed area of praxis, which similar to the Montessori Method seeks a more 'holistic' approach to education. Waldorf is underpinned by the theoretical work of Rudolf Steiner (1861–1925), an eclectic thinker whose ideas initially had far-reaching effects in Europe and later spread worldwide.³⁶ Steiner was influenced deeply by his spiritual experiences, which animated his work, and supporters of his work contend this brought about an array of scientific, medicinal, social, educational, architectural, agricultural, and artistic renewal (Mason, 2006).

Steiner called his "science of the spirit," Anthroposophy, meaning 'wisdom of the human being.'³⁷ Fundamental to Steiner's approach to education was the idea of integrating the spiritual and physical aspects of reality and of every individual. He emphasized a materialist and metaphysical approach and developed his own cosmology and ideas of child development both of which greatly influenced the development of Waldorf education.

Waldorf education is most widely known for its student-centered approaches and use of the arts, which Steiner believed were primary for the development of young people, especially in the early years. Such practices according to Steiner began to draw out the 'whole human being'

³⁶ According to the European Council for Steiner Waldorf Education there are now roughly 1000 Steiner schools worldwide <http://www.steinerwaldorfeurope.org/>

³⁷ See <http://www.steinercollege.org/index.html>

as he understood art as an integrative methodology that allowed access to both subtle creative (spiritual) energies and to greater comprehension of material reality. He argued that artistic engagement was primary and that pre-lingual learners should start with art and later begin to “develop writing, which tends toward the intellectual” (Bowen-Wedgewood, 1961, p. 1).

Steiner was an advocate for a more complex approach to education and he critiqued the simplicity and single-mindedness of the educational approaches influenced by positivist assumptions when he said, “there are other powers in the human being which must be developed, and which cannot be addressed through the medium of visual observation” (Bowen-Wedgewood, 1961, p. 1). In developing his ideas about alternative approaches to education, he was responding to what he saw as the most pressing challenges of his day. His deepest concern and critique of contemporary education was what he saw as the removal of genuine connection between human beings that resulted from such scientific approaches to education. He was deeply troubled by what he contended was a pervasive and dangerous “antisocial behavior” in Europe prior to World War I and he contended this was in part the result of a materialist interpretation of education and human behavior that saw the transmission of knowledge in purely technical terms (Steiner, 1996, p. 23). According to Steiner, what was lost was not only a deeper sense of community and quality of connection between individuals but also a love for the process of learning itself. Mainstream approaches made knowledge and learning external to selfhood and marginalized mystery, fantasy, imagination and discovery in favor of banking methods in education (Friere, 1970). Overall, Steiner then thought that the art of education needed to nurture the full intuitive and creative capacities of learners to forge genuine and dynamic connections between all of those involved in the educational community.

Steiner contended his method could come to have a transformative influence on

mainstream education. He explained:

when people recognize how much is to be gained for the intellect from this early artistic education of the child, they will be willing to allow art its proper place in the primary school education. The arts of music, painting and sculpting will be given a proper place in the scheme of instruction. This artistic element and physical exercise will be brought into a suitable combination. (Bowen-Wedgewood, 1961, p. 2)

In his quest for more integrative education Steiner like Montessori emphasized the importance of manual dexterity and movement and the refining of the senses through woodworking, dance, painting, building, and a host of other activities within the schools. While Steiner explained that Waldorf education should educate the creative and spiritual needs of the child, which he thought differed substantially from the modernist educational project, he agreed with more mainstream approaches that education also needed to provide the learner with the skills and habits of the mind needed to work and contribute to the betterment of society.

The Waldorf approach is different from more mainstream approaches in that it explicitly seeks to create an enchanted and creative learning environment. Waldorf education includes a body of work on color theory and its effect on the educative environment (Steiner, 1996). Schools are painted with the goal of creating a beautiful and colorful space that is conducive to learning. The schools offer frequent plays and mythic tales, which seek to weave together both the ephemeral and material aspects of life. Rhythm also plays a central role in Waldorf education and students learn through movement and dance including Waldorf's own unique form of dance called Eurhythmy (Poplawski, 1998). The entire school day is organized according to these ideas of ideal rhythm and pace and there are no bells to signify the changing of classes as a more seamless day in keeping with the rhythm of nature is the goal. Waldorf schools draw heavily on arts and crafts, community-wide celebrations, and frequent engagement with nature in hopes of providing varied spaces for deep encounters (Steiner 1996b).

Waldorf education requires a specialized form of teacher training that is typically a two-year course of study and focuses on Steiner's ideas regarding human development and how those ideas can serve as a guide in educator consideration of relevant activities and approaches for each phase of the young person's life. The Waldorf approach considers individual and collective reflection key elements for success for all members of the learning community and schools build in regular times for staff dialogue on opportunities for learning, developmental insights, community challenges and a host of other issues (Rawson, 2010). Most Waldorf schools do not have a principle or headmaster and have developed their own governance processes including consensus decision making. Steiner encouraged collaborative forms for administration and wider community engagement in the running of schools and these processes still are employed in Steiner schools today.

Because of the international effect and breadth of praxis generated by Steiner schools, mainstream educators have become interested in exploring the potential for employing Steiner's methods for educational change. For example, The UK Department for Education and Skills report noted significant differences in curriculum and pedagogical approach between Waldorf/Steiner schools and mainstream schools (Woods, Ashley & Woods, 2005). They recommended that state schools could benefit from the following elements of Waldorf education: 1) early introduction and approach to modern foreign languages; 2) the combination of block (classes) and subject teaching for younger children; 3) development of speaking and listening through an emphasis on oral work; 4) the good pacing of lessons through an emphasis on rhythm; 5) the emphasis on child development guiding the curriculum and examinations; 6) the integrative approach to art and creativity; 7) the attention given to teachers' reflective activity and heightened awareness (in collective child study for example); and 8) collegial structure of

leadership and management, including collegial study” (Woods, Ashley & Woods, 2005, p. 8).

Waldorf can be of interest to complexity educators who are seeking alternatives to overly narrow forms of methodology and clear pathways for nurturing the complex ways that people come to know the world. Steiner schools have continually made these same goals explicit in their schools and they have over the last eight decades sought to promote integral forms of learning through movement, dance, the making of arts and crafts, community-wide celebrations and frequent engagement with nature. Steiner’s focus on holism and the novel system of education that he developed in his attempt to offer an alternative to modern education provides a rich pedagogical terrain from which to begin to examine education on the edge of chaos.

Steiner on the Edge of Chaos

Waldorf education presents a promising body of work from which to explore methodological responses to complexity resulting from ontological perspectives that move away from reductionist frameworks. Waldorf schools attempt to engage students in sensing what Bateson calls “the patterns that connect,” (Bateson, 1972) by nurturing understanding of systemic relationships through pedagogies that generate aesthetic, emotional, and intellectual engagement with complexity. Waldorf focuses heavily on creative approaches and the arts to engage learners actively in processes that intimately connect their ‘inner’ and ‘outer’ worlds (Ginsburg, 1982). The primacy of the use of the arts in Steiner’s vision of experiential education serves as a reminder of the potential effect that more complex pedagogical approaches can have when viewed in light of traditional approaches.

Rudolf Steiner contended that art in education allowed for an intimate relationship between subject and object, and a sense of connection in the emotional life of the child (Ginsburg, 1982). From a complexity point of view, Steiner’s approach arts integration is

significant as it diversifies pathways for generating feedback, validating emotional responses as knowledge yielding and supporting self-reflexivity and action in response to that information. Steiner's claims echo contemporary research, which contends that the arts can contribute to making education more relevant and responsive to complexity as they promote deeper engagement with the social emotional life of learners (Grumet, 2004).

Further alternative pedagogical methods that integrate the arts, like Steiner's approach, can support a move toward the edge by offering an expanded field of curricular possibilities.

Moving Toward More Holistic Curriculum

Central to Rudolf Steiner's approach was his use of pedagogy to support learners in deepening their understanding of systemic relationships (Gidley, 2002). Waldorf educators demonstrate some of these possibilities by using the arts as tools for engaging with themes in an inter-disciplinary or even transdisciplinary approaches to curriculum (Kakas, 2009).

Through artistic pedagogies learners in Steiner schools often use symbolic representation drawn from more than one academic disciplinary system, thereby engaging bodies of knowledge from multiple fields simultaneously. This is significant in terms of engaging with complexity as the dynamic nature of interconnected complex adaptive systems does not always conform to disciplinary boundaries often causing methodological problems regarding re-presentation and comprehension of complex phenomena which traverse the disciplinary frames used in mass education. (Davis and Phelps, 2004) Davis and Phelps explain, "A prominent theme across the current complexity science literatures is that the linear narrative and the Euclidean image are inadequate to depict the emergence and the behavior of a complex form. Rather, instances of complex emergence call for webbed, multithreaded tales and nested, scale independent geometries to accommodate forms that can become more intricate, more dense, more pregnant

with possibilities” (2004, p.4).

In terms of Phelps challenge to generate education that is more complex, Waldorf educators often draw on a diversified field of possibilities for engaging with/within varied environments and through various mediums. For example, learners at Waldorf schools frequently learn and create art in outdoor settings and participate in outdoor programs.³⁸ As some forms of art lend themselves to increased mobility (sketching outside, doing poetry in a community setting), Steiner schools can utilize more diverse pedagogical spaces and forms of knowledge production. In the case of Waldorf education, Steiner contended that this varied and creative methodological approach should foster connections that are more genuine between learners and the world and that artistic modalities supported learners in generating an increasingly integrative worldview. John Pellitteri’s research into the benefits of arts integration supports Steiner’s claims insofar as he concludes that aesthetic approaches involve “the integration of multiple dimensions” of knowledge, which can lead to successfully cultivating social emotional learning (Pellitteri, 2006, p. 7).

Steiner’s goal to move toward more holistic approaches that allowed the feeling life of the child to be engaged relied heavily on teachers developing developmentally appropriate strategies for understanding context within and across multiple systems. Steiner contended that his observations of human beings revealed that around the end of the ninth year an important change took place as in terms of systemic understanding in students:

(at this time) the sense of self assumes a form that awakens in the child a relationship to nature and to the world about him such that one can now talk to him more about the connections between things and processes themselves, whereas previously he was

³⁸ To see examples of Waldorf Education outdoor programs see the Taos Waldorf School in the US: http://taoscountryschool.com/index.php?option=com_content&view=article&id=19:taos-country-day-school-a-waldorf-inspired-school-in-taos&catid=1:taos-school&Itemid=2 and The Vancouver Waldorf School in Canada: http://www.vws.ca/curriculum/c_highOutdoor.html

interested almost exclusively in things and processes only in relationship to man. (Bowen-Wedgewood, 1961, p. 2)

This shift in awareness that Steiner pointed out, if true, is significant as it can allow teachers to guide learners toward focusing on systemic awareness from multiple positions within those systems for the first time.

While Steiner appeared to be confident in these findings, he also encouraged teachers to continually test and build on these conclusions as, “facts of this kind in a human being’s development ought to be most carefully observed by the educator” (Bowen-Wedgewood, 1961, p. 2). His work highlights the need for empirically ground research into student comprehension of complexity as to try to teach about systems knowledge too early would be completely ineffective. Steiner’s claims about the importance of when larger systemic relationships first can be understood by students and the gradations of that learning over time then pose a sizable challenge to complexity researchers. While these theories are central to complexity inspired praxis examples of developmental schema that engage with these questions of when children develop ontological insights about complexity are currently under-researched in the complexity and education literature. However, initial attempts have been made to examine Vygotsky’s sociogenetic theories of learning and development from a complexity theory lens (Kirshner and Kellogg, 2009) as well as Piaget’s (1991) analysis of practical operations and meaning construction in light of Maturana and Varela’s ideas (Doll, 2008).

Complexity researchers have also as of late begun to engage more deeply with child development theories (Doll 2008; Jerome Proulx, 2008; Kirshner & Kellogg, 2009) and to amass their own empirical data on development (Andrews et al., 2003; Halford et al., 2002). From a complexity point of view, this research is significant as it can inform the range of pedagogical and curricular possibilities in terms of developmentally sound strategies for engaging

complexity. Waldorf education then offers a wide array of applied strategies for engaging students in understanding and emotionally engaging within complexity. Complexity educators can learn from Steiner's approach, as there is currently a need to understand the relationship between developmental stages and the cognition of dynamic interconnectivity more deeply.

While examining child developmental is just beginning to gain momentum in the complexity and education literature, complexity researchers, and educators have amassed an eclectic array of potential pedagogical supports for engaging with global complexity. In so doing, they (like Waldorf Education) add a growing and widely interdisciplinary body of thought in relation to praxis to the existing canon of alternative approaches.³⁹ By making the language of complexity available to learners as they first come into this awareness of systemic relationships complexity theory may provide a larger conceptual palette from which to think about and respond to the burgeoning ontological insights that Steiner noted and tried to respond to in his research. On the other hand, complexities examination of the child development literature remains thin and Steiner's developmental theories that focus on grasping dynamic interconnectivity and the worldwide examples of arts integrated pedagogy that Waldorf schools have developed provide a unique opportunity for complexity educators to deepen their fledgling examinations of pedagogical strategies that engage with complexity.

Conclusions- Moving Toward Complex Educative Environments

This chapter explored the work of two influential alternative educators: Rudolf Steiner and Maria Montessori. It provided an overview of each of their philosophies and examined the alternative approaches they developed. Both Montessori and Steiner critiqued the education of their day and they responded by developing methods they believed could educate the whole

³⁹ Complicity: The International Journal of Complexity and Education offers the largest repository for these resources.

child. Their alternative approaches sought to draw out the full potential of each student by avoiding coercive pedagogies and by offering more dynamic and complex learning processes.

Montessori and Steiner provide a critical opportunity to examine an alternative pedagogy that is more in keeping with some of the insights of complexity theory. Their approaches offer opportunities from which to deepen this work's ongoing examination of the parameters/possibilities for educating on the edge of chaos and to begin to apply the sensitizing concepts of complexity theory to alternative orientations in the field. When the analytical insights of complexity theory were compared with the work of Montessori and Steiner, they provided additional momentum for rethinking the role of teachers more broadly and for considering a fuller range of opportunities for creating dynamic alternative educational processes and spaces.

Montessori's methodology was highlighted as it seeks to generate learning opportunities that are relevant to the lives of students. This is made possible in part by a classroom environment, which is both highly organized and has multiple sites that are adaptable to the various developmental levels of its learners. Montessori's materials differed from mainstream schools in that they offer various levels of difficulty in relation to manual dexterity and conceptual/thematic learning thereby offering greater pedagogical flexibility by providing a range of educative opportunities within each workspace. In the Montessori classroom students move between workstations freely and her approach seeks to emphasize the student's natural curiosity as the force that drives education.

The role of the teacher then was rethought radically in her view and the controlled chaos of the Montessori classroom drew on the inner compulsion of the child to learn with limited interference from adults. These specialized educative environments, which could engage learners

at various levels of cognition, allowed teachers to observe the learning of students and to support the child in their interests and curiosity for working with these materials. Further, as the Montessori method has developed there has been an increase in learning outside of the classroom. These alternative spaces then present a host of challenges as opportunities for Montessori educators as they open up to a fuller range of potential outcomes in spaces, which are more unpredictable than the organized chaos of the Montessori classroom. Montessori education then provided an interesting example of emergent learning made possible by this dance between classroom structure/educational spaces, adult support and the desires of the young persons to learn.

On the other hand, Steiner sought to honor both the intellectual and feeling life of the child by creating a form of spiritual education, which engaged with what he considered both the existential and metaphysical layers of reality. The arts serve as a key pedagogical tool within Waldorf schools as learners frequently make crafts, dance, and sing in engaging with the core curriculum. Waldorf also draws heavily on physical movement, mobility, and contextual diversity as learners frequently engage in education outside of classroom spaces. The methodological complexity of Steiner's weaving together of various aspects of reality through the richness of mythic tales, metaphors and a range of arts offers a substantial body of creative tools for considering integral approaches to complex curriculum that engaged with global complexity.

This chapter then also focused on Steiner's ideas about child development, especially as they pertained to developmentally appropriate engagement with complexity. Steiner offered a vision for development that suggested a time line for this scaffolding of knowledge and when certain pedagogical process could be used successfully to integrate understanding that is more

complex. These findings pose a challenge to complexity researchers in terms of highlighting the need for contemporary research and ongoing analysis of praxis in this domain.

In their efforts to build and support dynamic learning communities, Waldorf schools have also brought Steiner's alternative ontological vision to bear on their decision-making structures. Steiner schools employ more complex and collaborative approaches than are typically used within contemporary education and these less-hierarchical approaches have remained a central part of the philosophy of Steiner schools for more than a century. In all, Steiner moved toward the edge of chaos by provided a more complex understanding of the use of educational spaces and processes than is often the case within contemporary education while seeking to sensitize learners through greater inclusion of the arts.

Inspired by the examples of Montessori and Steiner, this chapter began to examine more broadly the implications of an increasingly complex and flexible methodologies within education and some of the philosophical and analytic insights that underpin such endeavors. This chapter highlighted some of the ways that these alternative systems provide resources for teaching and learning on the edge of chaos as they utilized a more complex array of environments and methodologies for generating feedback and responding to the dynamic contexts in which they were embedded. However, a complexity analytic also illuminated the places where Montessori and Steiner tend toward stagnation and may be supported in considering pathways for growth, suggesting that these alternative systems offer an incomplete exploration of the possibilities that exist in terms of education that is responsive to complexity.

Overall, the analysis in this chapter points toward the need for a radical rethink of the role of educators and what is possible in both formal and informal educational environments. It illuminates how some alternative pedagogical practices, especially those developed by

Montessori and Steiner are broadly aligned with some of the insights from complexity theory, and that these methodologies have been utilized in a wide array of settings over roughly the last one hundred years. More importantly, these well-developed bodies of work are widely recognized as having beneficial aspects in terms of providing a more holistic methodological framework for responding to the demands of complexity than mass educational frameworks often provide. The chapter then lays the groundwork for a deeper consideration of how these successes can be built upon and how these alternative methods can be augmented through insights from complexity theory to tackle global complexity as a subject of study.

In this regard, complexity's promise as an analytical tool for evaluating the mechanisms and processes that support such dynamic change in education remains in the early phases of exploration and has only rarely been brought to bear on alternative subfields of education such as peace education. This chapter then offered an initial and brief exploration for reading alternative methodological development from a complexity viewpoint. The remainder of this thesis is devoted to further developing complexity theory as an analytical lens from which to examine the work of practitioners engaging with global complexity.

Before engaging with this analysis of praxis drawn from cases from India, the US and Japan, the next chapter will make explicit the methodological approaches that underpin the examination of these examples in the field. That methodological approach was informed by complexity theory and draws heavily on ethnographic approaches, narrative inquiry, and autoethnography in exploring the challenges and opportunities of conducting research that seeks to engage with rather than minimize complex adaptive approaches to educational change.

Chapter 5: Research Methodology

Introduction

This chapter is an examination of the methodological framework guiding the research conducted for this dissertation. I seeks to clarify the ontological and epistemological journey that led to my interest in complexity theory as an analytical and methodological lens that could support educational innovation, especially international education with a social and ecological justice focus. This chapter draws from the interdisciplinary researcher in the field of complexity and educational research offering an array of sensitizing concepts and frameworks for exploring peace education from this ontological and epistemological standpoint. It builds on the critique put forward in previous chapters of reductionist and mechanistic approaches and illuminates the layered qualitative and reflexive methods I used to analyze the emergent practices of educators that were responding to global complexity in India, Japan and the US.

In this chapter, I seeks to unpack, in broad terms, the implications of complexity theory for educational research highlighting the ontological and epistemological insights put forward by Deborah Osberg et al. (2008), Tamsin Haggis (2008), James Horn (2008) and Mike Radford (2008) among others. In doing so, it provides a window into a complexity perspective on educational research and its critique of dominant research paradigms in the field. Mike Radford summarized the scope of this challenge well when he wrote:

Dominant ontologies and epistemologies struggle with the conceptualization and representation of particularity, difference, process, interactions through time, multiple and de-centered forms of causations, and dynamic structure. (Morrison, 2008, p. 3)

Complexity theory highlights the need for an exploration of the epistemological and methodological considerations that such ontologies demand. As I will explore later in the chapter, complexity theorists interested in educational research such as Tamsin Haggis (1998)

and Brian Goodwin (1994) argued for the use of diverse research methodologies to engage with complexity. In searching for these complex methodological approaches, I examined an array of literature grounded in the qualitative and reflective methodology literature (Atkinson, 2007; Borden, 2009; Chase, 2005; Denzin & Lincoln, 1997; Dyson & Polkinghorne, 1997; Kelly & Lesh, 2000).

While some complexity researchers like Haggis pointed out the limitations of these qualitative research practices (2008), the utility of these practices for explaining the complexity of social life by making room for subjectivity, multiple standpoints and the complex dynamics of co-constructed meaning is widely supported (Denzin & Lincoln, 2000; Goodwin, 1994). In an effort to search for a suitable methodology to elucidate global educator narratives in response to the complexity they faced, I chose to employ a mix of autoethnography, ethnography and narrative inquiry approaches for collecting and analyzing data. As Michael Dyson (2007) and other researchers (Bochner, 2000; Denzin & Lincoln, 2000; Tierney & Lincoln, 1997) point out, the intersection of narrative inquiry, reflective ethnographic field research, and autoethnography allows for the exploration of complexity by examining the rich subjective interdependence between the researcher, researched and the complex socio-cultural contexts within which they are embedded.

Given that I was conducting field research, in India, Japan and the US, those methodological frameworks served the demands of this international research project as they showed promise in terms of accounting for the diverse cultural, political, and spatial locales that I traversed. This layered approach assisted in examining the effects of those experiences on my thinking while also providing a framework for analyzing the diverse contexts in which the educators I interviewed made meaning of their work in relation to global complexity. As a result,

this chapter unpacks the critical conceptual and methodological insights and struggles that took place as a prelude to and during this research, all of which influenced the direction of this project and my approach toward ‘collecting’ and describing the ‘data’ featured in the following two chapters.

Methodology that Engages with Ontological Complexity:

The historical account of the rise of mass education in Europe presented in chapter two highlighted the influence of industrial capitalism and the effects of the state’s concern for quelling social unrest and producing ‘obedient citizens’ on shaping educational structures. At that time, reductionist practices and thinking served to not only meet the demands of simplifying knowledge and bringing easily replicable educational models to the masses but for examining the effectiveness of those systems. Complexity theory however reframes the purpose of education in terms of supporting learners in analyzing and engaging with complexity and seeks to employ complex methodologies for assessing the field of possibilities in education.

Complexity theorists working on educational research argue that popular methodological approaches to educational research are often flawed. Horn (2008) noted that while post-structuralist critiques have taken issues with positivist epistemologies for some time, “this has not held back the renewed entrenchment of more narrow definitions by policy elites of what constitutes scientific educational research” (Horn, p. 130). Complexity theory challenges these inspection regimes, which are popular with policymakers and educational administrators throughout the world by epistemologically undermining the practicality of such attempts to uncover simple levers for manipulating educational change and influencing performance goals.

Radford (2008) highlights the shortcomings of positivist epistemological orientations in educational research when he writes:

there is an assumption that a school can be objectively observed with a range of

observational categories, and that virtually every aspect of educational provision can be reduced to the basic units of observational evidence, much of which can be articulated in terms of numerical values. (Radford, 2008, p. 145)

Those numeric values are used to depict a simple and linear snapshot of the school environment in an attempt usually to highlight areas of weaknesses, which can be re-tooled for greater efficiency in ongoing efforts at school 'reform.' This social technological view assumes a high degree of control through reductionist practices, which are meant to reveal simple causal dynamics, which can then be manipulated in formal educational settings to achieve predictable outcomes. Given this context, educational research is often meant to serve these ends.

Complexity thinkers argue this is problematic as educational settings are complex and dynamic environments that "have been treated as closed (self-contained) systems, rather than the permeable, dissipative open systems they would be if allowed" (Radford, 2008, p. 135).

Complexity theory, with its emphasis on non-linear dynamics within multiple open systems radically challenges such epistemological views and undermines the control assumed within such approaches (Radford). It instead paints an ontological picture depicting the school environment as complex, where multiple dynamic variables create effects that are emergent and cannot be understood if reduced to their individual parts and pieces. Instead, the patterns of relationships across multiple scales and their quality, intensity, history, and context matters for complexity thinkers in terms of understanding the potential for change within such systems.

Haggis explains the implications of such claims, writing, "causality in this situation cannot be reduced to a single or limited number of factors, as the factors are all crucially implicated in relation to each other" (Radford, p. 167). He supports Byrne (2005) in suggesting "the impossibility of tracking these multiple interacting histories suggests a shift from a focus on cause to a focus on effects" (Radford, p. 167).

This is not to say that reductionist practices are not effective for understanding sufficiently stable and simple processes in education, in fact many complexity thinkers argue they are. Radford builds on Karl Popper's argument, which makes a case for the simultaneous existence of both determinate and unpredictable processes when he writes:

Everything in the universe might be viewed on a continuum between, on the one hand, determinate, reducible and therefore relatively predictable and closed systems, such as clocks, and on the other, indeterminate, unpredictable and open systems such as clouds. Everything, however, at every point on the continuum, even clouds, might be understood in terms of 'clockishness'...on the other hand everything might contain a degree of 'cloudishness.' (Radford, 2008, p. 151)

Radford's view raises an important question: are educational processes more like clocks or clouds? The answer to that question clarifies one's ontological position and informs what research methodologies are most useful in the field of education. If educational processes and structures exist on the continuum suggested in the quote above then this implies that a range of methodological approaches is needed in educational research. However, while research methodologies that can better grasp complexity are needed they are far-less well developed than those that seek to understand that which is perceived to be reducible and predictable. That is to say, that our ability to understand that which is complicated is more advanced than our methods for examining the complex. Thus, complexity-inspired methodology strives to expand the epistemological and ontological field of possibilities for understanding the complex adaptive nature of educational processes and to foreground the limitations of reductionist practices. This orientation toward educational methodology is not just a pragmatic question but a normative one, as it asks not only the ontological question; does education tend to be complex and adaptive but also the value question; which should it be?

Complexity offers a robust and compelling ontological counter-narrative to reductionist approaches arguing "the combination of multi-factor causality, occurring throughout time, in the

absence of a central, generative force, results in quite a radical notion of emergence and a reframing of the notion of structure” (Haggis, 2008, p. 8). This is what Deborah Osberg et al. call an emergentist epistemology, which challenges the epistemologies that underpin a large amount of both qualitative and quantitative research (2007). At the heart of this challenge is complexity’s insistence of methodological approaches that can make sense of complex social systems that often are influenced by non-linear causality and occur within ‘boundaries’ that are fluid and porous. These systems are difficult for the researcher to conceptualize and (re)-present.

While complexity thinkers contend that complete explanations of events are rarely possible (Doll et al., 2005) they do not necessarily do so on subjectivist grounds alone but rather based on an argument that highlights the ontological demands of adequately analyzing and representing the complexity of the world. In this way, complexity differs from the turn in the social sciences toward “interpretative, post-modernist and criticalist practices and theorizing” (Lincoln & Guba, 2000, p. 191). Complexity theory highlights the need for understanding and reflecting on the social structures and experiences that affect researchers and the representation of their ‘data’ as well as the effects of such research on the spaces in which ‘information’ is ‘collected.’ Conversely, an ontological view grounded in complexity leaves room for a reality that is not purely subjective while acknowledging “any particular event may be regarded as having infinitely many different aspects of characteristics which cannot all be accounted for by a finite set, however large, of explanatory statements” (Hempel, in Brown et al. 1981, p. 164).

Qualitative approaches can be of value then by offering a more complex view of social phenomenon than quantitative approaches alone. However, such approaches still are challenged to represent dynamic complexity fully. While approaches like ethnography offer a robust body of practices for understanding the complexity of meanings and interpretations, these approaches

alone are limited in terms of gathering extensive enough data to account for the full range of complexity and interconnectivity that exists in the world. Haggis puts it this way:

although interview studies may sometimes gather data at two or three different points in time, the range of conceptual resources available for discussion of fluidity and change in relation to process and interaction is currently limited (Seibt, 2003), and this limitation is enhanced by cross-sectional methods of analysis. (Haggis, 2008, p. 5)

The challenge complexity scholars mount not only calls into question the researchers' ability to collect and interpret a far-reaching enough set of data but also raises serious issues with relation to notions of ontological priority. Haggis expresses concerns with both quantitative and qualitative research in this regard. He contends that such attempts to "see through difference to 'what lies beneath' ... a search for a subtle form of deep structure" (Haggis, 2008, p. 3) are misguided. While he acknowledges the need for multiple points of reference within complex systems, Haggis critiques comparative analysis, warning of the dangers of 'context stripping' which often occurs in attempts to find crosscutting thematic threads. Researchers impose thematic significance giving undue privilege to certain processes within the complexity of interactions and patterns, which make social phenomena possible. He explains "to create a theme, the focus of attention is named, bounded, and removed from the complex web of its contexts" (Morrison, 2008, p. 3). He asks "what if all of the factors in a particular situation were equally important, or if something that was determined to be unimportant was actually creating an effect of the phenomenon being studied" (Morrison, 2008, p. 3).

Complexity researchers therefore offer no easy answers; rather they tend to call for an 'all hands on deck' approach to research methodology. Some researchers, like Goodwin (1994), undermine qualitative versus quantitative arguments advocating instead for "a science of qualities that is not an alternative to, but compliments and extends, the science of quantities" (p. 198). This is not to say that such compliments are viewed as unproblematic. Rather the depths of

this critique leaves the door wide open for a wider range of methodological approaches and highlight the need for more complex and integrated approaches.

Rather than offering highly defined methodological recommendations, complexity raises more questions than it answers about the fundamental assumptions embedded in existing educational research methodologies. However, Horn (2008) argued that while incomplete, a complexity research lens offers an important shift in research focus as it; looks for self-organization among elements of complexity, places an object back in interaction with its environment, puts the observer in the 'experimental' situation, seeks temporality and looks for self-organization.

While one may contend that there is nothing new in this approach, Horn (2008) offers insight into the importance of a complexity approach that privileges: process and context over outcomes; minimizes the ontological priority of individual agents and undermines the idea of control parameters that are stationary (Horn, 2008). He summarized his point this way:

with the lens of complexity we are able to see whole systems as irreducible examples of knowledge in action, thus establishing a clear link between behaving and thinking...it is, after all is said and done, the evidence of behavior coordination, or shared meaning, that allows us to observe that information expression has, indeed, resulted in communication. (Horn, 2008, p. 137)

An ontology informed by complexity when applied to education makes room for epistemological commitments grounded in understanding the relationships between multiple systems of knowledge, meaning, and behavior. It follows then that participation, observation, and semantic analysis are needed when seeking an epistemic window into a complex and dynamic world or set of overlapping worlds.

Layered Methods for Researching Educational Responses to Complexity: Narrative Inquiry, Ethnography and Autoethnography

Complexity theory calls for layered methodological approaches, which can attempt to

make sense of the heterogeneous influences that affect learning. With this in mind, I utilized, narrative inquiry (NI), ethnography and autoethnography as complementary methodologies that could assist in highlighting the richness of peace educator's ontological insights and responses to global complexity and make more explicit my own reflections in trying to making sense of such contributions. This section offers a brief overview of each of these methodologies to illuminate how I understood and used those methodologies in my research.

To begin with, NI offers a rich and varied body of practice in the field of educational research and has a long history within the social sciences, health sciences, psychotherapy, and a range of other disciplines (Borden, 2009; Chase, 2005). It is increasingly used in educational research (Connelly & Clandinin, 1990) as a qualitative tool for analyzing the complex and storied lives that educators, students and communities live together. NI is meant to be a collaborate research framework and while the researcher may have a thematic focus or even set of research questions, those questions are expected to change and develop in response to the experiences and insights of the interviewees (Clandinin & Connelly, 2000; Pinnegar & Daynes, 2007). Informal interview techniques are often used in NI, as it is important for the researcher to get a fuller picture of the lived experiences of practitioners and the context in which they make sense of their stories.

The focus of NI is both on the significance of the stories people tell, how they are told and the context in which they are told. NI requires self-reflexivity on the part of the researcher and calls for critical appraisal of the choices one makes in reconstructing the telling of participant stories and assigning significance within those narratives. Susan Chase highlights the contingent nature of this approach where the "subject positions, social locations, interpretations, and personal experiences" are examined "through the refracted medium of narrators' voices"

(Chase, 2005, p. 666). Thus, the researcher's role in constructing meaning is highlighted and positivist ideals of objectivity undermined in favor of subjectivist and self-reflexive accounts. In this way, NI is combined frequently with auto-ethnographic accounts on the part of researchers to highlight a fuller range of influences on the ways in which the researcher is making meaning.

NI makes room for complex accounts of causality particularly in terms of social change as the researcher attempts to highlight the voice of those being researched and the reasons they cite why change is taking place and how all parties involved are making meaning from those changes. NI may be combined with ethnographic accounts further to enrich description of the contexts in which people are constructing their stories. Sociologist David Silverman noted:

all we...have are stories. Some come from other people, some from us. What matters is to understand how and where the stories are produced, which sort of stories they are, and how we can put them to intelligent use in theorizing about social life (1998, p. 111).

Ethnography is a methodology that can be used to aide in these attempts to understand where and how subjectivities are produced. Ethnography emerged as a research methodology in Anthropology and has been applied widely and extensively in educational research (Anderson, 1989). Major contributions have been consolidated in the academic journal, '*Ethnography and Education*' and in the series of books under the title, '*Studies in Educational Ethnography.*' In terms of process, Ethnography is an observational methodology that according to Hammersley and Atkinson (1995) involves "watching what happens, listening to what is said, asking questions—in fact, collecting whatever data are available to throw light on the issues that are the focus of the research" (p. 2). Ethnography often involves participant observation as well as other methods and in keeping with its anthropological roots, tends to focus on the influence of culture on behavior and the production of meaning (Kelly & Lesh, 2008).

Many Ethnographers emphasize the importance of long-term engagement with

participants in the social and cultural spaces they frequent. Geoffrey Walford contended:

a basic tenet of ethnography is that the best way of getting to know a culture is through first-hand involvement. Ethnographers work on the premise that there is important knowledge which can be gained in no other way than just 'hanging around' and 'picking things up.' (Walford, 2007)

While observation of and participation with research subjects is central to this approach, Geoffrey Walford contends, "it is inevitable that the ethnographer is his or her own primary source of data. Whether the researcher's subjectivity is a weakness or strength is not the issue, it is simply an inevitable feature of ethnographic (and much other) research" (Walford, 2001, p. 9).

Walford acknowledges both the necessity of subjectivity while minimizing the significance of interrogating the limitations and assets of this form of research. Paul Atkinson argued that when researchers write up their analysis it typically is "more clearly located within a constructivist context of writing" (Atkinson, 1990, p. 61), while "transcription uninterrupted by self-conscious intervention or reflection" (Atkinson, p. 61) has often been the hallmark of less self-reflexive accounts of ethnography. Atkinson rightly concludes, "*both* phases of the work involve the creation of textual materials; both are equally matters of textual construction" (1990, p. 61).

Autoethnography has emerged as a methodological tool for exploring more explicitly researcher perspectives and their influence on knowledge production. It aims to explore the personal story of the writer and their understanding of the influences of culture on their thinking both in terms of the cultural terrain in which they are familiar and in terms of the places where the research is taking place (Dyson, 2007, p. 36). Educational researcher and teacher, Michael Dyson argued for the importance of autoethnography in the field of education when he wrote:

Perhaps herein lies the beauty of this methodology and its unleashed power in education, 'A profession of stories' and a profession who profess to be the transformers of society. The writing of transforming auto ethnography, containing multiple layers of

consciousness, connecting the personal to the cultural and embracing the power of metaphor, has the potential to move both the author and the readers into the 'Landscape of Transformation.' (Dyson, 2007, p. 46)

Dyson's words echo the work of other researchers who draw on autoethnography as a method for focusing on the personal nature of knowledge construction and the central role of researcher subjectivity in knowledge construction (Bochner, 2000; Denzin, 1997; Denzin & Lincoln, 2000; Ellis & Patton, 2002).

Complexity theory contends that the social world is influenced profoundly by diverse and complex social, cultural, political, economic, and other forces that converge to influence educational processes and outcomes. As such, educational researchers drawing on an ontology informed by complexity are tasked with elucidating a wide array of social, material, and cultural influences. Deborah Osberg, Gert Biesta and Paul Cilliers also point out "with complexity... 'knowledge' and 'the world' should not be understood as separate systems which somehow have to be brought into alignment with each other, but that they are part of the same evolving system" (Osberg et al., 2008, p. 3).

Bearing this in mind, I eventually settled on this layered approach drawing on ethnographic, narrative inquiry and auto-ethnographic approaches. Ethnography emphasized the importance of fieldwork and generating descriptive data from the insights of participants and careful observation of the larger social and cultural contexts where they live and work. In the data chapters, I draw on these field notes to provide a fuller description of the context in which educators are working and generating their situated responses to complexity and to highlight my own responses and understanding of those environments.

I used NI to provide an analytical resource for considering the significance of the stories that people tell and the complex webs of meaning that inform those ontological insights. The

data chapters in this work consistently feature some of the stories that the educators who I interviewed told. They also often make explicit the stories I tell of my encounters with these educators and my attempts to understand their efforts as a scholar/peace educator interested in using complexity theory as an analytical tool for understanding possibilities for praxis in response to global complexity.

Finally, autoethnography allowed me to locate myself in the research more fully and to explore the relationship between my positionality and the intentions, values and questions that motivated me to undertake this project. The following account briefly highlights some of those experiences and the ontological and epistemological changes that led to this methodological approach and my interest in complexity theory.

Autoethnography as Method: One Peace Educator's Story

Never regard your study as a duty, but as the enviable opportunity to learn to know the liberating influence of beauty...for your own personal joy and to the profit of the community to which your later work belongs. Albert Einstein

There is a rich body of literature on peace education practices produced by both academics and practitioners worldwide (Bajaj 2008; Burns & Aspeslagh 1983; Reardon 1993; Synott, 2005). Their work offers critical insights into how peace education programs operate often drawing from field research and/or the embedded experiences of practitioners. Such efforts provide valuable insight into the embedded practices of peace educators and the application of a wide range of methodological approaches for analyzing them. This auto-ethnographic account is an effort to make more explicit my own intellectual development and what led me to attempt to understand my own experiences and these experiences of other peace educators from the point of view of complexity theory.

This dissertation is embedded in my journey as an unconventional educator and my

struggle to understand what it means to educate for peace. That journey over the past decade has been something I have understood as a move toward greater holism and synthesis and a move away from seeing the world in fragmented and static terms. In this work, I have carried a question with me around the world and sought to engage other people in addressing it: how best can we further opportunities for people to learn in ways that actualize their highest creative, compassionate, and critical potential, and support them in engaging within an increasingly complex world?

Over time, I have become increasingly convinced that effectively responding to this question involves an educational orientation that strives toward meeting life in its full complexity. That perspective has everything to do with my own positionality, as a global educator struggling to respond to the complexity of the world and the highly varied social and material contexts in which I found myself. It is from that transnational mobile location (which I explore more deeply below) that I encountered and was inspired by many other educators with a peace and social justice focus. I came to believe their work was significant in ontological terms in that it offers an epistemic mirror of the vibrancy, dynamism, and adaptability of the world—in short, it offered insight into global complexity and in terms of peace education the potential/reality of a global and emergent system of knowledge production.

As a practitioner/researcher I have found myself embedded in this context for over a decade and I have struggled to find ways to conceptualize and analyze how such innovation is taking place within the many complex interrelated ecologies of learning that exist on the ground. While conducting research on peace education efforts in Scotland I noticed a shift in my thinking in response to the dazzling diversity of peace education efforts taking place there, as I increasingly began to believe that each individual and project offered an important epistemic

window into how to support people in becoming peacemakers within a complex world. I then have increasingly grappled with the conceptual tools/orientation to understand best the complexity of our responses to these varied and constantly changing contexts. As I more recently opened up to the need to ground both my peace education practice and research in a theory that attempts to make sense of global complexity, I sought to draw on complexity theory both to examine my own experiences and explore other educator's consciousness in this sphere.

I grew increasingly interested in some of the central questions with which this dissertation engages; from what methodological perspective and how we best get at what these educators are doing in response to global complexity? How do we know a complexity-inspired orientation when we see it in education? If complexity is an ontological reality, are educators in radically different contexts operating from that ontological perspective themselves? If so, how? How are educators epistemologically innovating or struggling with these conditions?

I was increasingly interested to understand not only what peace educators were doing but also how they were adapting to their changing and complex worlds. How did they understand/struggle/respond to global complexity? How could I understand a response to complexity when I saw it? In what ways was their work opening them to other actors or bodies of work? Where were their efforts leading to surprising outcomes? I thought such questions were of great utility because they might allow for reimagining and embracing rather than resisting dynamic relationships and possibilities within the field of peace education.

I was aware that there was an entire discourse about the contingency, dynamism, complexity, and adaptability of phenomena across systems and scales that may help me move forward. I was fond of the work of Fritjof Capra ever since I had read him more than a decade

before this project, during my undergraduate studies and I had also read Joanna Macy, James Lovelock's *Gaia Hypothesis* (1973) and a number of other authors who looked at complexity and systems theory. Following the completion of my master's degree program, I was interested in exploring that theoretical work more deeply and to apply it to education and in particular peace education. I wanted to understand the ontological orientation that peace educators were adopting in response to global complexity from the framework of complexity theory.

I began by reaching out to a new faculty member at the University of Bradford, Graeme Chesters, who specialized in complexity theory to see if he was interested in supervising my project in which I hoped to examine peace education with a complexity theory lens. I was aware that he had used complexity theory to understand social movements and was fortunate that he was interested in this work. His work was clearly relevant to my own, not only its theoretical contribution but in its focus on social movements. I viewed peace education as a global educational movement and my experiences as a practitioner/researcher led me to believe that complexity theory might help provide a metaphorical and analytical language to grapple with the dynamism of the field.

I then began the research for this project in pursuit of a methodological approach that might respond to the ontological demands of tracking complexity within and across these highly diverse 'global' spaces. In other words, I sought to deduce a research methodology that was epistemologically congruent with the ontological implications of global complexity. That commitment grew out of my work as a peace educator and especially my experiences in Scotland in 2005 compiling a national database of peace education efforts there. I knew that my new research would need to set me adrift once again within peace education networks, exploring the creative canals and backwaters that educators were navigating. If my sense that the

methodological diversity of peace education was a reflection of an ontological sense of complexity then I maintained that I would need to move into and across diverse locations to get a better sense of how educators were conceptualizing and responding to global complexity from within their radically different positions. My goal then at the start of this project was to meet these educators in the embedded sites of complexity, which they called home and to engage in conversations that sought to illuminate their understanding of global complexity.

Methodological Implications of Coproducing Knowledge from Within a Complexity View

Guba and Lincoln point out in the *Sage Handbook of Qualitative Research* that self-reflective processes, in particular reflection on “the meaning-making/sense-making/attributional activities,” is critical when conducting research and should not be ignored as they necessarily shape the action of the researcher (Lincoln & Guba, 2000, p. 191). In acknowledging that the multiple complex, changing and embedded contexts I lived in had a considerable effect on this work I hope this self-reflexive account puts forward a more honest retelling of my continually emerging and changing understanding of the political, social and educational view of the world. From a complexity informed methodological perspective that understanding took shape not only because of interactions with the people I formally interviewed and the projects I researched and wrote about in this work but also in term of my holistic experience of actually being in the various locales.

Acknowledging that my understanding then developed and grew with people and in places that are not written about in this work, I hope here to offer a window into the process of orienting myself in these locales during this research project and to highlight some of the ways that engaging in conversations with people about their lives, work, politics and views of the world influenced how I navigated those contexts. In particular, as a fellow peace educator and researcher, I was sensitive to issues regarding power (e.g., the power of being a researcher, of

being American, male, an outsider/insider), and the significance of the very different cultural backgrounds from which we were coming. I tried to be aware in all contexts of how I was being received, how people were responding to the questions I was asking, what was appropriate in terms of behavior, and when I needed to be silent and listen or diverge from a preconceived idea of the conversation I may have held beforehand.

I walked a line between outsider and insider (especially in India and Japan) as I was both a foreigner and researcher (outsider) and in most cases, a fellow peace educator/friend of a specific colleague/family member (insider). My role as an insider often meant that we had a sense of connection and common ground as peace educators (or one degree of separation from a peace educator). I often felt supported in being explicit about the experimental nature of this process and my own personal ontological journey toward trying to understand how more effectively to navigate complexity and the processes that might make a global knowledge system possible. I tried to offer a self-reflective account of the context of my experiences to those I interviewed, and I often spent time meeting many people whom I did not formally interview that were involved in the peace education networks in the locales I visited. This I believe was in keeping with a complexity informed methodology that holds “emphasizes the interactions between variables within the system as equally if not more important than the variables themselves” (Radford, 2008, p. 151).

From an ethnographic perspective I did not locate myself as either purely an inside or outside researcher. Clearly, there were ways in which I was connected to these varied contexts and as such, I saw myself as both. My approach differed from Hammersley and Atkinson’s definition of ethnography when they contend “there must always remain some part held back, some social and intellectual distance. For it is in the space created by this distance that the

analytical work gets done” (1995, p. 115).

It was not that I was an outsider because ‘I held back’ or had an ‘intellectual distance.’ My identity as an outsider was reinforced by real difference, both in terms of my own sense of identity, the locale and how I was perceived it. My lack of knowledge about the local context and the obvious fact that I came from a very different place as well as my connection with people locally as a peace educator with affinity and interest around this work and close connections to people in the area made for a messy identity in relation to the binary analytic of insider/outsider often used in qualitative research. Further, as has been reiterated throughout this section the complexity of these highly varied social and material contexts in which I found myself was affecting me in a multitude of ways that are both difficult to analyze and to isolate in terms of their effects upon my identity as a researcher.

With that said, I offer some further description and analysis in this section of the influence of the research environment on me and the impact of some of the transnational relationships that helped shape my experience. I do so not to highlight these as the only, or even most important factors but to provide a richer and more complex descriptive account all of which influenced the narrative I constructed when (re)presenting the interviews and the significance of the interviewees work. Here I would like to focus specifically on Japan and provide some insight into my experiences in the lead up to and during the trip.

In Japan, I worked with a longtime friend and former coworker of mine in Yokohama who had lived in the US. We initially were colleagues at the World Peace Sanctuary in New York. I also collaborated with another Rotary Peace Fellow who had grown up in Hiroshima and worked as a peace educator there for many years and whom I met in Bradford, England during our studies there. She set up the bulk of my interviews, prepared me on each person, and

arranged for translators who were already familiar or engaged with peace education work.

Shortly before I arrived in Japan, I received a spreadsheet with all of my contacts, dates for interviews and the institutions or key people with which they worked. I arrived and met people in the community and engaged in late night discussions with my hosts and other contacts there.

Many of the interviews took place in Hiroshima and while I had been to Japan before I had not been to Hiroshima. My interviews there were deeply affected by my nationality, being from the US (outsider) was significant for both the people I was meeting and me given the brutal history of the US's relationship with Japan during WWII. The power and pain of that relationship often permeated my conversations and I spoke openly with my hosts and a number of the people in the community about the difficulties of our very different relationships to that history. The threads of connection between us as peace educators in Japan shaped my interviewing approach and we related as fellow peace educators (insider) and ironically in part through a shared history of war.

Because of this difficult past/present, I consciously listened more and was fully committed to learning as much as possible about the pain and horror that resulted from those actions in addition to engaging with their responses to my core questions. I tried not to push people to talk about their relationship to the bombing, though my mere presence begged the conversation in most cases. I was conscious to remain open and made sure to listen fully, by being aware of my own discomfort. I challenged myself not to squirm or look away from the realities they presented. Their honesty allowed me to clearly express my disappointment with the US's actions and my own sense of agency (or lack thereof) in terms of trying to challenge militarism at home. These conversations often flowed toward interesting intersections of our work, reflections on Japan's imperial past and America and Japan's privileged and problematic

role on the contemporary world stage. Part of the implications of that privilege were that many of us were aided by access to wealth, high speed communication and travel in many of the collaborative projects between Japanese and Americans to which we were accustomed.

In those moments, I was seeing new threads of connections, both in terms of that which placed me as an outsider and therefore influenced what and how I could ask questions and be in those spaces and the ways in which I was inside. The quality, tone, and direction of my conversations in Hiroshima were significantly differently than I might have expected previously. In many cases, these open conversations about the suffering that resulted from the US's actions in Japan as well as educators there opening up about their disappointment and even shame about Japan's imperial past perturbed the more formal tendency and distance of these interviews. When I arrived in Japan, I did not know how to have these conversations per se and my exploration of how to engage in this cultural context, what was appropriate and how the questions I was asking were perceived took time to gauge. While much of that feedback took place with my friends there who I had built a deep trust with over many years, there were a host of other influences, which are not as easy to track.

In terms of my movement between insider and outsider that shifted within each conversation as I moved to different locations at different moments based on the content of our discussion and the material and cultural cues to which we were all responding. At some points during our conversations, the person being interviewed would say something like, "of course you wouldn't know this but here we have the challenges of..." thus reiterating difference. On other occasions, they might tell me they were also interested in my work, as a fellow peace educator and we would talk in the language of shared common ground inside this field held together by a sense of affinity and interest. My commitment to speaking honestly about issues of power, my

attempts and being sensitive to these and other dynamics and our shared commitment to learning, I believe influenced the quality of those conversations and helped to deepen honesty and trust in the interviews.

As I have highlighted here, my orientation and understanding of the specific locale I was researching and the significance of peace education praxis there was often heavily impacted by a host of influences outside of my formal interviews. In this section, I point to the complex convergence of culture and place and the significance of my attempts to negotiate the varied global-local relationships that I became embedded in over time. Indeed, those experiences and that context are significant as they exerted influence on the research processes. Some of those influences are addressed here to try to offer a more honest and comprehensive layered account and yet this section offers, at best, a partial window into the complexity of my experience as a global peace educator/researcher.

Ethnography as Method

The research for this dissertation took place mostly between March and August 2006 and was funded by Rotary International. I chose sites in Japan, India and the US for a number of reasons. To begin with, I am a US citizen and have spent the majority of my life living and working in the US and thus was generally familiar with the peace education landscape and cultural contexts there. I chose India and Japan as I had strong peace education contacts in each of these countries as I had visited and worked there previously. I thought those experiences would better enable me to conduct more productive interviews as I was, to some extent, familiar with the contexts, histories and educators who were positioned within these radically different locations. Equally importantly, due to my strong connections with people with whom I had previously worked, several people were willing to introduce me directly to other people engaged

in peace education there. I did not need to ‘cold call’ anyone and I believe the honesty and depth of our conversations were aided by the introductions I received from colleagues and friends as I was connected to these educators through people they knew and trusted.

This approach can have significant drawbacks as there is extensive literature documenting the dangers of gatekeepers or elite informers in social scientific research (Emmel, Hughes, Greenhalgh & Sales, 2007) regarding issues of trust between gatekeepers and ‘marginalized’ groups as well as the influence of the bias of these individuals on the research topic. While those limitations certainly were present, the contacts I used were most often educators who had long-standing relationships with other educators whom they related to as colleagues and friends.

As my research sought to understand different narratives that reflected the specific complexity of place, and the transnational webs of relationships and multiple complex and interrelated systems that often influenced situated knowledge the project in Japan, India and the US provided rich contexts in which to understand peace education from multiple standpoints. These sites were also appealing to me as I was interested in the ways in which conversations around innovation and global complexity in international education would differ within spaces of varied degrees of industrialization and informationalization and these places offered significant difference in this regard.

In terms of chronology, I traveled first to Japan and then to the US and finally to India and I did not return home during that time. I lived fully nomadically during this six-month time as a researcher. I spent five weeks in Japan (March-April, 2006), a little under a month in the US (April-May, 2006) and four months in India (May-September, 2006). I spent far longer in India than either the US or Japan as it took me longer to set up meetings and become oriented to the

cultural context. I had also been in Japan more recently than in India and had more regular interactions with peace educators there as I had consistently been working with Japanese organizations on peace education projects over the past decade. Thus even though Japan was equally difficult to communicate in given my lack of linguistic proficiency I had more consistent cultural contact, and a sense of deeper cultural fluency and a broader network of contacts through which to gather information and arrange interviews.

For these reasons, in India, I had a more acute sense of the degree to which I was unfamiliar with the landscape and spent the first two months meeting peace educators there and trying to get a sense of who was involved in the peace education networks. Further, amongst elites in India there was a very widely held narrative that since the time I had first visited India in 1997, it had undergone a radical economic and social transformation. It took time then to unpack that narrative and engage peace educators on that theme and to get a sense of the degree to which the political and economic terrain had changed there since my last visit. It may have also been that since India was until recently considered a ‘developing country’ and still lacks some of the comforts and familiarity of Japan or the US, I was more apt to relate to it as different and therefore spend more time seeking to orient myself to the environments there.

During the research period, I used a variety of methods to explore the ways in which individuals within these learning collectives in India, Japan and the US were living, adapting and changing to global complexity as I sought to understand more deeply the affects this complexity had on their view of peace education over time. These methods included qualitative interviewing with a mix of semi-structured and informal conversational styles, ethnographic participant observation, archival collection of educational materials that I obtained from interviewees or on the sites, and less goal-oriented activities that included hanging out within the locales in many of

the places where the projects were taking place. I also often spent time and was briefed by the people who were doing interpretation for me. These translators were often also peace educators and they sometimes offered me their perspectives on the field and the way peace education was manifest in that locale. The following reflexive account is meant to elucidate further the effects of being nested within multiple complex environments and the larger epistemological challenges this kind of research presented.

Logistical Challenges of Researching within Global Complexity

While I was accustomed to a highly transitory lifestyle in my work as a peace educator, the formal role of a global researcher (Burawoy et al., 2000) was new to me and it presented a host of creative challenges that I did not anticipate. While exciting, this task of moving within and across highly diverse spaces turned out to be more demanding than I had imagined. I knew that traveling through these countries would mean shifting cultural codes and norms as I highlight above and making meaning with significant language barriers. There were also logistical challenges such as tremendous heat (especially in India), small seats on buses that I could not fit into (Japan and India), overcrowded trains (India), and frequently having no idea where I was going (all three countries). While I had traveled and worked abroad extensively, I had not fully considered what it would be like to engage these challenges continually while trying to conduct research as I had little prior experience to draw from regarding that task.

Those specific challenges of conducting research included not only interpretative questions but logistical setbacks such as losing portions of my field notes to monsoon rains and then later to a mouse that lived in my desk where I was trying to do some writing up. Further, there was no way to foresee the emotional, cognitive challenges of trying to situate myself in a location, and then uprooting in rapid succession. I would get a window into the history of the people living in places where I conducted the research, navigate the logistical challenges alluded

to above and begin to build relationships based on a shared passion for transformative education. As a result, I would start to see things anew and then have to rather suddenly pick up and go and immediately do it all over again. The complex interactions of all of these elements at once made for a series of disorienting dilemmas.

Fortunately, that process was filled with as much inspiration as frustration and challenge. For every bus I missed, subway I took in the wrong direction, phone call I made that was dropped or phone conversation where they simply could not make out my strange accent, there were also late night talks about the politics of the places I was visiting, the honor of stories shared about people's families, their work and futures, the little children who waited to greet me in the homes where I stayed and the deep challenges to who I thought I was and what I thought was possible and important in the field.

My immediate past and present experiences were so rich and varied that I was often integrating experiences from my time in one country within a radically new location. Sometimes I even literally lost track of where I was, confusing road names in Japan with streets in India. This created a unique research experience where I was both intensely present due to the difference of the contexts in which I found myself and the demands of adapting, surviving and learning in these new places while I also experienced a sort of complexity induced disorientation and emotional rollercoaster from the speed and intensity which the research demanded. Here Zygmunt Bauman's work in *Liquid Modernity* helped contextualize these challenges as he suggested that such fatigue and even disorientation is not unique (while perhaps intensified by the mobility of my project) as he argued that it is a hallmark of contemporary living. Bauman highlights the uncertainty within what he has termed liquidity modernity, where social institutions are constantly in flux and where individuals can no longer easily make sense of the

bedrock of solid modernity which offered a more fixed and predictable sense of career, place, and culture.

The hallmark of such liquidity in Bauman's view is that individuals must somehow make sense of their lives within these conditions of perpetual uncertainty (Bauman, 2000). Bauman's work accentuates the speed of contemporary times and my position as part of a global elite with access to all forms of high-speed communication and travel. My experiences recounted here highlight my privileged positionality, which made it possible to undertake an ambitious research project. However, I was not as prepared to navigate the embodied difficulties faced during implementation. The project moved much slower on the ground than it did on paper when I was planning it out at the university, as there were numerous existential realities that slowed down my approach. For example, in India as there were physical limits to the amount of walking and moving about I could do in the mid-day heat. There is also a different cultural sense of time there which included a view of temporality that stretched across multiple lifetimes. As a result, the people I interviewed often took a more long-range view of change and acknowledged the depths of challenges more thoroughly than I was inclined to. All of these factors were unsettling to me. This meant in practical terms that I had to temper my desire to get everything done "efficiently" in others through highly directive processes that met preordained deadlines for completion and occurred within the discursive domain I thought was most relevant.

In addition, the pace influenced how and when I engaged in analysis. When I arrived in India, I had just been in Japan and the US and in those contexts the faster the pace the better. India presented the simultaneously relaxing and disturbing time to reflect on interviews more directly after I conducted them and more time to have preparatory conversations that responded to the realizations I may have had from those interviews and experiences. I also could engage

with readings about each area more thoroughly in advance. The pace in India seemed diametrically opposed to the high-speed process of interviewing I had experienced in the urban centers of Japan and the US. Gone was my spreadsheet with virtually every hour of my day mapped out. Instead, I had to find ways to navigate long periods of down time and much slower processes of communication.

I found myself feeling like I was constantly running around, with less time to reflect on my interviews and little down time in the US and Japan and my questions remained largely unchanged throughout my time there. In India, I adapted my questions more as I had more time to unsettle my own definitions of the global and more deeply take into consideration what I had just heard. The influence of the reality of material conditions such as the heat, slower transport across highly varied terrains as well as cultural influences in relation to time, efficiency, and sociality effected not only the questions I asked but also the ways in which I processed them.

This degree of variability in terms of the social and cultural terrain I navigated, the transiency of the process of global researcher and the rigor of traversing great distances made for a host of creative opportunities and challenges during this research project. A realistic account of these conditions further nuances the ontological demands highlighted by complexity and education researchers and illuminates the embodied experience of a researcher adrift within global educational networks. While theoretical recognition of complexity's demands for researchers is important, those demands also must be evaluated in relation to the lived experiences of researchers trying to engage with such complexity. Thus, this section seeks to illuminate some of the applied actualities when generating global research approaches, which seek to respond to the demands of researching complexity.

Interview Questions and Collecting Data

In terms of a complexity informed methodology, I sought to employ what I thought was

the minimum amount of structure that would allow for the maximum amount of creativity during this inquiry. What that meant in practical terms is that I had core questions that I asked virtually everywhere I went and then I would add to or adapt those question based on the context.

Generally, I was interested to understand how educators conceptualized and responded to what they saw as opportunities for growth in their work and the most pressing challenges they faced and how much of that was a response to global complexity. I was looking for the places where they felt the potential for creative growth or where they might feel overwhelmed or stuck. In terms of core questions I asked them how their work had changed over time; what they saw as the unique challenges and opportunities in their work currently; how their understanding of the field had changed over time; what successes in their work had surprised them; and how they were using their resources. I recorded these interviews on most occasions with a digital recorder and took notes.

Admittedly, much of the descriptions and reflections of those various scenes and rich contexts do not appear in the data chapters of this work. In fact, I conducted over 50 formal interviews and after these accounts, I choose several interviewees/projects in each country based on who spoke most explicitly about their shifting ontological vision and adaptive approaches to praxis. While selective analysis of interviews may invite criticism on subjective biases, this choice allowed for the presentation of key thematics as they emerged from actual conversation in interviews and a more well developed thick description of the context and projects. Further, it helped to capture the subtlety, limitations, and contradictions present in the narrative accounts of selected interviewees in response to global complexity.

Marshall highlights the demands of this theoretical sampling approach that I employed. According to Marshall, “theoretical sampling necessitates building interpretative theories from

the emerging data and selecting a new sample to examine and elaborate on this theory.” (1996, p. 523) After reviewing the 50 interviews, I identified three critical strategies that emerged from educator responses to global complexity. These included: 1) attempts to diversify pedagogical practices; 2) utilizing global connectivity for maximizing learning across various networks of affinity and interest; and 3) drawing on concepts in their educational content that were resonant with complexity theory. The projects I chose demonstrated engagement with at least two of these three responses simultaneously.

Moreover, my overall sample of 50 educators was the result of a snowball sampling technique and while I do not elaborate about the weeks of making phone calls and meeting with fellow peaceworkers, friends of friends and other contacts in each location in the data chapters, all of those encounters (and many others) affected my view of what was possible in terms of peace education in that locale and the key thematics that I identified in the research. My interviewing often varied in style and structures. A majority of interviews were conducted in an unstructured and conversational manner to obtain in-depth information about the field or to identify the most appropriate educators. In such cases, I did not use my core interview questions. Those whose narratives are captured in this dissertation were approached with a core set of questions and they were referred to me by other educators who I met as best positioned to provide a detailed account of their work.

Analysis

Overall, I wanted to examine the ways in which peace educator’s framed their engagement with global complexity. I was looking for ontological insights that were in keeping with a complexity lens-Had these peace educators developed an understanding of emergence? How did they conceive of the global? Did they see it in dynamic and evolving terms? To what degree did they see dynamic interconnectivity and in what forms? Toward this end, on occasion I

also asked them: With whom were they working? Who they might want to be in touch with that they hadn't reached out to yet and how they were building their collective knowledge practices?

In terms of analyzing the interviews, I looked through my field notes and journal entries from the times when the interviews occurred. Then I listened back to the interviews that I was able to record successfully. I was looking for several things; First, I wanted to understand the actual projects that educators were working on, the ways they implemented them and the reach and scope of their efforts. I took notes and transcribed the critical components of those programs as I listened back. Secondly, I marked critical moments in the interview that stood out, as they were particularly rich in terms of the educator's responses to complexity and the stories they told in relation to adaptation over time. In these cases, either they were inspired about something, struggling with it or said something that I found distinct from or similar to what I heard in other interviews or from the reflections of other people who had been part of their programs or observed them. In this way, I was looking for both difference and similarity and I was equally interested in both in terms of responses to global complexity.

I would also return to my ethnographic field notes describing my observations of these projects and reflections on my interactions at that time and re-read critical complexity literature in response to insights/questions that were arising. I would then go back and listen through to all the critical interview and observation moments I had flagged up and then transcribe the sections in which I was most interested. This triangulation with the literature resulted in me hearing the interviews differently. As I listened back to the accounts and the reflections of participants and observers, the general descriptions of complexity concepts such as emergence and the edge of chaos would provide analytical guidance for identifying instances where I thought these dynamics were at play. Considering that at the time of initial examination of the data there were

not many examples of the application of complexity theory to examining data on educational change in the field, I paid close attention to moments where these educators noted new ontological insights, the emergence of innovative practices or critical questions that emerged from their praxis. Some of those moments were easy to identify. For example, when Laura Mendel of the Mosaic Project in the USA, in response to the challenges of her work paused during her interview and said, “the problem of the world is simply that the world is not simple.” Other insights were far more subtle or required multiple passes as it disturbed or challenged my own understanding of the possibilities for understanding complexity.

While I did choose certain projects, which I thought highlighted a particularly illuminating form of engagement with complexity, I also struggled with picking certain data. I recognized that my choices in picking that ‘data’ and the framing of the projects was necessarily simplifying things and while I tried not to finalize the people and projects I was working with, I was aware I was working with a limited vantage point and medium for expression. I struggled with the medium of written word in this regard and the reality that I had only a partial snapshot of any one person’s understanding (which is always connected to an entire system of meaning) at one moment in time.

From a complex methodological point of view this approach has several substantial limitations; first, while at times I examined the perspective of multiple actors in relation to each of the projects featured (e.g., students, community members), the number of ‘stakeholders’ I could interview were often limited and therefore narrowed the richness of the description of the complexity of relationships/perspectives this research offered. Additionally, in most cases I utilized a single interview approach, which missed the full dynamism of how parties were interacting and changing over time and the layered meaning that people situated in varied places

within these system were making. Indeed, I was able to glean insight into multiple perspectives in most cases however, these perspectives were still but a small fraction of the range of potential actors who could have been interviewed and observed. Deeper insights into larger pattern formation and the field of possibilities in terms of social structure and knowledge production within networks therefore were missed at least partly because of this limited vantage point. Some of these I only fully understood in the process of researching itself when changes were difficult to make. In all, these limitations could have been addressed more easily in a more collaborative research framework within multiple researchers, including community researcher embedded in each of the locations that I visited. Those teams then could have made meaning together over time and with various iterations.

This is significant from a complexity methodological point of view as I struggled with decisions about which perspectives to include because complexity problematized the prioritizations of certain perspectives, projects, and individual influences over others. The singling out of specific variables creates a problematic epistemological issue for a complexity researcher and I struggled intensely with this, as knowledge production from a complexity view is a distributed rather than centralized or purely individualized perspective. This was Mike Radford's point highlighted earlier that complexity undermines ontological priority and highlights the need and the near impossibility of accounting for the complexity of simultaneous influence (Radford, 2008, p. 164). This challenge became increasingly significant as I wrestled with critical questions during my analysis about what information to include, what factors, influences and projects should be highlighted and which would be 'left out' and how to represent the dynamism that my interviewees described and I observed.

Toward Conclusions

This chapter offered an overview of the research methodology used in this dissertation. It began by examining the ontological and epistemological demands of complexity-inspired research. It drew on the work of Haggis (2008), Osberg (2008), Radford (2008) and other complexity thinkers in framing the difficulties with methodologies that overemphasize linear causality and simple positivist approaches to research. These ontological and epistemological critiques highlighted the need for developing methodological approaches in educational research that are more complex and thus this chapter highlighted key qualitative research methodologies that could assist in researching complexity. Thus in methodological terms complexity provided key sensitizing concepts that aided in the selection of the methods for examining the adaptive practices of peace educators used in this dissertation.

This chapter therefore, highlighted the need for layered approaches and outlined why autoethnography, ethnography, and narrative inquiry were chosen to examine the data for this research project. While each of these approaches offered an incomplete method, together they provided a rich array of analytical resources. Ethnography and narrative inquiry allowed for a thick description of the conditions, educational projects and interpretations and meaning construction of interviewees and participants in the educational project reviewed. Autoethnography allowed for greater self-reflexivity and created to space for me to reflect on the epistemological struggles that arose during my work as a global peace educator committed to supporting knowledge production across diverse global spaces within the field. This chapter therefore offered both a descriptive and analytical account of others' responses to complexity and a self-reflexive account, which elaborated on a fuller range of influences that affected the choice to engage in this research project in the first place and key dynamics that affected the

collection and analysis of the data at various sites. This chapter then ended by highlighting the process of ‘collecting data’ for this dissertation and included a reflexive account of the methods used, the process of adapting them to the research context in which they were applied and the process through which I conducted my analysis.

In sum, this chapter explored both the conceptual and theoretical demands of research from a complexity theory lens and the applied challenges of conducting a global research project. While the layered approach described here may be more effective in its description of complexity than methods that have been used typically in the past it is also incomplete, and points toward the need for greater methodological complexity in analyzing educational responses to global complexity in the future. These shortcomings suggest that collaborative and interdisciplinary research frameworks may be needed as they can support multiple researchers in collecting and examining the data and greater involvement of people who are embedded in the research sites being examined.

Because of these limitations, this work offers an embryonic example of praxis in light of the scope of those challenges, revealing perhaps, as much in what it did not do, as in what it accomplished. In all, this chapter sought to both make explicit my methodological approach to this research while also demonstrating that this method was not developed ‘outside’ of global complexity. Rather, this critically self-reflexive account described some of the ways that my engagement as a peace educator with both global complexity and complexity theory informed a substantial shift in my research interests in peace education over time and my understanding of complexity-inspired research. Most importantly, it nuances the arguments highlighted throughout this work that critique the limitations of reductionist epistemological and ontological approaches and makes explicit not only for new pedagogical responses to complexity but for new research

methodologies for understanding the complexity of those approaches.

Chapter 6: Teaching for Peace-Approaches from the Field

Introduction

This chapter highlights the practices of educators in Japan and the US and grounds the preceding theoretical explorations of the potential relationships between complexity theory and peace education. Complexity theory is utilized in this chapter as an analytical device for understanding the pedagogical adaptations that educators reported they were making as they responded to the dynamic and changing complexity of the contexts within which they were situated. Thus, in this chapter, I seek to illuminate the application of concepts from complexity theory in examining innovation in response to global complexity within the international field of peace education.

The educators featured here shared a common struggle to come to grips with and develop pedagogy, which they believed could address some of the most complex social and ecological issues facing their communities and the planet. This ontological imperative requires pedagogical change over time and each of the educators interviewed expressed their work in those terms. They emphasized the importance of adaptation in light of their own understanding of educating for peace, an understanding that was not represented as simple or fixed in any of the cases analyzed. The data presented in this chapter therefore offer a window into these educators' changing ontological orientations. It also examines the pragmatic constraints, and opportunities they faced given the dynamic contexts in which they operated and the choices they made over time when dealing with complexity.

Those choices varied greatly as did the social contexts in which peace educators in India and Japan were situated. As a result, they demonstrated a wide array of social technologies and pedagogical approaches to the field that will be analyzed throughout this chapter in light of the

demands of complexity and the analytical resources of complexity theory. It is within this mutually influencing local and global dynamic, or to borrow Urry's (2003) term, 'glocal' positioning, that several major trends emerged from the practices of peace educators in India and Japan. First, peace educators emphasized the importance of engaging with global connectivity. Global connectivity, as the term is used here, refers to far-reaching changes that include the ability for greater contact between people via high-speed travel, increasing sets of shared cultural symbols and values circulated via global media, and the ability to have real time conversations across great distances via the Internet.

In addition to using global connectivity to engage people across areas of shared interest, educators also sought to respond to complexity by diversifying their pedagogy. These educators supported students in stepping out of the classroom and into a range of 'alternative' educative environments. They also utilized an increasingly complex array of pedagogical processes as they integrated music, art, field research, community-based educational practices and a host of other modalities into their sessions. This chapter examines how these efforts to generate greater pedagogical diversity were at times in accordance with the ontological insights of complexity theory.

Finally, peace educators in the US and Japan not only adapted their teaching practices but further developed their curricular materials and areas of thematic interest in hopes of more effectively teaching about global complexity. While their attempts were not explicitly framed in the language of global complexity, those efforts reflected a changing ontological orientation whereby educators attempted to generate curriculum that represented complexity in increasingly dynamic terms and with a growing sense of profound interconnectivity between phenomena. As a result, this chapter examines both how peace educators teach about global complexity and the

ways in which their approaches to peace education are pedagogically in accordance with insights from complexity theory. This opens up a rich discursive space for considering the ways in which such co-evolving pedagogical and curricular endeavors are interdependent.

In all, this chapter is an examination of the opportunities and challenges that arose when educators in Japan and the US attempted to multiply opportunities for students to engage with complexity. While the examples offered below do not offer a complete response to the demands of complexity, they do provide some critical examples that further illuminate the field of possibilities when considering complexity-inspired education. Thus, the data provides an important opportunity to identify applied orientations toward praxis that are changing over time and some of the contextual influences on that change. This chapter further develops the argument that there is a need for requisite pedagogical variety in response to the demands of complexity and for better-developed analytical tools in which to examine and theorize such responses. This data then provides a valuable analytical opportunity to explore the degree to which situated pedagogical approaches in peace education are in keeping with insights from complexity theory.

Teaching for Peace in the Field—Hiroshima

The city of Hiroshima officially was dubbed a ‘city for peace’ in the rebuilding efforts that followed the devastating effects of the United States’ decision to ‘test’ the atomic bomb there. Hiroshima has served as a hub for peace education efforts since that time and now officially supports a peace education curriculum in all schools within the city limits. The degree of institutional commitment to peace education is unique in the world with members of their board of education dedicated to this purpose of citywide integration of peace education content.⁴⁰ In addition, a host of other organizations support peace education in the city including; The

⁴⁰ I have met representatives from the Hiroshima Board of Education who provided extensive background on these efforts.

Hiroshima Peace Institute, The Hiroshima Peace Memorial Museum and Khastanto (Japan's Teachers Union).

While I was in Hiroshima, I conducted a series of interviews with representatives from these organizations as well as several professors at the university and teachers in the school system there. Out of 10 interviews conducted in Hiroshima,⁴¹ only 2 interviews are featured in this chapter as they most explicitly and comprehensively articulated their insights about pedagogical innovation over time where other interviewees offered more descriptive and less self-reflexive accounts of the educational activities in which they were engaged.⁴² Further, because of their self-reflexive accounts these two interviews revealed more vividly these educators' ontological shifts in response to global complexity as they conducted their work over the span of three decades.

When I asked peace educators in Hiroshima about how peace education had changed through the years, the majority emphasized adaptation in light of the importance of changes that had occurred regarding both pedagogy and content. This focus on both pedagogy and content is used then to organize the primary examples in this section drawing on complexity theory as an analytical tool for understanding efforts to engage with complexity in each of these domains. First, in terms of pedagogy, virtually all of those I interviewed spoke of the narrow pedagogical approaches often used in teaching peace in the early days. Many peace education programs used the traditional banking method that was critiqued by Friere. (1970) Mister Matsui, a math teacher and peace educator at Ujina Middle School for the past 30 years, was quick to point out that the

41 During my stay in Japan, I have met over 15 peace educators representing peace educational organizations and peace research communities. In Tokyo, I have met more academics focusing on peace research. In Hiroshima, I have engaged in more practitioners engaging in peace educational activities.

42 The interviews featured here took place at the end of my time in Japan and these more self-reflexive nature of their commentary was partially prompted by my growing interest in how they understood the changes taking place in their praxis over time. Thus in fairness to those interviewed earlier, their more descriptive accounts were in response to my questions, which asked for that kind of information.

methods originally used needed to change. Hiromi Morita⁴³ who was translating for our interview agreed so strongly with Matsui that she added during the interview, “when I was a child (in Hiroshima) we watched movies and had to make an essay and explain how we felt and we could make a good essay without really feeling (peace education).” From her point of view, as a former student, she recalled that peace education was often about regurgitating what she and her colleagues thought teachers wanted to hear without really being affected personally by the material.⁴⁴

Mister Suigera the director at *Kaihantsao* (Japan’s Teachers Union) Hiroshima office contended that peace education pedagogy in Japan had to undergo substantial transformations nationally since its inception after World War II. Suigera expressed his agreement with other peace educators in Hiroshima arguing that it is necessary to have pedagogical approaches that are more diverse and “not so much lecture.” He explained that the increasing complexity of pedagogical approaches within the peace education movement in Japan has been aided by alternative pedagogies from throughout the region including practices primarily from “China, Korea, Singapore, and India.” These relationships between peace educators in the region made for an expanded field of possibility. Suigera’s recognition of regional influence and co-evolution of pedagogical processes also suggests an understanding that peace education in Japan is not a closed system but rather is porous with multiple pathways for influence and emergence in terms of pedagogical adaptation. That sense of needing to open up to the world and work with people

43 Miss Morita is very much a peace educator in her own right and writes for the local newspaper on such subjects.

44 Miss Morita’s comments were insightful and also reminded me of the difficulties of collecting data through translation. She obviously felt very strongly about peace education and while the rapid rhythm of the interview seemed to suggest that she was translating ‘word for word’ I was left wondering what were her words and which were Matsui’s which while a constant issue when conducting interviews through translation was made apparent when she stepped ‘out of role’ during the interview. While quoting the translator is not usual practice I thought it necessary to do in this situation both to show that she wanted to affirm what Matsui was saying and the challenges of translation.

abroad was a sentiment that many of the peace educators in Japan expressed.⁴⁵

Regarding peace education content, Hiroshima has generated an increasingly eclectic thematic terrain over the past four decades. From the mid-1940s through the 1960s, peace educators in Hiroshima focused primarily on the historical legacy of the A-bomb. As a result, their programs seemed to students to be relevant only to some distant past and were valued insofar as necessary to make a good grade. Miss Youmane at the Hiroshima Peace Museum spoke to the shortcomings of such approaches, explaining that many programs were simply too heavy and serious for students. She spoke of the need to make the museums educational programs more dynamic. Citing the museum's summer camps as an example she painted a picture of the time when kids at camp ate canned beans and other types of rationed food, listening to stories and accounts from survivors and watched movies of the devastation caused by the A-bomb for the purpose of giving young people a fuller sense of the post-war experience. These programs eventually were transformed integrating time for games, swimming, crafts and exploration of nature to allow both for an experience of the struggle of those times and for joyful learning. This approach engaged a wider range of intelligences (Chen, Moran & Gardner, 2009) in students while exploring not only the traumatic past but also opportunities for positive futures.

Mister Suigera noted that many peace educators in Hiroshima have worked with American educators for the purpose of reconciliation including explorations of arts and peace as well as ongoing discussions about the effects of the A-bomb. The Peace Cranes project for example involves schools around the world that work together in clusters to fold 1,000 origami cranes which are then sent to the Mayor of Hiroshima and often used to promote dialogue on the subject of nuclear disarmament.⁴⁶ Suigera explains that with the Internet, schools in Hiroshima

⁴⁶ Peace cranes are sent by children participating in these programs to the Hiroshima Children's Peace Monument

are now able to link with schools abroad in real time discussions about peace related issues, a prospect that was far more difficult a decade ago. This is helpful as they place great value on international exchange and given that financial support for peace education has been on the decline in Japan, communication technology allows them to do more with less funding.⁴⁷

Viewed through a complexity lens, the above themes represent key bifurcations that these educators framed as important opportunities for emergent change and that can be analyzed here as a way for understanding the potential for complexity-inspired education. Matsui's case is especially illustrative, and will be the focus of analysis for the remainder of this section. Matsui expressed his own understanding of the evolution of peace education pedagogy emphasizing that within contemporary efforts "the teacher wants them (students) to go outside and feel by (for) themselves." He went on to say, "It is important for students to identify problems and solve problems by themselves. I would say without intervention by the teacher." These pedagogical transformations included a transition away from standard instruction and toward a variety of inquiry-based approaches and applied field experiences that he incorporated into his approach over the past two decades. Mister Matsui now makes sure that the students he works with do "more and more field work" and he emphasizes the importance of using alternative educational spaces and of moving away from the classroom and into the community.

Matsui's students now go to The Peace Memorial Park⁴⁸ and gather data on the numbers of people visiting, where they are visiting from, and why they have come to the museum. He explains that students gain insights into the demographics of those interested in the A-bomb

from around the world. <http://www.city.hiroshima.lg.jp/shimin/heiwa/crane.html>

47 I also interviewed representatives from the Peace Boat. The Peace Boat offers another example of international outreach oriented education, as it originally was designed to bring people from Japan in meaningful and reconciliatory contact with neighboring countries especially those most directly affected by Japan's imperial past. <http://www.peaceboat.org/english/index.html>

museum and a deeper insight into why these people may be interested in peace related issues in the first place. This is exciting for the students as the museum draws people from around the world and their research allows them to engage with people who are from diverse backgrounds and a wide range of ages. They also encounter an array of perspectives on peace and begin to see how their research and their insights into the perspectives of others can help support the work of the peace museum and other peace-related organizations in Hiroshima. For example, they do so by sharing their data and impressions with the peace museum regarding participant experiences after visiting the museum and their reactions to exhibits, audio testimonials, and others.

In Matsui's view, it is not that the classroom need be abandoned because of opening up to other spaces and communities, but rather his view suggests that a more complex approach is needed, as he illuminates well when saying, "These days, students go out and research. Just lecturing them is not good enough." Mister Matsui has noticed that when students engage in fieldwork and reflection they remember these experiences and their findings and are more engaged in making new meaning together. He has observed that students get more from this approach than relying solely on lectures and highly prescriptive testing as students learn more as a result of actively engaging with peace-related themes because of their research, interviews and analysis. These results support his commitment to pedagogy that supports students in engaging outside of the classroom, and engaging with the larger community directly.

If we consider Matsui's orientation from the perspective of the edge of chaos, he has engaged in a dynamic balancing act between classroom structures and processes and the more chaotic forces outside the walls of the school. Instead of seeking consistency and control, which are so highly valued within mainstream reductionist approaches he identifies the dynamics at play in these larger systems as vital sources of energy that then invigorate the classroom

environment. Matsui's insistence on student engagement and responsiveness to context echoes complexity and education researchers Nadia Stoyanova Kennedy and David Kennedy's insights into creating open learning systems that are "contingent both upon the participation of each member and on communication within its environment" (Kennedy, 2010, p. 5).

Matsui like Suigera noted that these opportunities for encounter with environment extend beyond Hiroshima. Using information technology his students regularly make connections with people interested in issues of peace in other parts of the world and consider their views in relations to their own evolving understanding of peace. Their positionality within informationalized societies make outreach with others who shared such positionality relatively easy, as they have access to communication technology and high speed transport and share some similar cultural landscapes because of their encounters with the ubiquitous influence of corporate globalized media.

Matsui is excited by this development and is optimistic about what may result from international exchange around issues of peace and justice. He explains, "the world is becoming borderless, you can get information from anywhere" and he strongly believes that this flow of information has the potential to enrich peace education. Matsui clearly values these opportunities for students to have broader exposure to other people's perspectives because of this connectivity and he celebrates the possibilities that exist with increasing global connectivity. However, there was little evidence in our interview that he was able to problematize such encounters or explore the implications for his analysis of who does and does not have access to such informational flows.

Many of the points that Mister Matsui makes indicate a pedagogical commitment that is aligned with complexity theory. Mister Matsui has found that the quality and types of

interactions and the learning that can emerge inside the classroom is enriched, diversified, and strengthened when students return from the field. Though he does not overtly frame it this way, he takes an emergent approach to education, trusting intuitively that increasing feedback loops—by bringing students in contact with individuals and organizations that are engaging with peace related themes—will allow students to begin to see the issues they are focusing on in a broader context.

From within this view students see knowledge as more of a distributed phenomenon, as it emerges in a variety of circumstances, from encounters that exist inside and outside of the classroom and with other students, community members, international visitors and peace workers as well as with their teacher. It is not separate from selfhood but rather a continual emergent response constructed across multiple interconnected systems. Here Matsui echoes complexity researchers, Heeson Bai & Hartley Banack (2006) who argued, “we can perceive patterns that connect, not because there are pre-given patterns (“data”), or facts, but because we become part of, not apart from, emergent patterns of an integrated whole—a Gestalt. To know the pattern, one must be *part* of the pattern. Let this be called participatory knowing” (p. 13). Yet while Matsui emphasizes the influence of these varied experiences on the depths through which students internalize peace education knowledge, he did not indicate that he then reinforces this ‘learning about learning’ in a way that encourages the students explicitly to recognize the processes that create the conditions for these gains in knowledge.

While he does not cultivate such self-reflexivity, he is pleased with the results of the method he, his students, and the community have developed over the last five decades because he believes this approach breaks down the confinement of peace education as a theme that pertains only to school or exists outside of peoples lived experiences. Rather, Matsui adapts his

approach in part as a response to the reality that students understood peace education only within a closed system, as a game to be played and mastered for their own short-term gain with the classroom and school system and separate from any importance in their daily lives. The pedagogical diversity Matsui offers opportunities to broaden the educational processes associated with peace education and the spaces where students find the theme of peace relevant. Matsui's requests to engage with peace organizations, to do interviews on the street, to discuss these topics with family and friends blurs the line where learning about peace starts and ends and encourages students to engage a multiplicity of roles such as: researcher, classroom teacher, peace educator and advocate.

If Matsui were overtly drawing on a complexity approach to pedagogy then he may choose to focus on iteration in student research, to have students find ways to follow up with the people they encounter and to attempt to trace ways in which their perspectives are constantly changing and being changed by their experiences. He may choose to ask students how different understandings emerge in different moments and environments. This could support students in making connections between the local and the global, a point, which he suggests is important. In noting openness within and between systems and analyzing how feedback continually shifts, perspective students might see the complex convergence of factors that shift someone's point of view and the fluidity and contingency of knowledge production. This would support Matsui's goal of greater contextual awareness by providing conceptual language for students to see movement from the local to the global and back again. This could also support students in gleaning further insights into aspects of the global that impact on peace related issues in Hiroshima and to see ways in which local experiences and action influence the global and vice versa.

Peace Education Content in Hiroshima

Hiroshima presents a rich example of peace education praxis as the experience of such a devastating episode of violence gave way to a deep and profound commitment that such violence never happen again. As a result it possible to trace five decades of curriculum development in the city. Initially in Hiroshima, there was a focus on content that centered on direct contact with Habaksha - the survivors of the A-bomb, so that they could share their stories with students. While these Habaksha bring with them their experiences as survivors of one of the most horrific single acts of violence, they also could offer the full range of their lifelong experiences as members of the community. The stories of the a-bomb survivors as well as the commitment to disarmament, which grew there, initially formed the bedrock of peace education content in Hiroshima and it served as an example to educators and activists all over the world.

Yet even with such a strong historically grounded focus for peace education in Hiroshima, the curriculum there has undergone radical transformation in the past few decades. This has to do in large part with the loss of many of the generation that experienced the A-bomb and an emerging sense among educators of the need for a more complex approach to peace related issues. Mister Matsui explains this change, “we need to see it from a wider view, peace education used to mean (to us) no war, now it has changed, it means (we need to address) problems of poverty, environment, forest, pollution, etcetera.” Matsui is not the only one holding this view as the City’s approach to peace education curriculum has also changed during this time, with a move away from A-bomb and disarmament curriculum, toward interdisciplinary “guidelines” and a curricular menu approach with suggested peace education themes that include a myriad of global issues.

Matsui’s approach also is interdisciplinary as he focused on the relationship between

poverty, environmental degradation, conflict, and a host of other areas. He pointed out the benefits of an expanded sense of peace education as it provides opportunities to see patterns of exploitation/conflict/peacemaking in various contexts and to make broader connections across such diverse and interrelated areas of concern. He acknowledges that this curriculum better reflects the complexity of the world. However, he also joins several of the educators interviewed in expressing his concern that something has been lost in the meantime in Hiroshima.

These educators contend that the more complicated content has meant that the original focal point of peace education in Hiroshima has been diluted. Some peace educators worry that the experience of the A-bomb and the dangers of nuclear weapons and militarism are now being lost, and the local history and experiences of the realities of war along with it. Mister Suigera summarized his concern, “now people don’t even know the significance of the A-bomb (here).”

Because of expanding content areas in Hiroshima along with the loss of first-hand experience in relation to the A-bomb, these educators fear the commitment to disarmament may quickly be fading away. They lament that the original focus of peace education content might be lost in this attempt to deal with all aspects of ecological sustainability, conflict, and violence. This raises important questions for peace educators in Hiroshima⁴⁹ and other people interested in engaging with a more holistic and comprehensive view of peace education. Is it possible to engage with the full range of issues related to building peace without a superficial engagement with all of them? Has peace education content in Hiroshima grown more complex or just more complicated without greater understanding of the complexity of relationships between these varied thematic areas And in practical terms, how can all parties involved in educational

⁴⁹ It is important to note there are a host of factors that contribute to this concern that the emphasis on disarmament and the experiences of Habaksha are being lost. Understandably, the fact that many Habaksha are elderly or have already passed on is cause for concern among peace educators. As a result, there is a sense of urgency about how to solicit, preserve, and pass on their stories.

processes make sense of such disparate and far-reaching topics?

In the search for a more complex curriculum that engages with the dynamism of issues of peace and conflict educators in Hiroshima were left wondering about the best way to proceed. A complexity analytic suggests that increased pedagogical ‘complexity’ may just be complicated, adding more parts which are understood outside of dynamic relationship to each other.

Complexity seeks to understand within such curricular amalgams: what types of relationships exist between the many phenomena being studied? Where are their points of connection and how do these points of connection emerge and adapt? How might such patterns of relationship extend out beyond disciplinary boundaries within such curricular endeavors?

Complexity theory therefore offers ontological recommendations that prioritize relationships and pattern recognition thereby suggesting an analytical orientation that aims at making sense of the questions so acutely felt by these educators. Mister Matsui intuitively expresses a similar ontological desire in terms of recognizing a need for seeing connection across areas of inquiry within these broader content areas. He highlights the importance of analyzing the complexity of forces that converge in a moment of conflict and the localized and yet fluid and interconnected presence of peace processes that can respond to these situations. Matsui articulates the rich opportunities that emerged from this larger and more international sense of curricular boundaries mainly in terms of the opportunity to see connection across scale—to see the local in the global and the global in the local in terms of the resources at our disposal in response to challenging situations. This he makes clear when emphasizing “bullying is a form of war in the classroom” emphasizing that conflict patterns and dynamics share similarities across scales with conflicts in other places. Here he echoes Khrishnamurti’s sentiment “War is the bloody and spectacular projection of the violence of our everyday lives” (Krishnamurti, 1992, p.

115).

Mister Matsui's view shows an ontological resonance with a complexity view, for to think in these terms requires a peace paradigm where peace and conflict patterns are understood as interconnected across various nested social systems. They are both locally manifest with internal patterns of organization and globally fluid, and Matsui has a firsthand experience of this dynamism of 'glocal' interaction because of his experiences in Hiroshima, which has been at an international crossroads on experiments with both war and peace.

Mister Matsui not only has access to high-speed communication but to global communities of affinity and interest around the critical themes he and his students are exploring. Thus, he draws on these multiple opportunities for encounter both in their local context and in online spaces that shift the internal structure of their understanding and relationships. His positionality thus is central to his ontological orientation and complexity theory validates his understanding that such self-organization in response to complexity is not only possible but a potentially important generative source of learning and change over time. Lyubov Laroche, Cynthia Nicol and Jolie Mayer-Smith highlight the importance of this kind of self-organization in education arguing that it is at "the heart of the post-mechanistic approach(es) to epistemology and pedagogy" (2007).

Complexity theory in this case offers a framework for acknowledging that systems are dynamic, open, and interconnected and provides an analytical device, which both can affirm and critique Mister Matsui's experience of working within such complexity. Complexity also highlights the scope of the challenges he and the students are facing as these peacebuilding and conflict dynamics traverse various systems and therefore are not traced easily or manifest in ways that can be predicted through simple processes of analysis. Because these dynamics are

nonlinear, students are given a difficult task, to both observe and analyze conflict patterns within and across systems while also noting ways in which the convergence of factors can produce surprising results. Matsui continually struggles both to teach about global complexity (to develop curriculum that can grapple accurately with complex adaptive systems) and to develop pedagogy that is in accordance with complexity theory. When asked if he thought such complexity was a good or bad thing when compared to the earlier days in his teaching career where peace education was simpler, he simply smiled and said, “times change.”

While recognizing the shortcomings of curriculum, which has become complicated in Hiroshima, Matsui has maintained his ontological commitment to curriculum that seeks to grasp complexity. This has practical implications for peace educators as this differentiation between complicated in the sense of trying to cover all of the thematic territory and complex in terms of getting at adaptive system relationships can guide practice and help define problems. In terms of engaging with complexity, educators there could analyze the peace processes that existed in Hiroshima prior to, during, and after the dropping of the bomb and look to see how those forces have been influenced by and have influenced global actors. Recognizing nonlinear causality would allow them the ability to explore moments of convergence leading up to tipping points in relation to their work around disarmament issues, tracking for example the effects of such complexity on landmark treaties.

In their study of history they might note the convergence of factors that led up to the dropping of the atomic bomb from an interdisciplinary perspective, noting and analyzing environmental pressures and influences, international intervention and influences and times when small inputs resulted in large-scale changes. They may choose to focus on varied time-space scales, to look at how time changes in relation to moments of peace and violence,

compressing as a conflict escalates or dissipates. A complexity theory approach to the history of war (Delanda, 2000) would seek to illuminate the ways that systems exist in states far from equilibrium, and to analyze moments that affected tipping points in terms of the militarization of Japan and the US prior to the war.

Encounter-At the Intersection of the Global and Local

Mister Matsui is grounded in a hope for what can emerge from an exploration of common themes within peace education such as fellowship, reconciliation, and meaningful encounter across lines of difference. He believes humans can develop an expanded sense of consciousness from this exposure and his experiences in Hiroshima have reinforced his commitment to emergent and dynamic processes of learning that allow for movement between the local and global. In this way, he has faith in global connectivity's contribution to a transformation of consciousness. We can become "global humans or earth people" he says as he smiles, explaining that in the future we may be bound together more by our human identity and shared concern about issues than our national affiliation. In this way, Matsui joins other international educators who hold dear the potential that can be released because of increasing global connectivity (Boulding, 1998; Sandy and Perkins, 2002).

Matsui and other interviewees indicated that reconciling the Japanese relationship with its neighboring countries regarding Japan's role in World War II is an important element of peace education at home and abroad.⁵⁰ While their emerging praxis continues to emphasize relationship building, it also may minimize the difficulties of this history in light of a new more global narrative where such place-based history is viewed as less relevant. A case can be made that Japanese peace education has traditionally put a strong emphasis on disarmament and the

⁵⁰ For example, this theme of direct encounter and reconciliation was very much emphasized in my interviews with staff working for the Peace Boat Project in Japan.

seriousness of the atomic bomb, rather than highlighting the structural injustices and bellicosity of its own past and the relationship of these structures of thought to the present. This critique has been raised for decades by critics from neighboring countries (Kang, 2006). Further, Japan enjoys a privileged position within the global economic system and as Japanese peace education continues to widen its thematic focus to consider ecological and social justice issues it will be interesting to examine the degree to which educators there embrace a more critically self-reflexive view within this emerging curricular and pedagogical complexity.

After 30 years working in the field, Mister Matsui has great hope for what can result from meaningful encounters across lines of difference and for engaging in difficult conversations. He explains, “If we really know each other, have fellowship and relationship, if you (really) know me, we will never fight.” Matsui’s experience as an educator and his faith in the emergent processes that take place when there is a shared commitment to learning has given him a unique insight into the spaces where education and complexity meet. Matsui has seen in his own learning and the learning of his students that systems are open, interrelated, and co-evolving as the local and global are influenced and transformed continually by each other. In this, it seems that he and his students feel a sense of solidarity in striving for peace and an enchantment with the possibilities of encounter as they seek to learn across multiple spaces within their own city and virtually across great distances. This more fluid form of knowledge production was not possible given the ontological and pedagogical commitment of peace educators in Hiroshima. However, over time this desire to create systems of education that are more open was echoed by educators in Hiroshima and Tokyo.

These efforts to amplify knowledge production within and between various learning locales and through multiple pedagogical methodologies was a trend that appeared not only in

Japan but in the data in the US as well. The next section explores several interviewees from the U.S. and their efforts to respond to increasing complexity. It also examines the pedagogical and curricular demands of such endeavors while exploring the ontological insights of these educators in their attempts to build alternative praxis both outside of and within public schools.

Teaching Peace in the United States

The field of peace education has developed in the United States over the past century (Stomfay-Stit, 2008). According to Aline M. Stomfay-Stitz (2008) during the violence and social upheaval of the 1960s in the US, peace education became an established and more widely recognized discipline. She writes, “several organizations played a vital role in this shift. The Peace Education Commission (PEC), a network of elementary and secondary teachers interested in promoting peace education, became a part of the International Peace Education Research Association (IPRA)” (Stomfay-Stit, 2008, p. 4). Since that time, peace education has become an increasingly complex curricular and pedagogical terrain growing from a primary emphasis on conflict resolution, multiculturalism, and international issues of war and peace to include a focus on ecological sustainability and conceptions of globalization (Reardon, 1994, 2001; Harris & Morrison, 2003).

In the United States, I spent one month interviewing eight peace educators in the state of California. I choose California because of its reputation as a location for social and technological innovation and as a locale where complexity theory is more widely discussed in educational circles. Regarding the demographics of the interviewees, while I did not ask participants either their race or political affiliations, of those interviewed, the majority of interviewees appeared to be white with the exception of three educators. While none of the organizations claimed political

affiliation, I interpreted their positionality within the US political spectrum to be progressive.⁵¹ All of these educators were introduced to me through professional connections within the field of peace education, which generally is associated with progressive ideals. My stay in the U.S. was relatively short and I was far more familiar with the peace educational context in the U.S. because of my situated reality having lived the majority of life there and working as a peace educator for over a decade. As a result, my interviews with peace educators in the US focused more on their projects and ontological journey rather than the cultural terrain in which they made meaning of their work.

This section analyzes some of the ways in which contemporary peace educators in the US take up the creative struggle to develop approaches that match the complex demands of the contexts in which they are situated. From schools in urban spaces in the San Francisco bay area that seek to use the garden, kitchen and lunchroom as ‘classrooms,’ to efforts by outdoor educators to creatively engage with ethnic, racial and socio-economic differences educators in the US are being pushed toward the edge of chaos in novel ways. This section will examine the ways in which two organizations; The Center for Ecoliteracy and the Mosaic Project attempt to engage with complexity. The Center for Ecoliteracy offers a novel opportunity to analyze an educational organization that explicitly attempts to operationalize the ontological insights of complexity whereas the Mosaic Project does not overtly employ the theoretical commitments of complexity yet seeks to respond to such demands.

The Center for Ecoliteracy’s Rethinking School Lunch Program

Fritjof Capra is an intellectual leader and bestselling author in the field of complexity theory. He is also the founder of the Center for Ecoliteracy (CEL) an educational organization

⁵¹ I have no way of overtly knowing their political views; however, my assumptions are based on a set of social cues, which I am familiar with as I have lived the majority of my life in the US.

“dedicated to education for sustainable living.”⁵² This section examines one of the Center for Ecoliteracy’s main projects, the Rethinking School Lunch program (RSL). RSL is a comprehensive program that seeks to enliven curriculum content about eating healthy and to support students and staff in understanding social and ecological systems better. While under development for more than a decade, in 2004 CEL launched their pilot project in the Berkley Unified School District (BUSD) in Northern California.

The Berkley Unified School District is an ethnically and racially diverse school district with African American students comprising 24%, Latinos 21.4% and white students 31% of the pupils in the district.⁵³ The district has a total student population of over 9,000 students with roughly 6,000 pupils attending the elementary and middle schools where the CEL is currently working. The RSL seeks to influence student knowledge about “nutrition, food and the environment”⁵⁴ and the program employs both traditional and alternative pedagogical approaches and spaces in their attempts to engage learners from diverse backgrounds. This includes experiential learning activities such as students cooking in the school kitchen as well as working in onsite gardens. In addition to curricular and pedagogical support from the center to implement the RSL curriculum, the program often includes upgrading school kitchens to handle fresh food better so that meals can be made from scratch and students can participate in making them.⁵⁵

CEL’s work provides a rare opportunity to analyze a project that overtly uses complexity theory as the theoretical foundation for whole school change in relation to the themes highlighted

⁵² <http://www.ecoliteracy.org/>

⁵³ For a full demographic report visit: <http://www.ed-data.k12.ca.us/Navigation/fsTwoPanel.asp?bottom=/profile.asp%3Flevel%3D06%26reportnumber%3D16%26fyr%3Dcurrent%26tab%3D0>

⁵⁴ An Evaluation of the school lunch initiative can be found http://cwh.berkeley.edu/sites/default/files/primary_pdfs/An_Evaluation_of_the_School_Lunch_Initiative_Final%20Report_9.22.10.pdf

⁵⁵ <http://www.ers.usda.gov/AmberWaves/September08/Features/BalancingNSLP.htm>

above. Stephen Rutherford a teacher of 25 years who is working with CEL to implement RSL explains why an environmentally-oriented organization committed to understanding complex adaptive systems chose food as their focus within urban schools. According to Stephen, “one of the most profound connections we have to nature is through food” and he noted that the everyday experience of food in young people’s lives and food’s connection to multiple interrelated and complex social and ecological systems means that it can be a powerful curricular thread through which systems understanding can be experientially explored.

CEL’s approach is ambitious, as they have developed a curriculum seeking to bring the theme of ‘ecoliteracy’ into the mainstream curriculum of the district through an exploration of healthy food in elementary and middle schools. The term ecoliteracy is a broad concept that was coined by author and educator David Orr and Fritjof Capra in the 1990’s (Sterling, 2003). Capra explains:

The great challenge of our time is to build and nurture sustainable communities—communities that are designed in such a way that their ways of life, businesses, economies, physical structures, and technologies do not interfere with nature’s inherent ability to sustain life. The first step in this endeavor is to understand the principles of organization that ecosystems have developed to sustain the web of life. This understanding is what we call ecological literacy.⁵⁶

CEL is working to bring the theme of ecoliteracy into all major subject areas of classroom study in the Berkeley schools including science, history, social sciences, and health. They also are working to expand the pedagogical practices used in the schools by supported staff in developing methodologies for using the lunchroom, kitchen, and the garden as ‘classroom’ spaces for learning about food and systemic relationships.⁵⁷ The work that takes place in those alternative educational spaces is an integral part of the RSL program and as a result, kitchen, lunchroom,

⁵⁶ Center for Ecoliteracy website: <http://www.21stcenturyschools.com/Literacies/Ecoliteracy.htm>

⁵⁷ http://cwh.berkeley.edu/sites/default/files/primary_pdfs/An_Evaluation_of_the_School_Lunch_Initiative_Final%20Report_9.22.10.pdf

janitorial and garden staff are integrated into the RSL teaching teams.

CEL began their efforts to mainstream ecological content by reviewing the California state standards and attempting to design curriculum that was resonant with the ontological insights of complexity theory and met these broad state mandates. The designers contended that their curriculum could use food as a thematic thread for making the standards more relevant in each subject area thus hoping to support teachers in meeting requirements while exploring complexity. In reviewing the standards and creating the curriculum Mister Rutherford explains that the members of CEL's team continually asked, "what connection does this (standard) have to human knowledge?" He went on to emphasize the importance of continually returning to this question arguing that the state standards are often so broad and abstract that they "have no meaning for children" and present a challenge to teachers who are responsible for making such knowledge applicable to students' lives.

The Rethinking School Lunch program is not the first attempt to implement a garden and food program in the Berkeley Unified School District. In 1995, well-known chef Alice Waters and Martin Luther King Middle School Principal Neil Smith worked with community members and school staff to begin the process of planning the Edible Schoolyard (ESY) program.⁵⁸ In the years following, the Edible School Yard (ESY) program grew to include school gardens, after school cooking classes, school recycling, composting programs and a host of other food and community building projects. RSL worked to build on this legacy and according to Mister Rutherford made a concerted effort to learn from the successes and failures of its predecessor (ESY) and Alice Waters remains involved with both the ESY and RSL programs.

During my interview with Stephen he made clear his admiration for the ESY's

⁵⁸ <http://www.edibleschoolyard.org/history>

programming highlighting how it provided an innovative garden to table program in the schools the scale of which had not been accomplished in that area before. He contends that it deeply affected students' sense of connection to both physical place and each other. However, according to Stephen, the system effects of ESY's work and the depths of learning for students were limited as it was seen as a 'parallel stream' and therefore did not "successfully engage teachers in the classroom" or enter the formal curriculum. He explains that in RSL they wanted to go further as they increasingly came to see that the curriculum needed to be integrated into classroom study.

The Rethinking School Lunch program grew from this initial desire and challenge to bring ecoliteracy into the mainstream life of the schools. CEL, contends that the integration of ecoliteracy over time requires more than altering curriculum, as it also demands transforming educational spaces, practices, eventually the school culture, and the ontological orientation of participants toward complexity. CEL's approach therefore provides a valuable opportunity to examine educational praxis informed by complexity theory and the challenges and opportunities of generating both curricular materials and pedagogical approaches that seek to engage with complexity.

Overview of CEL's use of Complexity Theory as a Guide for Educational Design

The holistic educational change that CEL seeks to generate is underpinned by their commitment to guiding principles that are informed by complexity theory. CEL maintains that when these principles are applied to education they can have profound implications for both pedagogy and content. According to Fritjof Capra, the essence of these principles can be explained as "thinking in terms of relationships, connectedness, and context."⁵⁹ These principles

⁵⁹Center for Ecoliteracy Website: <http://www.ecoliteracy.org/nature-our-teacher/systems-thinking>

are meant to guide curricula away from approaches which are either overly simplistic or become more complicated without yielding insight into the workings of complex adaptive systems.

Rather, CEL attempts to support those involved with RSL in new ways of thinking about systemic relationships by providing explicit conceptual resources and guiding principles with which educators can work.

CEL maintains that taking these principles onboard “requires several shifts in perception, which lead in turn to different ways to teach, and...to organize society.” The center has identified six key concepts emerging from complexity theory, which they use to generate curriculum, and guide pedagogical transformation and organizational change. These shifts in educational philosophy are described by CEL as ‘shifts of perception’ from: 1) parts to the whole; 2) objects to relationships; 3) objective knowledge to contextual knowledge; 4) quantity to quality; 5) structures to process; and 6) content to patterns.

Before examining the various ways in which CEL tries to build curriculum that embeds these insights in their praxis, it is helpful to review the rationale they cite for each of these changes as it gives deeper insight into the ontological vision that guides their work. In terms of the shift from *parts to the whole*, CEL claims, “with any system, the whole is different from the sum of the individual parts. By shifting focus from the parts to the whole, we can better grasp the connections between the different elements.”⁶⁰ CEL sees this analytical engagement with interconnectivity as central to cultivating Ecoliteracy and effectively designing educational programming.

In the RSL, project teachers maintain “an ecosystem is not just a collection of species,

⁶⁰ Ibid

but is a community.”⁶¹ Thus CEL emphasizes the need to shift perceptions from objects to relationships for better understanding the dynamics of these communities. According to CEL, “communities, whether ecosystems or human systems, are made up of sets, or networks, of relationships.”⁶² This ontological orientation in education demands that the quality, intensity, and forms of interactions within networks and systems be a primary focus of analysis and CEL sided with complexity educators (Doll et al., 2006) in noting a tendency within contemporary educational practices for privileging analysis of atomized phenomena.

CEL’s third principle highlights a shift away from objective knowledge toward contextual knowledge and they seek to couple complexity and environmental thinking contending “explaining things in terms of their contexts means explaining them in terms of their environments.” CEL thus makes the claim that “all systems thinking is environmental thinking”⁶³ as phenomena cannot be fully understood out of context. CEL stresses that systems are interconnected and nested within other systems. This is not a novel insight as the importance of recognizing nested systems is echoed throughout the complexity and education literature (Davis & Sumar, 2008; Fenwick, 2010) and underscores the significance of examining context when seeking to analyze complexity in educational curricula.⁶⁴

The fifth principle CEL highlights is a move from analysis of quantity to quality. They contend that Modern Western scientific has a bias toward that which is quantifiable, which often undermines systemic understanding as many processes and objects of study may not lend themselves to such methods of analysis. According to CEL:

⁶¹ Ibid

⁶² Ibid

⁶³ Ibid

⁶⁴ Chapter 2 of this dissertation explored at length the paradigmatic implications of reductionist thinking and the social influence on the rise of mass education, which generally devalued the importance of specific context.

it has sometimes been implied that phenomena that can be measured and quantified are more important—and perhaps even that what cannot be measured and quantified doesn't exist at all. Relationships and context, however, cannot be put on a scale or measured with a ruler.⁶⁵

CEL contends then that education should focus on both qualitative and quantitative analysis.

Similarly, they maintain that contemporary analysis tends toward an analysis of enduring material structures and they advocate for a shift from an examining of *structures to processes*.

While CEL recognizes the importance of examining material structures and makes room for that in their educational programs they maintain that they are given ontological priority and thus often undervalue the dynamic processes and change at play in complex adaptive systems. CEL argued, “living systems develop and evolve. Therefore, understanding them requires understanding renewal, change, and transformation.”⁶⁶ They contend then that focusing on these fluid processes and seeing them at work in various environments is central to a complex curriculum, which can illuminate the way such patterning is constantly interacting and changing.

Finally, CEL maintains that complexity-inspired educators need to shift their focus from isolated content to patterns. While focusing on individual processes is important, it is the emergence of patterns and the influences on and effects of those patterns over time that animate transform, grow and atrophy within systems. CEL explains “instead of focusing on what a living system is made of, we study its patterns. This shift leads to discovering that understanding how a pattern works in one natural or social system helps us to understand other systems that manifest the same pattern.”⁶⁷

The guiding principles highlighted above inform CEL's work and lend some insight into the ontological lens that guides the Rethinking School Lunch project. CEL provides a rare

⁶⁵ Ibid

⁶⁶ Ibid

⁶⁷ Ibid

opportunity to examine educational praxis that is informed explicitly by analytical insights from complexity theory. However, RSL is not merely an attempt to make explicit the conceptual terrain of complexity in education but rather to generate an educational model that supports those involved in public education with the creative and analytical tools for responding to complexity. The next three sections are an examination of CEL's attempts to embed these ontological insights into their pedagogical and curricular strategies in the BUSD.

Experiential Learning and Complexity-inspired Curriculum

CEL's educational model is ambitious, in that it seeks to support learners by generating curricular materials that teach about complexity while also supporting educators in utilizing pedagogical approaches that are in accordance with insights from complexity theory. While these two domains of pedagogy and content are often viewed separately from each other, staff members at the CEL maintain both play a mutually catalytic role in generating emergent praxis that supports ecoliteracy. This section begins as an examination of how CEL tries to enroll students in engaging with complexity through their curriculum. It then moves on to a consideration of how that curriculum is embedded within a complex pedagogical approach that seeks to create multiple opportunities and sites for learning.

The RSL curriculum uses the idea of 'foodwebs' as a central organizing concept through which they seek to illuminate complexity in their curriculum. By focusing on the idea of 'webs' as a conceptual anchor point, the RSL curriculum attempts to challenge participants to think in terms of various sets of relationships and patterns. These webs are then examined and contextualized across disciplinary boundaries, as students examine systemic dynamics that manifest because of geological, cultural, historical, and international influences on the foodwebs and larger ecosystems of which they are a part.

CEL has generated extensive curriculum materials and they offer suggested activities, lesson plans, and resources for science, math, history, and health teachers. To help with curricular integration, CEL provides guiding questions and lesson plans meant to support learners in deepening their understanding of dynamic systems and making meaning of the experiences they are having as part of their ‘hands-on’ activities in the lunchroom, kitchen and classroom. The questions in the chart below illuminate some of the ways in which the RSL program frames their inquiry and the types of prompts they use during experiential activities to guide students in critically observing systemic relationships and social and ecological change over time. This series of example questions and activities is drawn from CEL’s literature for middle schools,⁶⁸ and highlights some of the ways that the RSL curriculum has attempted to bring complexity concepts down to earth.

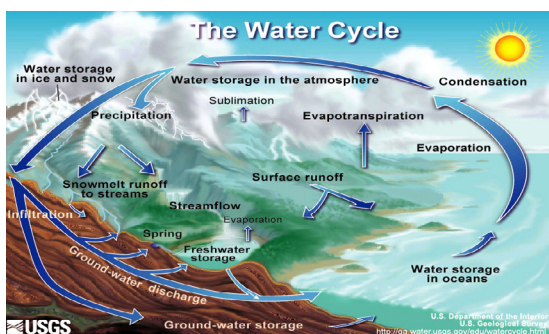
⁶⁸ *ibid*

Example Questions for Science Classes	Example Questions for Health Classes	Example Questions for History/Social Science
What is energy?	Throughout history, what effects have activities had on natural systems?	In what ways are human, health and environment related?
Where do living organisms get their food?	Have human activities affected energy relationships in natural systems?	How do behavior patterns and food choices affect the health of the human body system?
How might we investigate the flow of energy in an ecosystem?	What is the relationship between culture and food webs?	How do behavior patterns and food choices affect the health of the environment?
What would life on Earth be like without decomposers, scavengers and detritivores?		
Example Activities in the School Garden	Example Activities Kitchen Classroom and School Lunchroom	
Observe different food webs in the garden	Describe a food web of which you are a part using food from the day's lunch as a starting point.	
Keep records over time to investigate the effects of seasonal changes on food webs.	Observe record, graph and display data related to the amount of waste that you generate in the kitchen classroom and the school lunchroom.	

RSL's curriculum is designed to raise questions and offer activities that encourage students to think about food in larger systemic contexts. The questions above are accompanied by curricular resources that show visual depictions of ecological and food systems and the way that processes play out within and between those systems. According to Mister Rutherford, student typically think of food in a highly compartmentalized way, as the 'stuff you get at the store' or simply 'buy at a restaurant,' with little thought of where it comes from, how it effects

one's health, and how it is connected to larger ecological and social systems. CEL seeks to (re)present food as embedded within multiple complex and interconnected systems and for students to examine where they are located within these systems and how they influence them.

Curricular integration is aided by curricular materials that support learners in understanding how their direct observation and experiences connect to larger patterns and processes. For examples, while students may observe the water cycle in the garden noting things such as rainwater catchment, watering practices, and evaporation, CEL's curriculum provides opportunities to explore how those processes connect to larger weather systems such as the one depicted below.



CEL frequently offers graphic models that depict the process that students are studying and observing outside of the classroom in relation to larger systems of which those processes are a part. This provides a growing body of knowledge that allow teachers to make the curriculum more complex by exploring multiple points of connection between material and social systems and how they mutually influence each other. This way of representing the world differs greatly from the simplification of phenomena advocated for by Peter Ramus, which so profoundly influenced mass education in Europe and later in the US (Doll, 2005). As examined in chapter two, such efforts at simplifying the world required moving from universals to particulars in a way that isolated phenomena into 'intelligible' and atomized pieces and greatly oversimplified

systemic relationships.

While such reductionist practices can play a role in offering learners an understanding of the parts and pieces of more complex phenomena, they often fall short of reconstructing the world in ways that make sense of complex relationships and processes. CEL's curriculum on the other hand seeks to introduce learners to a new descriptive language—the language of complexity and systems theory by focusing on dynamic relationships and processes of change. Complexity researchers Nadia Stoyanova Kennedy and David Kennedy point out that such changes in language are significant as “human social systems are networks of coordinated actions in language—they are networks of diverse conversations. Change in a social system is realized as conversational change; that is, it occurred through ‘languaging’” (Kennedy & Kennedy, 2010, p. 6). The RSL curriculum supports these discursive changes by introducing concepts like hybridity and fluidity within and between systems challenging students to observe and map the flow of energy in nature (including food as a critical part of that flow) while also asking them to consider the ways the human health and environment are interrelated.

As a result of this interdisciplinary curriculum that attempts to reconstruct complexity students are continually challenged to examine the relationships within and between ‘natural’ and ‘social’ systems over time and to engage with the descriptive explanatory terrain of complexity theory in the process. The RSL curriculum challenges students to move toward more higher order thinking in terms of examining dynamic sets of relationships that often have elements of hybridity and fluidity and where separability is increasingly challenged over time. CEL's curriculum seeks to make accessible advanced concepts that are often difficult to attempt to convey to young children, like systems, food webs and complex patterns. However, as Mister Rutherford pointed out, it is difficult successfully to engage learners in understanding such

complexity through curricular means without the assistance of pedagogical approaches that can effectively enliven this content in a way that changes students' sense of themselves and the world. He noted that early attempts to do so did not work, as these concepts were difficult to grasp especially when taught through didactic means. In response, CEL developed a wide array of pedagogical approaches and moved away from didactic models and toward project-based learning and experiential approaches.

Complexity-inspired Pedagogy

CEL's approach involves diversifying traditional pedagogical spaces in schools and creating more opportunities for hands-on learning. At the core of CEL's approach is an attempt to integrate academics, with what they refer to as the garden and kitchen 'classrooms.' When working in the garden students engage in all aspects of growing food including planning, planting, nurturing, and harvesting plants. They study the plants they work with including their growth cycles and their relationships with other plants, animals, and bugs. They also focus on the water and waste cycles working with compost and water catchment systems as well as observing natural water flow within ecological and weather systems. Additionally, they regularly work in the kitchen classroom, learning new recipes, preparing food, and monitoring waste as well as conducting social scientific analysis of people's attitudes and behavior toward food. CEL consider the lunchroom a primary pedagogical space as students are asked to notice how and what they choose to eat and to examine what contributes to those choices for themselves and others.

The alternative pedagogical spaces provide rich environments for collective action, as there are many opportunities in both the kitchen and garden for students and staff to work together. CEL's work in the garden and kitchen classrooms continually calls for teamwork and

collective problems solving. This methodology is in keeping with the insights of complexity and education, which seek to improve on mechanistic approaches that wrongfully “presume that the individual is the locus of the educational process” (Seltzer-Kelly et al., 2011, p.13). Where students are accustomed to individual work in the traditional classroom, there is a sense of expanded pedagogical possibility in terms of the processes that can take place outside of that space. For example, students frequently engage in individual observation of plants, noting the rate of growth or changes in plant health-based on changes in the larger environment. However, in the kitchen and garden they work together to corroborate views, discuss differences and examine methodological issues that may influence their findings. They are then continually asked to relate what they are observing, discussing and debating to the themes, conceptual models, and questions being discussed in class. This allows for the scaffolding of conceptual knowledge over time.⁶⁹

As Nadia and David Kennedy (2010) explain the scaffolding of knowledge:

functions through subprocesses such as clarification, reformulation, summarization, and explanation, as well as through challenge and disagreement. The problematization, deconstruction and reconstruction of a concept—“conflict” for example—proceed by following the inquiry where it leads through a communal process of posing questions, exploring alternatives and hypotheses, asking for evidence, criteria and reasons, connecting and distinguishing ideas, and drawing temporary conclusions. (p. 4)

CEL’s curriculum questions (highlighted above) and the pedagogy they use allow multiple opportunities for the “subprocesses” described above to take place in relation to the theme of ecoliteracy and provide a window into how complexity theory concepts can be applied to shape curriculum and aid in question formulation.

⁶⁹ Scaffolding is a term popularly used in education to refer to the building of more complex conceptual knowledge over an iterative process. It was worked out by Lev Vygotsky when he put forward his theory of the Zone of Proximal Development. Berk, L & Winsler, A. (1995). “Vygotsky: His life and works” and “Vygotsky’s approach to development.” In *Scaffolding children’s learning: Vygotsky and early childhood learning*. National Association for the Education Of Young Children. pp. 25-34.

Complexity researcher and educator Perrin Blackman noted that in seeking to make accessible these advanced concepts and dynamics that are challenging to comprehend, “simple repetition is not sufficient if it occurs without context” that is relevant to learners (Blackman, 2008, p. 21). CEL’s approach is significant from a complexity theory point of view as it deepens student’s sense of connection to context by initiating experiential activities, utilizing alternative educational spaces and generating opportunities for reflection and analysis through dialogue. Those conversations happen between members of the learning community but also in response to the systems inspired curricular materials that CEL has generated in collaboration with teachers. According to an evaluation of the school lunch initiative conducted by researcher at the university of California Berkeley, the success of the achieving RSL’s goal of influencing a “broader understanding of the importance of sustainable food systems” and “healthy human communities”⁷⁰ within schools was largely dependent on this integration of curricular themes with pedagogical diversity.

While CEL has developed a robust program aimed at improving on the shortcomings of their predecessors like the ESY by seeking greater curricular integration with experiential learning, implementation of those goals are challenging to achieve in practice. In UC Berkeley’s evaluation of the project they note specifically in relation to the curriculum integration component that while it “had some successes” it “was not developed fully by the third year of the evaluation” (Blackman, 2008, p. 21). Further, they observed a high degree of variable in relation to how the curriculum and RSL pedagogical program were implemented in different schools (Blackman, 2008). They noted, that while “integration across academics, gardens, cooking, dining, and school meals did occur in the middle school with the most highly developed School

⁷⁰ An evaluation of the school lunch initiative: Final report, p. 6.
http://www.ecoliteracy.org/sites/default/files/sli_eval_full_report_2010.pdf

Lunch Initiative components” such interdisciplinary curricular integration was not achieved to such a high degree in other schools.

CEL’s curriculum is demanding for teachers to implement in their classroom with ideas of interconnectivity, mutual influence, and dynamism across multiple systems nuanced throughout their materials. Further, the successful integration of the curriculum is highly dependent on the quality of experiences and methodologies for integrating experiential learning into the classroom, kitchen, lunchroom, and garden. In this way, UC Berkley’s research suggests that curriculum and pedagogy, context and participation all create a complex set of overlapping influences that supporting students and staff in deepening their understanding of complexity and that if any of these pathways for feedback is inhibited then student comprehension suffers.

In all, CEL attempts to create a learning community that acknowledges that both the staff and students play an integral role in emergent learning and that such encounters are made possible through constantly changing dynamic relationships that differ greatly from mainstream educations commitments to control predictability and replication. In the RSL program both students and staff members are asked to reach out across lines of difference and learn and work together in new ways and in highly varied spaces. CEL’s Rethinking School Lunch Program strives to catalyze learning by generating pedagogy, which seeks to cultivate epistemic diversity through interactive processes and curricula that highlights systemic relationships in an interdisciplinary fashion. CEL’s goal is to effect larger, albeit unpredictable change, recognizing that “the nature and quality of what students learn is strongly affected by the culture of the whole school, not just the individual classroom.”⁷¹ CEL’s approach to implementing the RSL project is complex and the RSL program provides a valuable example of complexity-inspired praxis. It is

⁷¹ Center for Ecoliteracy website: <http://www.ecoliteracy.org/>

therefore necessary to further examine CEL's theory of change and the challenges and opportunities of implementing this ambitious educational project, which seeks to not only, influence change with the classes whom they are working with directly but within the whole school and throughout the district.

Working Toward Whole School Change

The CEL's RSL program is attempting to achieve the complexity aim of maximum creativity and innovation with a minimum amount of input in their approach to whole school change. This theory of change is informed by complexity theory and a sense of non-linear causality that makes possible large-scale changes because of small inputs. Further, they recognize that educational systems are open and interconnected and that as a result changes in one part of a system can migrate and influence change in other places, albeit those changes may be unpredictable. They seek to generate these catalytic forces by supporting what they call Strong School Teams (SST) at each of the schools they are working within the district. These teams include administrators, teachers, garden and kitchen staff and they meet regularly to discuss a range of topics ranging from logistical challenges, which arise in the process of implementing the RSL program to best practices emerging from their work in their respective domains. SSTs are small groups usually with six or seven people on a team.

Classroom teachers who are members of the SST's begin to work with staff from the garden, kitchen and lunchroom before students get involved in the RSL project. All of these parties are expected to offer guidance to students and help create a community of practice that engages with the curriculum. From CEL's perspective, for these diverse staff members to work most effectively together they must begin to see themselves as a part of a single team as well as belonging to their respective departments in the school. They are challenged as each of the

professions has their different cultures and process for getting things done and by the fact that these ‘teams’ have multiple constraints and other responsibilities. However, this is no small task asking kitchen and garden staff, administrators and teachers to work together across academic disciplines and varied spaces within the school.

The RSL program depends on successfully engaging staff from the garden, the kitchen, the administrative offices, and the classrooms. As highlighted above the RSL model depends on utilizing varied pedagogical spaces, diverse methodological approaches and a curriculum, which teaches about complexity. This novel approach requires the effective mobilization of intellectual and creative resources from people located within various part of the system that can draw from their respective areas of influence and share their situated knowledge. The healthy functioning of these Strong School Teams is essential to achieving CEL’s goals of generating pedagogy that is in keeping with ontological insight of complexity and curriculum, which can make such conceptual knowledge engaging.

While the SST are small they are drawn from distinctly different domains within each school and thus may have weak ties (Gladwell, 2002) with people at all levels of the system in that school and in the larger district. This then creates the possibility for a larger ripple effect from the project. The possibility of these larger changes is made more likely as the RSL teachers often come from different departmental⁷² backgrounds within the school and therefore are connected with the other teachers in their respective departments and in the larger district through various forms of connection including personal contacts and professional pathways such as district-wide professional development. Further, sometimes a single administrator interacts

⁷² I am using the word department here but this is not always the operational term used. Department refers here to groups of teachers working together within a school around shared thematic focus such as social studies, mathematics, or natural sciences.

with people in the head offices within the school and the garden and kitchen staff representatives with their respective teams.

Yet while the CEL's Strong School Teams approach seeks to establish the social patterning and 'connective tissue' for emergent change at a whole school level, it is difficult to assess the degree to which they are achieving their goals. Further, as the UC Berkley report indicates not all schools participating in RSL have been able to find the financial resources and social capital for implementing the SSTs model. However, Mister Rutherford pointed out that they are still in the early phases of development and that generating the sense of community needed for this kind of collaboration to take place takes time. According to Rutherford, the centers work is already beginning to pay off as he explains that students, teachers, administration, parents, and community members are beginning to form themselves "as a learning community-based on the deep desire to have children learn our identified core curriculum."⁷³

Stephen's assertion about students learning was validated partially in 2010 by a team of researchers at the University of California at Berkeley's Center for Weight and Health published their evaluation of the program. They followed 238 students as they progressed from fourth and fifth grade into middle school during the years 2006 to 2009. According to the researchers the goal was "to determine the effects of the School Lunch Initiative on students' knowledge about nutrition, food, and the environment; attitudes toward healthy eating and environmental responsibility; and eating behaviors."⁷⁴ The researchers noted differences in implementation with

⁷³ This 'community' includes students, parents, community members, teaching and custodial staff, school as well as district administration.

⁷⁴ The final report

http://cwh.berkeley.edu/sites/default/files/primary_pdfs/An_Evaluation_of_the_School_Lunch_Initiative_Final%20Report_9.22.10.pdf, p. 9

more successful results coming from “highly developed programs” (which included garden, kitchen programs) as opposed to those with “lessor developed” programs (Atkins et al., 2010 p. 9).

The researchers concluded “the School Lunch Initiative is effective in increasing student nutrition knowledge, as well as preference for and consumption of healthy foods, particularly fruits and vegetables among elementary school students. Students’ attitudes about the taste and health value of school lunch improved as the changes were put into place.” (Atkins et al., 2010 p.3) While the researchers were able to determine broadly that schools with garden and kitchen programs elicited deeper change further research is needed to determine the complex influences that effected those changes. Further, due to the public health focus of this study, researchers did not asses CEL’s larger goals of promoting ecoliteracy and shifting the values and vision of the whole school community (e.g., parents, teachers, staff, Administration) about the purpose and possibilities of education.

CEL’s larger goal of influencing ecoliteracy presents challenges in terms of evaluation, as ecoliteracy is a holistic concept that is more difficult to assess then shifts in cognition in relation to student’s understanding of healthy food. Ecoliteracy requires evaluative measures that assess shifts in cognition in relation to students’ ontological sense of the world more broadly and their ethical relationship to economic, social, and political issues. As of yet CEL has not offered a comprehensive measures for assessing development across these areas.⁷⁵

Further, “whole schools” change in relation to the theme of ecoliteracy implies changes

⁷⁵ Studies of ecoliteracy have been examined from within the field of environmental studies. For example see: a cross-regional assessment of the factors affecting ecoliteracy: Implications for policy and practice Sarah Pilgrim, David Smith and Jules Pretty (DOI: 10.1890/06-1358.1), Dissertation Sustainable Development in Higher Education: Current Practice and Future Developments, Gerald Dawe, Rolf Jucker and Stephen Martin, critical pedagogy, ecoliteracy, and planetary crisis: The ecopedagogy movement Richard Kahn A Study of the Application of Critical Discourse Analysis to Ecolinguistics and the Teaching of Eco-Literacy Edward Haig

in attitudes and behavior not only in students but also in parents, teachers, administration and in the institutional practices of the schools. Complexity educator and researcher, Darren Stanley highlights the creative challenges of theorizing and assessing such change across multiple scales when he writes, “the central concern is for how individual and collective identities arise, how such identities are related, and how they change” (Stanley, 2009, p. 29). While CEL attempts to construct a program that can influence such far reaching changes in identity, and they attempt to seek feedback across various stakeholders they currently lack the evaluative methodologies to determine the extent of those complex changes to identity.

Moving from whole school change to district change and beyond

The difficulties of assessing educational transformation become even more challenging when attempting to examine CEL’s efforts at district level change. In terms of CEL’s efforts to inspire district-wide change, they offer an array of opportunities for members of SSTs from different schools to meet with each other and discuss pedagogical and curricular change. CEL devotes time and resources to finding ways for people involved in various aspects of the project to identify emerging best practices and to share that innovation with each other. They convene district-wide workshops and strategy meetings and offer a variety of cyber resources and communication tools aimed at greatly increasing the number opportunities for conversations between schools and with the Center and its stakeholders.

Stephen emphasizes the critical role that global connectivity plays in CEL’s approach to whole school and district-wide change. He contends that CEL has generated a “community based, web-based, professional development based approach that is rarely done in education and...cuts across schools.” CEL mainly focused on creating multiple feedback loops (opportunities for dialogue) analyzing the insights and challenges emerging from their work both

in terms of the pedagogy/curriculum and the realities of implementing their project on a whole school basis. In short, CEL intentionally worked to make sure there are opportunities for convergence across all the varied scales of organization throughout the district. However, these attempts at district-wide change are no small task especially in terms of shifting policies and structures as Stephen noted when he reflects “school districts are notoriously resistant to innovation.”

While a complexity analytic highlights the paradigmatic sources of such resistance to adaptation, it also contends that districts may not be as solid and stable as they appear and there is no shortage of research that highlights successful district-wide educational change efforts in North America.⁷⁶ Thus far, CEL has concerned itself mostly with increasing the points of influence within schools by bringing together staff from various departments (SST) whose social connections when looked at as a whole extend throughout the school due to the diversity of their positionality. In addition, CEL sought to create a host of dialogical spaces in which to garner feedback on the ways in which emergence is occurring across various scales simultaneously and to assess the sense of agency that people involved with the project are perceiving within these processes. This then creates the pathways for learning to flow between schools in the district as team members from individual schools learn what their colleagues at other schools are doing and the ontological insights emerging from the process. This work within and between schools demands a high degree of organizational complexity and CEL’s organizational resources have been fully mobilized toward this end of support emergent best practices in relation to teaching ecoliteracy.

⁷⁶For an overview of district-wide change in the US see: The School District Role in Educational Change: A Review of the Literature, Stephen E. Anderson, International Centre for Educational Change Ontario Institute for Studies in Education, August 2000.

As a result of this approach, CEL embodies a sensitivity to teaching on the edge of chaos as they must remain open to surprises in the development of novel praxis, (deGravelles, 2009) and yield centralized control of knowledge generating practices to more distributive approaches which sought to utilize insights emerging from within their network of practioners and allies (Kennedy & Kennedy, 2010). Chesters and Walsh point out that such efforts aimed at epistemic complexity are in keeping with some of the insights of complexity theory and what Massumi (2002, p. 255) called “symbiosis tending,” which can be understood as “the bringing together of diverse elements in ways which allow them to escape the reductive imposition of a unitary standpoint or identity” (Chesters, 2007, p. 13). As a result, Mister Rutherford and the staff at CEL do not claim to know the exact ways in which the RSL project will develop as their orientation toward educational change is informed in part by a sense of possibility because of operating within multiple open systems.

CEL’s theory of change appears to be grounded in an understanding that is resonant with complexity insofar as they are responding to the open and nonlinear nature of systems and working to support emergent learning because of the complex interactions within individual schools and between schools in the district. However, from within this view, change moves out into the larger world (from the school) and is influenced by other systems in ways that are unpredictable. Bai summarized the implications of this ontological view well,

We are living in a non-linear universe where uncertainties, surprises and creativity are determining conditions contained in, and emergent of, what has happened. Non-linearity is a property of an open system “far from equilibrium,” to use Priogine’s phrase, where contingency and instability characterize the predominant pattern (Bai, 2006, p.12).

When asked what Stephen thought about the transferability of CEL’S model to other places in terms of education systems in other parts of the US as well as abroad, he emphasizes that while CEL’s program may be of use to other people outside of the district but that, each

community has their own primary issues which they must address. While food was a central theme for CEL, Stephen highlights the need for self-determination in educational processes pointing toward local interest as a driver of change. Alternatively, he also stresses the need to share what people are learning as part of the RSL project. He explains “each community has values which are unique to them and yet we are all part of a global community and (so) we should share knowledge...of what we want children to have experience with.”

While CEL has made it a priority to support localized school-wide and district level change, they offer many of their resource materials and organizational models online for educators outside the district to work with and adapt as they see fit. While they are focusing locally in their work and emphasize the importance of local communities defining their own agendas, they go to great lengths to document their processes and make them available to their online community.

Through the distribution of articles through their publications portal on their website,⁷⁷ they offer a range of author reflections on their programs and the larger themes of ecological education with a systems orientation. CEL seeks then to amplify the effects of their own projects by disseminating these materials. Understanding that small system effects can migrate between systems that are on the edge of chaos, CEL seeks to multiply information pathways and opportunities for emergence at a district-wide level and beyond. Staff members at the Center for Ecoliteracy appear to have a sense that putting this material out there in the world will have unpredictable effects and they are less concerned with understanding the implication of such actions at this scale. Rather, when it comes to change beyond the boundaries of their school district the CEL was most interested in observing (when possible) the ways in which people

⁷⁷ <http://www.ecoliteracy.org/publications/essays>

innovate in response to their work rather than telling people how to use the material or seeking to effect specific types of change. CEL's interest in tracking change therefore seems to decrease as they move from micro to macro effects as they clearly expressed an interest in both influencing and trying to understand and track whole school and district-wide change.

The RSL program raises the overarching question, is it possible given such instability and emergent order that educational research can evaluate these changes to get a sense of if they are achieving their larger goals? While complexity undermines the possibilities for reliable predictions for the future within such complex systems, it does not dismiss the relevance of this question. Evaluation can lead to the identification of viable sources of energy within current projects and illuminate complex system dynamics that lead to change even if possible explanations may only be available after such changes have already taken place. CEL offers a range of pedagogical approaches and curricular materials designed to shift the ontological understanding of students and staff who are involved with RSL toward an orientation in keeping with complexity. Indeed this approach to weaving together ecological and social themes features a great deal of organizational complexity aimed at shifting the culture and orientation of public schools in the US. CEL illuminates multiple pathways for attempting to instigate change from within a complexity-inspired approach as they have increased pedagogical diversity, district-wide collaboration, curricular materials informed by complexity theory and the use of global connectivity for facilitating dialogue across multiple local and global communities of affinity and interest.

CEL does not endeavor to provide a unitary vision for education on the edge but rather a host of new spaces for people involved in schools to influence change and examine how that change is taking place over time. However, the analysis here suggests that whole schools change

is as of yet an under-theorized concept and that this engaged and self-reflexive approach is difficult to assess. CEL's assessment tools are ambitious and yet incomplete and it will be interesting to see if they become increasingly interested in also making the research component of their work more complex over time. Conversely, CEL seems primarily concerned at this point with implementation of their programs and inducing change through small consistent inputs into these schools that they believe may be on the edge of chaos. However, what such vulnerability means in practice, and how that will influence the manifestation of the kinds of changes that CEL is advocating for remains a largely unanswered question at this phase of implementation of RSL.

The Center for Ecoliteracy is not alone in their interest in shifting the culture, attitudes, and practices of schools toward social and ecological harmony through an approach in keeping with complexity. The Mosaic Project in Northern California has also generated a complex pedagogical terrain that weaves together both environmental and social justice themes. However, the Mosaic project unlike both Mister Matsui's peace education classes in Japan and RSL is focused primarily on educational experiences outside of formal school settings. It therefore offers a different model for educational change and a rich analytical opportunity to explore the challenges and possibilities of alternative educational spaces and approaches and efforts to translate those approaches to the formal school environment.

The Mosaic Project

The Mosaic Project was founded in 2000 by experiential educator Lara Mendel. Mosaic's mission according to Mendel is to "unite young children of diverse backgrounds, provide them with essential skills to thrive in an increasingly diverse society, and empower them to strive for peace." In 2001, Mosaic piloted their first residential Outdoor School where 4th and 5th grade

students of different class and racial backgrounds came together for a week to live and learn in the redwoods of Napa Valley, California in the US. Since that time, Mosaic has grown substantially and now offers 10 fall and spring Outdoor School sessions that serve roughly one thousand students annually from schools throughout California's San Francisco Bay Area.

Mosaic's primary mission is to challenge negative social stereotypes by creating deep and authentic encounters across lines of difference before intergroup hatred can solidify. Mosaic frames peace education in terms of supporting students in obtaining the skills to create inclusive and socially just communities. This section will examine Mosaic's pedagogical approach to building a more peaceful world. Mosaic provides a novel case for analysis as they have developed a pedagogically diverse array of methodologies, which integrate the arts as an approach to engaging with complexity. Further, they have developed an interdisciplinary curriculum that weaves together the themes of environmental stewardship, conflict resolution, and active community building in seeking to support students in facing the complex problems of the world with a greater sense of resourcefulness. Finally, Mosaic offers an opportunity to examine a program that takes place primarily outside of the formal school environment and invites assessment of the opportunities and challenges that exist within these informal educational spaces.

Each semester elementary school children (ages 9 and 10) make the journey from the city to the Mosaic Outdoor School. The campus is located in a wooded setting in the Napa region of California and is residential with students staying there for five-day sessions. Students are housed in single gender camp cabins with anywhere from 6 to 10 children from different schools intentionally mixed together. These students come to this unfamiliar place from both affluent and economically underprivileged schools. Where both Mister Matsui and the CEL use a problem

solving and experimental research-based approach in making their pedagogy more complex, Mosaic often uses the arts, particularly music and theater (role-play) to catalyze and diversify learning experiences.

Mosaic's activities are not limited to their residential program as they also provide a Youth Leadership Project, In School Workshops for grades K-8 and professional development trainings for schools and other organizations. This section primarily will examine the residential program and to a lesser extent the Mosaic's growing In-School Project. The Youth Leadership Project and professional development workshops that Mosaic conducts will not be examined.

The chart below provides a breakdown of Mosaic's efforts and the number of participant who are involved with each of their various programs.

Residential Program			Youth Leadership Project		In-School Programs		
Year	Sessions	Students	Schools	Teachers	Cabin Leaders	Schools	Programs
2001	2	76	0	0	4	1	0
2002	3	232	7	12	36	7	12
2003	4	272	9	15	52	8 ⁷⁸	19
2004	6	393	12	23	67	9	26
2005	9	686	17	30	88	10	28
2006	10	703	20	39	95	10	30

Mosaic prides itself on its diversity and the staff and students both come from diverse racial and ethnic backgrounds. The staff members also have a wide range of educational specialties within the field of experiential education. Some are musicians and artists who frequently teach, others are outdoor educators, diversity trainers and conflict resolution specialists. What is common is that they all draw on methodologies that are experiential and creative. The Mosaic team uses experiential activities that include; theater, interactive games, group challenges, nature exploration and as Medel emphasizes "music, music and more music."

⁷⁸This amended table, which does not include the statistics on Mosaic's Professional Development workshops, can be accessed at: <http://www.mosaicproject.org/history>

Mosaic's sessions are always jointly led by both male and female facilitators and high school students trained in experiential education and leadership strategies provide additional support by working with the students as 'peer educators.'

While Mosaic has a set curriculum and pedagogical processes that are well established for each of their sessions at the outdoor camp, the pedagogy is adapted continually by staff drawing on their specific skill sets. For example, some staff may include more role-play or games, where others will integrate certain styles of music or theater more heavily and their own insights on a specific theme. In this way, both the pedagogy and curriculum have some degree of flexibility and room for innovation over time. Lara noted that while the short-term changes are often subtle, the program has changed substantially from the initial pilot project because of the iteration of these changes over time.

While Mosaic's curriculum and pedagogy have grown more complex over time, it is guided by an explicit desire to support students in becoming peacemakers. They seek to achieve that goal by promoting self-esteem and assertiveness in responding to conflicts and reaching out across difference. Students are also encouraged to talk with each other in an honest way, and many of the experiential sessions are 'debriefed' with focused questions that students can personally reflect on, discuss in small groups or share seated in a circle with more group members present. The dialogical spaces are often prompted by activities that elicit strong embodied responses, as is the case for example when role-playing conflict situations from their own lives. These reenactments of real life experiences, as well as the simulations that Mosaic frequently uses are designed to make for more dynamic and relevant conversations about being empathic and assertive in the face of injustice.

While Mosaic's approach involves creating safe spaces to have difficult conversations

and even for students and staff to give each other challenging feedback it includes regular affirmation activities where children have opportunities to ‘lift each other up.’ Central to Mosaic’s approach are attempts to promote what is referred to in the popular educational research literature in the US as pro-social behavior (Barry & Wentzel, 2006). Mosaic staff members contend they have found a symbiotic relationship in merging the topics of diversity, conflict resolution, and environmental education in the field of peace education. Additionally, they seek to reap the pedagogical advantages of experiential education and of being outside of the classroom in engaging with these themes as students are brought to an alternative educational space where staff report students can more easily open up. Set free from the confines of their desks and the regularities of the school day, Mosaic strives then to challenge students to step out of their comfort zones and to seize opportunities to think and respond in new ways. In all, Mosaic attempts to employ a diverse pedagogical approach to teaching and an interdisciplinary curriculum focus on generating a transformative educational experience that can support students in exploring their agency within a complex world.

Mosaic-An Experiential Approach to Peace Education

The Mosaic Project provides a five-day experience that creates “a microcosm of the diverse, inclusive, just world we want to see” and they seek to “show...students that peace is possible.”⁷⁹ Mosaic is structured around a meta-theme that is explored in each of the five days that students are at the Outdoor School. Those themes include: 1) what is identity: who are we?; 2) appreciating diversity; 3) exploring interconnectivity; 4) dealing with conflict through assertiveness and creativity; and 5) the importance of reflection: who am I now, what have I learned, how I can be in community?

⁷⁹ From Mosaic Project: <http://www.mosaicproject.org/index.php>

Mosaic uses their arts integrated experiential pedagogy to spark thought and discussion on these curricular themes. They facilitate activities that generate concrete experiences, which are designed to make the themes of the day relevant to learners. After students engage in a facilitated educational experience that relates to the theme, they reflect on the experience they just had, abstract their learning and finally think of how it applies to their lives, communities and the larger world. While Mosaic's sequencing of activities and curricular materials are unique, the multi-stage approach to learning just highlighted above is common within experiential approaches and initially was articulated by David Kolb (1984).

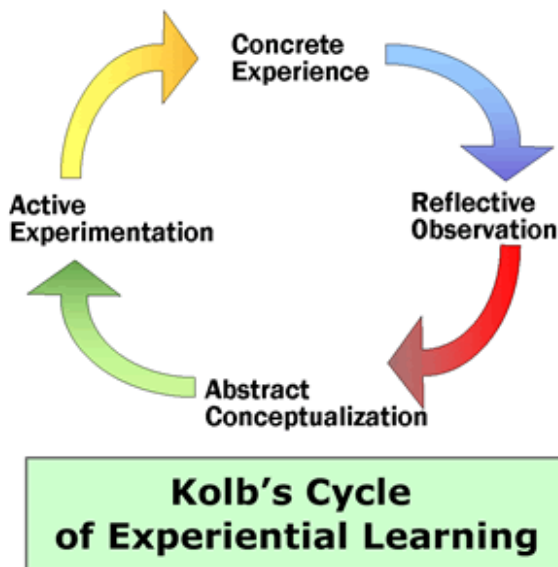


image by Karin Kirk 80

In terms of understanding mosaic's pedagogical approach it is useful to review some of the specific activities they draw on at the camp to examine how their approach seeks to engage with complexity through reflection on these themes and experiences. The section below provides a description of some of the consistent experiential activities that Mosaic uses and the themes they explore in those activities.

During the first day, Mosaic staff facilitate a well know educational game entitled where the wind blows that gives students a chance to continue to learn about each other in a safe and exciting way. In this activity, chairs are placed in a circle and a single person who is ‘the wind’ stands in the center and repeats the statement the wind blows _____ filling in the blank with something that is true about themselves. For example, someone may say, “the wind blows people with red shoes, or people who love to play sports or people who have lost close friends.” Everyone else for whom that is true must get up and scramble to find a new seat. Where this game can be used as a safe icebreaker with students scrambling based on if they are wearing red shoes it can also be used to illuminate deeper aspects of identity such as if students have any friends of a different race or ethnic background or if English is the their second language, if they have ever traveled abroad or lost someone close to them. Students then have an opportunity to reflect on the multiple identities that people have and the ways in which they may assume to know something about someone who they have never met before.

On the second day when learning about diversity, Mosaic uses a simulation of inclusion and exclusion that they call the dots activity. In this activity, students have an experience of what it means to be included or excluded based on a superficial characteristic (in this case a colored dot that is placed on their forehead). In the activity students sit in a circle with their eyes closed in silence. Staff members place a colored dot on each person’s forehead. The dots are distributed so that a majority are one color, a minority another, several half-dots that are two colors with at least half of their dot the same color as either the majority or minority group and finally a single dot that is a color no one else shares. Students are instructed to open their eyes and in silence find their groups.

In this activity, students begin to immediately segregate based on the colors of their

stickers. Students point and even push others into the groups in which they belong, sometimes struggling to place the half-dots but generally pushing them away from their groups because they do not ‘fully’ belong. This activity instigates a conversation about social identities and the ways and reasons children exclude each other. It offers an opportunity for students to think about the effects of these reoccurring social patterns on their lives. They are invited to reflect on what their ideal classroom, schoolyard or world would look like, and how belonging and individuality might be negotiated in those spaces. They also explore their own agency in moving toward or creating their own vision of a socially just and inclusive school environment.

On the third day of camp, students examine the theme of interconnectedness. They participate in a hunger dinner. In a hunger dinner, students are given a ticket that randomly assigns them to a high-, middle-, or low-income status and they receive a corresponding seating and meal based on that placement. Typically, the 15% in the high-income bracket are given a three-course meal. The middle 35% will eat a simple meal of rice and beans. The 50% in the low-income bracket help themselves to small portions of rice and water. While Mosaic does a modified version of this activity distributed resources but not doing a full dinner, the activity seeks to introduce students to interconnectivity insofar as they can explore where they fit in the world in terms of resources and some of the effects of that positionality on their lives and the lives of others. The staff also led another major activity on the theme of interconnectivity that is very different from the hunger banquet, which they simply call a nature walk, which will be discussed later in this chapter.

On day four, the theme of conflict resolution becomes the focus at the outdoor camp. The early part of the day is spent teaching students about Mosaic’s five rules of conflict resolution. These include: 1) stop, cool off and take a deep breath; 2) actively listen so you can reflect back

what you have heard; 3) talk using I-statements; 4) empathize, put yourself in someone else's shoes; and 5) Seek a win-win approach to problem solving or in Mosaic terms move away from the red plan or blue plan approach and seek a purple plan that has elements of both in it.

In the afternoon, students are given a major group challenge and inevitably have opportunities to use the tools they have learned in the morning to be successful in achieving the goal of the activity which is to cross a 'river.' In this activity, staff simulate the river by demarcating a space where the water is rushing and the river must be crossed by each participant by moving across 'rocks' which can be pieces of paper or carpet. The river is rife with danger and is called the Peanut Butter Bugger Fire Snot River and the only way to cross is to brainstorm creatively with your teammates and seek their support in forming a chain of people to get across. The river monsters (staff) while often foe of the river crossers also can be helpful as a river monster might say, "you definitely shouldn't stop and cool off" or "don't stop and listen to each other, keep arguing." After the activity, students have an opportunity to reflect on how they responded to this high-pressure conflict situation and to see which tools they used, if they were helpful, how they might do things differently in the future and how they want to use the tools in their lives.

The final day of Mosaic's Outdoor camp is centered on importance of reflection. At the end of each day before bed, students write down what they valued each day and what they learned and the value cards are collected by staff. The staff members assemble these cards into books, which on day five are given back to the children and become a point of discussion.

Engaging with Complexity-Mosaic on the Edge of Chaos

Mosaic's approach is underpinned by an ontological position, which according to Ms. Mendel presupposes that "there are many sides to the story, many points of view, (and that) ours

is not the only one.” In seeking to engage with this complexity of viewpoints, identities and the diverse contexts in which learners are embedded, facilitators at the outdoor camp use a wide array of pedagogical approaches focused on multiplying feedback and supporting student participation. While epistemological leadership is to some extent decentralized with all participants having opportunities to influence conversations at the camp, those discussions are also steered toward the guiding themes highlighted above. This makes for a precarious balancing act as staff members; negotiate, adapt, and abandon learning goals and outcomes in light of a complex and dynamic array of interactions between students, staff, curriculum, pedagogy, and context. This section explores how this approach to education has brought Mosaic to the edge of chaos. The edge chaos is tenuous generative space where Mosaic’s facilitators guide pedagogical processes, help frame key questions and illuminate the thematic terrain while also adapting to the novel contributions of students and other staff and the shifting field of possibilities within this unique educational environment.

Central to Mosaic’s approach is an attempt to create spaces that can hold difference of opinion, emotional responses to the demand of complexity and multiple ways of seeing the complexity of the world. Lara encourages staff to make room for the complexity and messiness of identity and worldview in part by taking “the lead from the kids.” Lara contends that years working at the Outdoor School have taught her that a critical element of keeping curriculum relevant and alive is to have staff members who are supported in navigating ambiguity and resisting the temptation to shut down complexity by imposing an overly rigid order on emergent processes narrows the pathways for participation. She explains that navigating such complexity is a creatively challenging task for educators, an ongoing epistemological struggle that is not always easy to contend with in practice. In her own words, we “(sometimes) wish the world was

black and white, cut and dry but it's not, it's grey, blurry, and mushy.” Lara and other senior members of staff acted as coaches and guides, encouraging facilitators to remain open to co-constructing knowledge while also honestly addressing the presence of what peace studies researcher John Russell has referred to as ‘complexity fatigue’ (2007).

While Mosaic facilitators are asked continually to be open to supporting ‘what is alive in a group’ they also have some durable and stable processes they can rely on as clear curricular goals and pedagogical structures in place for each day. The activities and key curricular themes featured in the previous section are staples at Mosaic and are included in most sessions. For example, in their conflict resolution sessions Mosaic consistently uses role-playing as a pathway for children to engage with the main message of the module “if you just stand around (when violence is taking place) then you are part of the violence.” In trying to challenge the degree of powerlessness many people feel in relation to conflict, they engage in what Lara calls “assertiveness training,” which supports students in finding and practicing these alternatives to either being an observer or active participant in the violence. Students are taught nonviolent communication skills and are given multiple opportunities to apply those skills in conflict situations.

In the example of the conflict resolution module, Mosaic staff engage with complexity by utilizing pedagogical strategies (role-play and dialogue) that allow students to explore a range of possible scenarios and the students’ actions and ways they negotiate meaning in relation to concrete moments of conflict are unpredictable. They are encouraged to reflect on the changing context in which they found themselves, to identify the conflict dynamics and its effects on their choices. Yet, while student perceptions of conflict vary as do facilitators’ responses to their interventions in the moment, their pedagogical approach and the main curricular goals of the

sessions remain relatively stable over time.

Mosaic's approach resembles educational researchers Nadia Stoyanova Kennedy and David Kennedy's description of a complexity-inspired community of inquiry,

which is convened and overseen by a 'facilitator' who is committed to certain normative ideals, chief among which is the construction of an "ideal speech situation" (Habermas, 1990)—that is, a discursive setting in which everyone has equal right and opportunity to speak, in which intimidation of any sort is absent, and in which epistemological authority is distributed rather than centralized in one person." (p. 2)

Yet Mosaic facilitators do not seek to enable purely open ended processes but rather try to make sure that within such unpredictable processes students leave the conflict resolution session having been exposed to "the main point" in this case that they do not have to choose between being either "passive or aggressive" in responding to conflict.⁸¹ This framing that one does not have to be either passive or aggressive in relation to conflict opens up a more complex discursive space as the challenging of this dichotomized thinking encourages students to engage creatively with its implications, namely that there is a whole range of alternative ways of perceiving and acting in relation to conflict. In this way, facilitators allow for greater creative possibility within these thematic boundaries. Mosaic is perched on the edge of chaos as those alternative possibilities in terms of responsiveness to conflict are expansive and facilitators are unable to predict how students and staff will respond in a session. Yet simultaneously the range of discursive possibilities is still influenced by the facilitator and the pedagogical form they seek to maintain.

All of Mosaic's sessions at the outdoor camp include this creative balancing act between clear curricular goals, pedagogical forms and emergent opportunities. In this way, The Mosaic

⁸¹ This framing that one does not have to be either passive or aggressive in relation to conflict also opens up a more complex discursive space as given the challenging of this dichotomy students are encouraged to engage creatively with its implications, namely that there is a whole range of alternatives ways of perceiving and acting in relation to conflict.

Project is perched on the edge of chaos as educators teach a core curriculum with set activities that they believe generally work and are somewhat durable over time yet they are also encouraged to respond and adapt to what is emerging in the moment. This was done with a recognition (at least on the part of Lara and other members of the leadership team) that even core educational processes at the camp do shift significantly because of small changes over time. Complexity thinkers, Carolyn Mamchur and Linda highlight the importance of the edge of chaos in education emphasizing it as a space “where new ideas and innovative genotypes are forever nibbling away at the edges of the status quo, and where even the most entrenched old guard will eventually be overthrown” (Waldrop, 1992, p. 12).

Curriculum and Training Director Cherine Badawi offers a concrete example of how such emergent praxis and pedagogical and curricular change becomes precedent over time at Mosaic’s camp. She explains that on day three of the camp they typically do a nature walk, the goal of which is to reflect on the day’s theme of interconnectivity. Students are led through the forest and encouraged to observe multiple types of inter-relationship within and between various ecosystems as they are taken down a path, which ends with huge ancient tree. The students are left to walk the final stretch to the tree alone, traveling 100 meters by themselves. When they arrive at the tree they are given time to reflect on the theme of interconnectedness and to “listen to what the tree has to say.” For some students this is the first time that they have an experience of being alone in the forest (although staff members are nearby) and with an enduring period of silence.

This nature walk is a standard practice for day three of the camp and staff members are trained to lead this process. Cherine explained that she and a fellow staff member once had an idea for altering the activity. They wanted not only to explore interconnectedness to the natural

environment but also across generations. They designed a libations ceremony for “students to think about their ancestors” and they adapted the ceremony from a West African tradition, where participants are invited to speak out the names of their ancestors and to pour water as a sign of their gratitude as each name is said. In pouring the water students are encouraged to think about how it can help the plants grow much as their ancestors and members of their society before them have helped them become who they are today. This ceremony received positive feedback from the students the first few times they tried it and Cherine then led other staff who were interested in learning more about it, in the activity. Cherine received feedback from her colleagues about how to strengthen and improve the activity and the libations ceremony was then taken up and modified by numerous staff who also integrated it into their approach (although not all staff members use it). It has since become one of the suggested adaptations for camp facilitators and it adds to the field of possibilities by providing an alternative pedagogical tool and way of thinking through and exploring the theme. It also adds to a host of such possible adaptations, which encourage novelty and enrich the field of possibilities.

This approach to embracing epistemological diversity fits with Lara’s ontological view of the world and she maintains that the complexity of human identity and interaction is such that novel forms of knowledge are bound to emerge and thus it is counterproductive to resist such change. However, it is important to note that what emerges at the camp is not without limits, they are not simply continually trying to maximize change. The limits at the camp often are subtly intuited by Mosaic staff and are heavily influenced by the thematic boundaries and historical legacy of the project as well as the existential realities of the spaces in which they are working. The culture of Mosaic frames and shapes the way these conversations around what is possible are held. So while these conversations have room for the unexpected and for emergent responses,

those responses occur in large part in relation to narrowly defined thematic content and premeditated educational processes supported by Mosaic.

Mosaic offers an example of emergent pedagogy within boundaries—boundaries that are set by a complex interaction of various structures of expectations, material resources, temporal boundaries and the unique people and relationships at the camp. The Mosaic Project's context and the boundaries of educational possibilities are influenced in part by not only the temporal location and interactions of staff and students but by the structure of expectations that have developed over the past decade of Mosaic's work. This organizational memory is reinforced by the leadership through staff training and in terms of the field of possibilities communicated in the discursive domain that has developed at the camp. In other words, embedded in how people at Mosaic speak about praxis is both a clear expectation of what is 'supposed' to be happening at the Outdoor School and simultaneously an understanding that it may not necessarily happen that way and that such breaks from the norm have been/will continue to be rich sources of learning and development.

Mosaics lesson plans and overall approach are integrated within an explicit and pervasive commitment to a culture of listening, open dialogue, and feedback for both staff and students at the outdoor camp. They emphasize identity work as complex and their approach reflects an ontological commitment to engaging with complexity. They do so inasmuch as they stress that the goal is not to oversimplify but to provide a wide range of learning opportunities, diverse role models for engaging with the multiple identities of students and an eclectic and growing body of pedagogical processes. However, while their praxis is aligned with an ontological commitment to complexity most educators at Mosaic are not explicitly influenced by the literature in the field of

complexity theory.⁸² Rather, their orientation to education on the edge of chaos is supported by a deep commitment to responding to social and ecological diversity and drawing on art in education as a methodology for expressing and reflecting on such diversity.

Mosaic differs from more mainstream approaches to education in that their alternative ontological orientation supports rather than resists education on the edge of chaos and they have developed a wide array of social technologies that aid in generating multiple opportunities for feedback and adaptation. This is not to say that their engagement with complexity is unproblematic as they face the continual challenge of opening up to possibility while attempting to improve and maintain what they see is working in their approach. This is the work of education on the edge of chaos, which suggests a constant tension between the language of possibility and continual adaptation and the desire for stability and finalizing narratives in education.

Mosaic's In-School-Program: In Search of more Far-Reaching Change in Education

The Mosaic Project is currently seeking to strengthen their programs by generating a more robust in-school project that can provide preparation for and the ability to build on their outdoor camp. Over the past decade, Mosaic has experienced increasing numbers of student participation and they have received interest from over 20 schools in these additional in-school programs. These programs are based on interest that has been generated from the success of their outdoor camp and they intend to build on those strengths in designing their in-school projects.

While Mosaic has not undergone any long-term longitudinal studies to examine the core contributions of the camp, they do administer evaluations and collect data based on pre and post camp surveys. Nanette Cowardin-Lee, a doctoral candidate at Alliant International University in

⁸² However, Lara Mendel and Cherine Badawi have both read about systems and complexity theory.

San Francisco, worked with The Mosaic Project in 2007-2008 to re-design their evaluations for assessing student perceptions both before and after Mosaic's Outdoor School. Doctor Lee sought to make those evaluations more rigorous and "performed an initial analysis of the 2007 pre and post program surveys and compared them to data from the 2007 California Healthy Kids Survey (CHKS)."⁸³ Mosaic's research initiative found "statistically significant"⁸⁴ increases in a range of areas as conveyed in the data below for the following themes including; community, self-esteem, appreciation of difference and identification of discrimination, empathy and conflict resolution skills.⁸⁵

Mosaic staff contend that these findings imply that their program "increases the abilities in our students in the areas of empathy, conflict resolution, anger management, and identification of discrimination, as well as increases students' self-esteem, contentment with school, appreciation of difference, and visioning of the future."⁸⁶ However, there are obvious limitations to this data set as it offers little insight into the length of time that such attitudinal changes persist.⁸⁷ Mosaic is at a point where its alumni students from the 4th and 5th grade are now in high school. Many are returning as Youth Leaders, which offers some degree of feedback that the program had sustaining effects. In 2011, Mosaic will also instigate a questionnaire to be distributed to Mosaic alumni who are at least five years out of the experience. That too should

⁸³ Fall Evaluation Summary of the Mosaic Project

http://www.mosaicproject.org/PDFs/2007_Fall_Eval_Summary.pdf

⁸⁴ Student's t-test, $p \leq 0.05$ The numbers following the questions are pre and post program survey mean response, respectively. The questions where students rated their feelings are on a scale of 1 to 4. The questions asking for a list are the mean number of valid answers. Those asking for a definition are the number that had a valid definition. These results are based on paired surveys taken by 326 children from various schools representing different socio-economic strata. This sample has enough power to be able to extrapolate findings to a demographically similar population of approximately 300,000 children with a confidence level of 95% and a confidence interval of 4-5%. Excepted from: http://www.mosaicproject.org/PDFs/2007_Fall_Eval_Summary.pdf

⁸⁵ Ibid

⁸⁶ http://www.mosaicproject.org/PDFs/2007_Fall_Eval_Summary.pdf

⁸⁷ Further, while the researcher claims a 95% confidence level for abstracting the results to larger demographic groups the research draws from a small sample of 326 children.

generate valuable data about the longevity of the program's effects and a deeper insight into why some students remain engaged with the organization and why others do not engage.

Mosaic's primary focus has been on generating transformative experiences around the themes of social and ecological diversity and the data above suggest that they have been able to shift student's perceptions of themselves and the world when students attend the outdoor camp. However, that program takes place in a space far away from the walls of traditional schools and Mosaic has increasingly become interested in deepening the effects of their influence on student learning both before and after they attend camp. Recently (much like the Center for Ecoliteracy) they have become more involved in projects that they hope can lead to larger school-wide transformation. One of Mosaic's main challenges has been to find ways to become an integral part of students' lives and to translate their adaptive praxis to formal educational environments. In the past two years, they launched a more comprehensive In School Project with 8 of their 28 partner schools. Amid the early chapters of this new journey, they are faced with sizable challenges in developing an approach that effectively can nurture the kind of deep changes that students report following their camp experience.⁸⁸

While Mosaic has an interest in bringing their experiential pedagogy and interdisciplinary curriculum into formal educational spaces, their staff report that this is a very difficult challenge. Cherine Badawi who is the Curriculum and Training Director explains that it simply "is not possible to do what we do at Napa (the camp) in schools, yet there are some important elements of the Mosaic experience that we can bring in (to schools)." Cherine contends that there are critical differences that change the experience of working in schools. Notably the schools she works with often do not have students from varied racial and socioeconomic backgrounds that

⁸⁸ Mosaic receives a significant portion of its funding from personal donations from families and friends of students who have been moved by their projects.

Mosaic intentionally bring together at the Outdoor School. Consequently, according to Cherine, the dynamism that often is catalyzed by the intrigue, fear, curiosity, etcetera, of students who are coming together across lines of difference is not present in the same way. Further social diversity, an important theme in Mosaic's curriculum, can become more of an abstract idea than a lived reality in some of these more homogenous spaces.

Mosaic has made a few attempts to bring alumni children from different schools together through their in-school initiative to recreate some of the 'Mosaic experience' but they have struggled to create what Cherine called "the neutrality of the third space" (referring to the space provided at the Outdoor School). This thus created challenges that were difficult to remedy according to Badawi as, "young people were then traveling to someone else's school and the power differential was never right." As a result, Mosaic has changed the approach they use at the outdoor camp of bringing various schools together across socio-economic lines instead working with one school at a time. They continue to offer examples of arts-based and experiential pedagogy and they have adapted their curriculum to be developmentally appropriate for students K-8 and for the formal classroom environment.

In seeking to demonstrate the effectiveness of these methodologies and influence classroom teachers Mosaic brings their facilitators to the schools to train teachers, model lesson plans and try to emulate the 'creative spirit' of Mosaic. Cherine cites widespread 'buy in' from staff and students she noted that it is too early to assess fully the degree to which partner schoolteachers, administrators and students are being influenced by this approach and the degree to which these schools will self-organize in terms of generating experiential approaches and engaging in curricular development.

While Mosaic has drawn on alternative pedagogies, they have not as of yet drawn on the

possible alternative educational spaces surrounding the schools. Those spaces could include outdoor ‘classrooms’ similar to RSL’s approach. For example, CEL regularly used the garden, the kitchen, and the lunchroom to expand the complexity of spaces for learning. Mosaic could also work with partner schools in identifying alternative educational spaces off campus (e.g., nearby parks, community centers, school gardens, artist’s lofts, dance studios). When asked, Cherine identified off-site classrooms as ‘a potential frontier’ in the future. While this could become a part of the Mosaic model as these spaces create an expanded range of pedagogical possibilities in these early phases of implementation Mosaic staff have mostly been focusing on bringing experiential and adaptive curricula into the classroom, which alone requires a sizable amount of time and resources.

Mosaic’s in-school programs will likely continue to be an area of increased focus in the upcoming years as their goals of whole school change are ambitious and difficult to attain. As Cherine noted, critical elements of the Mosaic experience are missing from their in-school work including working with students from a wide range of socio-economic diversity and regularly being in nature. This diversity of pedagogical spaces is a vital source of energy at the Outdoor School that has been missed in the in-school project. Further, the culture of standardized testing, hierarchical decision-making and teacher-centered authority that still dominate most schools requires large-scale changes in educational philosophy and approach for Mosaic’s pedagogical approach to gain purchase.

At the outdoor camp, Mosaic staff members have less constraints in developing approaches that are resonant with insights from complexity theory. They integrate alternative educational spaces to allow engagement with a more complex array of learning experiences, arts-based and dialogical processes to solicit multiple forms of feedback and catalyze multiple

intelligences, and a diverse staff to model different approaches to education and life. As has been highlighted in other parts of this dissertation, a complexity theory viewpoint challenges the idea of the reducibility of many complex social phenomena.

In other words, the holistic experience of a living pedagogy and curriculum that has been cultivated at Mosaic's Outdoor School is more than the sum of its parts and cannot simply be transplanted into schools or reassembled piece by piece. This makes for interesting choices when designing an implementation strategy as it is difficult to try to pull apart different aspects of that work and then to implement it in a very different environment. Cherine's orientation seems to suggest that she recognizes this as she contends that the in-school program is "something very different (from the camp)." Complexity would hold that the chances that there will be similar outcomes are low if Mosaic were to try simply to transfer their activities to a new environment. Instead, in the early phases Mosaic has chosen to concentrate their energies mostly on professional development for teachers, modeling lesson plans and attempting to collaboratively generating in-school curriculum.

Initially they are attempting to transform some of the challenges that the RSL staff raised in response to the ESY program—being seen as outside facilitators that 'come in and do' curriculum with limited sustained pathways for influence. Mosaic staff contend that for the curriculum to be most effectively implemented it would need to build on the success of its camp curriculum by breaking down disciplinary boundaries but that in school teachers will need to play a role in the development of these materials. These interdisciplinary approaches are created more easily in alternative spaces like the outdoor camp than in schools, as the disciplinary structure of schools is deeply entrenched and structurally reinforced. For Mosaic to shift the curriculum and pedagogy of schools, it may need to shift the organizing structures and the ways

teachers, administrators and even parents and members of the community work together.⁸⁹

Increasingly, Cherine has identified the need to work with multiple stakeholders to have a chance of affecting whole schools change. However, given this realization that is necessary to sustain multiple points of influence within these complex learning systems to initiate systemic change, doing so has proven difficult. One reason for this difficulty is that the task of implementation falls mostly within the domain of a single staff member within an organization that has limited funding. Further, Cherine's emerging sense that whole schools change and generating a 'culture shift' in schools requires multiple small inputs, raises interesting questions from a complexity theory lens: How can one best instigate such distributive influence? What is the minimum amount of input that can create the maximum amount of creativity? How can one measure the effects of such small changes within larger systems, especially if such changes occur through complex nonlinear dynamics? How can one elucidate the complexity of the adaptation that is taking place because of these efforts at change? How can one track novel interactions that may be emerging because of these new inputs?

While Mosaic's educational methodology and approach to implementation is often complex, they are limited in terms of the financial and staff resources they can offer toward sustaining these processes in schools. Further, their evaluative instruments have thus far been mostly confined to standard individual assessments and seem to reflect a more mechanistic/reductionist approach to research. They mostly seek firsthand accounts from individual students, parents, teachers and administrators and have not explored more collective and participatory processes for generating feedback in their formal data collection activities.

⁸⁹ Toward this end, they have recently developed a 90-minute training for parents which introduces them to their educational philosophy and gives them an experience of their pedagogical approach and a host of other outreach efforts.

Where approaches that are more mechanistic see learning as an individual activity, complexity theory points toward learning as an emergent property of systems (Doll 2005; David & Nadia Kennedy, 2010; Tom Kieren & Elaine Simmt 2009). Therefore, Mosaic's reliance on individual assessment may result in missing opportunities for critical feedback and observation in terms of the novel ways that people are interacting and working together within the school where they are piloting their projects.

While there are benefits to experimenting with complexity-inspired research methodologies such endeavors are challenging. The previous chapter examined complexity-inspired methodology and revealed that the best approaches to 'capture' this kind of data about the complex dynamics of educational change is a highly contested and under-developed area in the complexity and education literature. On the other hand, there is no shortage of participatory methodologies for bringing together various stakeholder to solicit feedback and for observation of shifts in collective behavior (Denzin & Lincoln, 2005) should Mosaic seek to apply a complexity-inspired approach in this domain.

While Mosaic's evaluative orientation is not fully in keeping with the insights of complexity theory at this time, their pedagogical vision and ideas for how larger educational changes take place does at times reflect an ontological understanding of complexity. In terms of the best approaches to initiate school-wide transformation, Mosaic employs a strategy focused on deeply influencing a few teachers and the quality of the relationships in those classes in each school. They then hope that those learning collectives will exemplify mosaic's approach to education on the edge by embodying Mosaic values and utilizing adaptive approaches to engaging with complexity that will then ripple out throughout the school in unpredictable and creative ways. Peacebuilding scholar John Paul Lederach used the term 'critical yeast' to

highlight the potential of this approach where a few distributed agents of change working within complex systems can influence larger transformation (Lederach, 2005).

Lederach contrasts critical yeast with the more popular concept of critical mass, which refers to the presence of an overwhelming large group of people committed to change who then exert the kind of influence needed to shift a system. Critical yeast on the other hand, refers instead to getting a smaller but diverse enough group of people so that when they all begin to engage their networks, their influence is distributed rather than hyper-localized and this creates conditions ripe for novel collaboration in ways that can influence far-reaching systemic change. Lederach explains, the challenge is in “creating the quality of the platform that makes exponential growth strong and possible and then...finding ways to sustain that platform” (Lederach, 2005, p. 93).

In terms of influencing larger educational change, both Mosaic and CEL are seeking this kind of small distributive change described by Lederach’s critical yeast metaphor for social change. They are working to shift the quality and types of relationships in schools through employing a wide range of participatory pedagogical strategies and curricular materials that seek to illuminate complex adaptive systems. While these small projects seem to be up against insurmountable odds especially when considering that schools make great efforts to be stable and efficient and resistant to unpredictable change, these educators suggests that those same schools may be closer to the edge of chaos than is apparent when viewed through a mechanistic lens. If small inputs can produce unpredictable outcomes within nonlinear systems, as complexity theory suggests then Mosaic and CEL have a chance to produce large-scale changes. This raises a key question for both Mosaic and CEL: How can they understand the dynamics that are contributing to these larger changes if they are occurring?

Mosaic is currently attempting to assess where in-school staff are internalizing these ontological commitments and acting on them (becoming critical yeast) and the ways in which those changes are rippling out. While both Mosaic and CEL are limited in terms of their methodologies for evaluating complex change and the pathways through which they can influence change in formal educational environments, they do offer a rich body of work when considering concrete pathways for engaging with complexity in education and catalyzing such change. In considering their challenges, complexity theory reminds us that educators cannot control the messy condition of education but rather at best offer descriptive accounts of the dynamics of adaptive praxis and the generative moments and conditions that lead to learning on the edge.

Toward Conclusions

This chapter used complexity theory as a hermeneutic device to illuminate peace education praxis in the US and Japan in response to global complexity. It examined the efforts of a number of individuals and projects mostly located in Hiroshima, Japan and the San Francisco Bay area of the US. These diverse learning locales and the adaptive orientation that these educators adopted provided ample opportunities to examine the innovative social technologies and knowledge generating practices these educators utilized when opening up to complexity. It also offered insight into the epistemological and ontological orientations that underpinned these approaches.

The educators featured in this chapter distanced themselves from the language of control, repetition and evaluation popular in education today choosing instead practices that were often congruent with the ontological insights of complexity theory. Several important trends emerged as these educators engaged with global complexity. These practices, while varied, often

involved; 1) diversifying curricular approaches by experimenting with interdisciplinary and transdisciplinary approaches; 2) diversifying pedagogical practices thereby minimizing reliance solely on teacher centered approaches; 3) multiplying pedagogical spaces including using spaces outside of the school walls and connecting with people through means of instant communication; and 4) developing theories of change in terms of engagement with the dynamics of school-wide transformation that suggested an understanding of complexity.

This chapter advanced the argument that these changes in praxis often reflected not only a shift in educational strategies but also an alternative orientation toward the field of possibilities in education—a shift in worldview. In terms of engaging with complexity by diversifying peace education content, both Mosaic and The Center for Ecoliteracy focused on developing curricula that not only presented atomized accounts of phenomena. Instead, they offered many opportunities to analyze relationships within and between systems. For example, both CEL and Mosaic drew on the interplay between ecosystems, social/cultural systems and personal identity in their curricular materials. These approaches illuminated concrete pathways for engaging in interdisciplinary and even transdisciplinary approaches as they examined relationships in systemic contexts that cut across disciplinary boundaries. The implementation of these curricular materials and approaches was demanding, as it required a great deal of support and commitment from schools. CEL and Mosaic each worked with teachers from various disciplines to develop ways of illuminating cross-curricular themes and connecting cross-curricular threads.

These attempts at interdisciplinary exploration of complexity were not without their challenges. Mister Matsui emphasized that as peace education curriculum in Hiroshima grew more complicated with time it did not necessarily give way to insights into the profound inter-rationality of the phenomenon being studied. Matsui's inquiry highlighted the challenge of

illuminating patterns within and between various systems in the curriculum while not simply teaching about an ever-expanding array of largely disconnected topics and subject matter.

Importantly, CEL, Mosaic and Mister Matsui all relied heavily on participatory approaches to pedagogy to make their complexity-inspired curricula relevant and comprehensible.

Thus in all three projects examined in this chapter, the task of engaging with complexity demanded an expanded range of pedagogical processes. In Japan, Mister Matsui increasingly reduced lecture time and moved out of the classroom. He supported opportunities for his students to engage in field research and community outreach within the city and both he and Mister Suigera cited the important role that such experiential opportunities afforded students and staff. The RSL program on the other hand integrated the lunchroom, garden, and surrounding ‘natural’ places as primary educative spaces. Mosaic created an enchanting and creative learning environment in ‘the woods’ that wove together music, role-plays, theater, and a host of experiential arts-based approaches outside of traditional school settings.

These approaches reflected pedagogy that was in keeping with the insights of complexity theory. First, they often supported an expanded array of feedback processes, which provided additional occasions to be responsive to emerging opportunities in the learning environment while engaging larger numbers of people in responding to those opportunities. Further, because of more widespread participation student and teacher feedback reflected a deeper sense of transformative engagement with the subject matter and expanded sense of agency in terms of responding to global complexity. The expanded social technologies employed by these educators also allowed for processing that was more collective, kinesthetic movement and varied influences in the educational experiences thereby creating opportunities to engage a fuller range of intelligences.

It is important to note that with the exception of CEL these and other radical responses were often not conceived of in terms of a formal commitment to complexity theory but rather emerged as an intuitive need to create pedagogy and content that was more in keeping with the realities of learning within and about a complex world. Thus, they privileged approaches that provided opportunities for encounters that highlighted fluidity, diversity, and dynamic change over time. These ontological commitments to engaging complexity deeply affected each educator's sense of pedagogical time, place and possibility blurring the typical lines of when and where learning began and ended. Their efforts pointed toward an educative orientation that sought to embrace semi-durable pedagogical process and curriculum while also tending to emergent opportunities and unexpected change. In this way, they demonstrated applied approaches for educating on the edge of chaos.

In many cases, educators did not limit this sense of potential to their immediate learning locales but rather saw multiple actual and virtual spaces for pedagogical moments. Mister Matsui and the CEL prioritized the importance of global connectivity for maximizing learning. Mister Suigera pointed toward the importance of recognizing the influence of open systems and that fact that pedagogical change across Japan could be traced to the influence of other educators throughout the region including China, Korea, Singapore, and India. This sense of porosity and of connectivity to larger ecologies of learning illustrated a sense of embeddedness that educators and students often felt within larger systems. Matsui, Suigera and the other educators interviewed in Hiroshima consistently pointed toward the important role that global connectivity via information technology played in terms of expanding knowledge generating opportunities and creating feelings of connectedness. Their location within advanced globalized and informationalized societies meant that easy access to high-speed communication and travel was

assumed and consistently influenced their ideas of what was possible. In fact, such global connectivity consistently was framed in terms of an opportunity and a boon.

This sense of dynamic interaction within multiple nested systems was at the heart of these practitioners' sense of how educational change could take place. Both CEL and Mosaic employed a view of change that was similar to Lederach's idea of critical yeast, in that they maintained that a small number of agents effectively distributed throughout a system while small in numbers could affect large-scale change. The CEL developed a complexity-inspired approach to whole schools and district-wide change that highlighted the importance of strong school teams and a multi-school approach to district change. They overtly acknowledged that such change likely would be full of surprises. This way of approaching change was underpinned by a complexity-inspired ontological view that privileged, and thereby hoped to engage with nonlinear processes and interconnected systems in ways that privileged opportunities for change. However, while CEL focused on change across various levels of organization in each of the participating schools and within the larger district they did not develop a robust working definition for whole schools change and they did not have well-developed tools for analyzing such changes with such complex and interrelated systems.

Mosaic much like CEL also sought to effect larger education transformation as they increased their in-school programs to include participation in 28 different schools. They focused initially on training teachers in the arts-based and experiential pedagogical approaches of Mosaic as well as offering interdisciplinary curricular materials to teachers. Teachers and students both indicated through formal feedback processes a growing interest in Mosaic's in-school programs and a positive influence on their approaches to teaching and learning. However, Mosaic faced a host of critical challenges in their implementation efforts within traditional educative spaces,

which made it more difficult to engage students from socio-economically diverse backgrounds and to draw on the diversity of educational spaces and processes used at the outdoor camp. Further, staff at Mosaic increasingly noted the ongoing need to enroll more participation from a wider range of stakeholders in the project. While Mosaic was in the early phases of implementing their more robust approach to whole schools change they, like CEL, struggled to develop evaluative measures that could reflect the change influenced by their complex approach to educational change.

The projects featured in this chapter are significant as they demonstrate both effective responses to global complexity across highly diverse social locations (literally on different sides of the planet) and some of the challenges and limitation of engaging in such ambitious endeavors. Their curricular and pedagogical choices, sense of possibility and ontological orientations offers an incomplete but significant sample of potential responses to global complexity. Further, they point toward a radically different sense of possibility in terms of ontological orientation and pedagogical practices when compared to mainstream contemporary approaches to education. In all, these educators sought to engage with a host of dynamic opportunities that were occurring across and within multiple systems of influence and connection. This attitude of engagement with the complexity of context thus offered an important set of examples and practical pathways for education that seeks to engage with rather than reduce complexity and respond to the demands of teaching for peace.

While the variability of context featured in this chapter is important to note in these cases, it must also be qualified as the pedagogical and curricular adaptations profiled here all occur within 'advanced' informationalized and globalized societies. Consequently, the privileged position of these educators within the global economic and political order is significant as it

shaped these educators ideas of the global and their priorities around sites for contestation and the trajectory of the projects they chose to initiate. Notably, these educators conceptualized the global primarily as a space of possibility and growth not as a place of contestation and resistance. The complexity of the global was minimized by their positionality even while they worked tirelessly to open up to complexity. Additionally, my role as a researcher (from the global north, white, male privileged) reconstructing the significance of their work is problematic as I too am embedded within these global flows of power. Thus, we should expect that some of the more critical elements of these educators work were likely marginalized or missed because of my interpretation of their work.

Given that one's positionality influences how they see the global thus reducing complexity it is helpful then to survey a wider range of educators (not only those in the global north) to get a fuller sense of the field of possibilities for education on the edge. The next chapter seeks to do so by examining the ways that educators in India are conceptualizing and responding to the opportunities of global complexity. The differences in their vision and the approaches that emerge from their unique positionality in the global south allow for a broader analysis of the role of economic and political power in engaging with complexity. It also introduces a larger frame for considering how varied conditions influence educators' choices for initiating projects, and the creative sites they choose for resistance and transformation.

Chapter 7: India and the Struggle for Epistemic Complexity

Introduction

The previous chapter was an examination of the creative efforts and struggles of peace educators in Japan and the US providing a window into their strategies for engaging with global complexity and the ontological orientations through which they made sense of such efforts. These educators embraced a wide array of pedagogical strategies for generating increased feedback and dialogue within learning communities and they expanded and continually diversified their curriculum over time. Further, in seeking to support learners in negotiating harmonious relationships within multiple, dynamic and interconnected systems, they expanded the spaces used for education. In short, their engagement with complexity required that they re-imagine education moving beyond reliance solely on reductionist thinking and mass education practices and toward emergent approaches to praxis that challenge mainstream conceptions of control, replicability, and evaluation.

The approaches of the peace educators featured in the previous chapter were significant in light of three central claims made in this work: 1) that education need be responsive to global complexity to be relevant to the times in which we are living; 2) that complexity theory provides a promising descriptive explanatory lens for evaluating educational engagement with complexity; and 3) that peace education offers a robust albeit incomplete body of work when considering approaches that engage with global complexity. That engagement is grounded in an alternative values base and epistemic orientation that emerges from a global network of practitioners who often display an openness toward adaptive praxis and responsiveness to the complexity of working within and across a wide range of contexts.

This chapter seeks then to broaden the scope of this work by focusing on the embedded

values, epistemic vision and knowledge generating processes developed by peace educators working in India. These educators are faced with significantly different opportunities and challenges in relation to global complexity than their counterparts in Japan and the US and as a result, they offer variant examples of praxis for engaging with such complexity. This chapter therefore examines their work within a rapidly industrializing/globalizing country and the complex ways that their positionality influences their praxis over time. It is that positionality, within a crucible of globalizing education (at the intersection of international political and entrepreneurial forces) that the educators featured in this chapter all openly sought to resist what they saw as the delegitimizing influence of the western language of efficiency on ‘indigenous’ and ‘local’ forms of knowing. Thus, this chapter features Indian educators’ approaches for confronting the pressures of ‘development’ through the lens of thousands of years of ‘civilization,’ and it analyzes the emergent opportunities within these complex conditions.

Given the shortcomings of an overreliance on mechanistic educational responses to complexity that have been challenged throughout this dissertation, and the challenges educators face when creating adaptive responses to that over-reliance, India offers a fascinating case for considering a move toward the edge of chaos. Retired professor of education Anil SadGopal explains a sentiment echoed by many of the educators I interviewed in India when he expresses his concerns about the direction in which Indian education is currently moving:

Globalization needs only a limited number of ‘thinking’ people—those who would generate new knowledge for extending its market agenda. Even these limited number of ‘thinking’ people will be ‘trained’ or ‘conditioned’ to restrict the domain of their thinking in the interest of the market. From this standpoint, the rest of the people—especially the masses—need not become thinking people, certainly not those who apply thinking to their objective reality. (SadGopal, 2005, p. 95)

In critically reflecting on the language of control and efficiency used within education in India in the service of market forces, SadGopal raised a simple question, with which many of the

educators featured in this chapter sought to engage; How can Indian education remain committed and responsive to local knowledge and needs in this age of globalization?

In their efforts to respond to the complex forces of social change these peace educators, much like their counterparts in Japan and the US, embraced approaches that indicated an ontological shift that was often resonant with complexity theory.⁹⁰ This chapter is an examination of the creative ways that educators in India struggled for autonomy and conceived of and implemented self-organizing processes through community-based education projects as a response to what they understood as global forces that sought to shut down complexity. In this way, educators in India responded to the local and global as inextricably linked and co-evolving forces pregnant with educational possibilities. This chapter brings to the foreground the explicitness with which these educators responded to global flows of power in what could be described as an epistemic battleground in terms of the role of ‘swaraj’ [self-determination] in education. It builds on the previous chapter by both offering a substantially different view of education on the edge of chaos and highlighting the ways in which these educators’ approaches were consistent with an orientation informed by complexity theory.

This chapter focuses on two educational projects, the LokaVidya [local knowledge] Movement (LVM), which is based out of the Vidya Ashram in Sarnath India, and the People’s Free University (PFU), which has been spearheaded in part by Banwari Lal Sharma, a retired mathematics professor who lives in Allahabad. These educators are engaged in shifting knowledge practices in ways that challenge what Arturo Escobar refers to as “the territorial and

⁹⁰ It is necessary to note here that equally it could be argued that such ontological shifts toward seeing dynamic interconnectivity are deeply rooted in Vedic philosophy. However, as pointed out in chapter two, western models developed during the mass education movement in Europe were enforced abroad through colonialism and Indian education has been deeply influenced by western models. Thus the shift noted in this case referred to in this instance, is a move away from those reductionist practices long practiced across the sub-continent.

cultural imperatives of imperial globality” (2008), which include the control of people, resources and territory and produce exploitative and unequal relationships (Escobar, p. 64). LVM and the PFU were selected because of both their overt and sustained resistance to mechanistic forms of education, which they view as supportive of imperial globality and the richness of content and pedagogy they have developed as an alternative to such approaches.

Challenging Globalization

Educators in the global south often find themselves on the front lines of an epistemic battleground in public education where hegemonic interpretations of globalization are being challenged by those who are being asked to ‘globalize’ (Carnoy & Rhoten, 2002). Arturo Escobar in his work *Territories of Difference*, highlights the dangers of these hegemonic interpretations of ‘development’ which posit “there is no outside to modernity, that from now on its modernity all the way” (Escobar, 2008, p. 162). Both the People’s Free University (PFU) and the LokaVidya Movement (LVM) offer important cases to analyze as they highlight the role that political power and ideology can play in influencing how educators conceptualize the global and assess opportunities for engagement with complexity through education.⁹¹ This ‘radical’ interpretation placed the educators I interviewed within larger transnational resistance movements to hegemonic interpretations of globalization and blurred the lines between politician, organizing and education. The Indian educators featured in this chapter offer an extensive body of work in response to opening up to complexity to examine as they sought to diversify and legitimize alternative forms of knowledge production practices in the service of creating social forms that could support a greater degree of equality and economic sustainability across Indian society.

⁹¹ Sadgopal, Banwari Lal Sharma, Sunil Sahasrabudhey all cited the legacy of formal education in forwarding British imperial imperatives during colonial rule.

Sunil Sahasrabudhey, Banwari Lal Sharma, Anil SadGopal and other educators I interviewed in India were quick to point out that understanding and engaging with the influences of neoliberal globalization and expanding critical spaces in education had increasingly become a priority over the past decade. They contend that social and environmental issues are worsening and that the field of education is being affected negatively by the intensity of corporate globalization and western nations promoting their own narrow self-interests through international political and economic organizations. Mainstream globalizing rhetoric, they argue, shuts down many people's recognition of complexity both in terms of reducing what they see as possible in terms of their role in influencing their own future, as well as minimizing the importance of the real problems they face regarding the environment, making a living wage, educational quality and a host of other issues.

Sunil Sahasrabudhey, Banwari Lal Sharma and Anil Sadgopal all highlight the primary role that Multinational Corporations (MNCS) and international institutions play in contracting the epistemic boundaries of education by offering overly narrow conceptions of development, undermining democratic processes and aggressively altering traditional identities (Global America, Ulrich Beck et al. 2003, Held & McGrew 2007, SadGopal, 2005). These educators are far from alone in their analysis as many authors have recently noted the decline in power and influence of national institutions on civic and cultural life, (Catsells, 1996; Giddens, 1985; Held & McGrew, 2007; Stiglitz, 2003) while others note that MNCS have made considerable gains during this same period (Deetz, 1992). This sense of decreasing local influence through formal political channels as the nation state increasingly responds to transnational elites combined with the changing and marginalized role of national cultures and knowledge practices provides a context in which these peace educators in India feel a sense of urgency in formulating their

responses to global complexity (Held & McGrew; Zygmunt, Bauman & Liquid Times, 2007).

This is significant within the larger field of peace education as nation states and national identity has been a central focal point over the past five decades (Aspeslagh, 1996). Additionally, peace educators often work through state educational institutions, which may partially explain why many peace educators do not engage with views that are critical of the state's role in forwarding a neoliberal agenda. Contrary to educators in Japan and the US, educators in India often articulate an adversarial stance with relation to traditional academic institutions, and they contend that there are few spaces to engage in peace education efforts (that are critical of globalization) within formal education and that universities are often resistant to such proposals.

Vandana Shiva, Sunil Sahasrabudhey, Banwari Lal Sharma, and Anil SadGopal all argue for the need to make curriculum more complex and to search for different pedagogical approaches and spaces in light of their contention that mainstream education is predisposed to enforce overly simplistic pedagogical and epistemic practices while reinforcing the political status quo (A Dialogue on Knowledge in Society, 2004; SadGopal, 2005). Sunil for example, contends that people teaching within universities in India often lacked a critical lens when conceptualizing the global. He argued that within the universities, teachers and administration often did not see neoliberal rhetoric as 'socially' constructed but rather misconstrue it as "universal philosophy that reinforced the status quo" in terms of mainstream conceptualizations of development. He and his colleagues in the LokaVidya movement see things differently as he explained in his interview when stating, "when we are talking about globalization we are not talking about anything global, anything universal" but rather something that has been generated by and for 'elites.'

According to SadGopal, Lal Sharma and Sahasrabudhey this critical analysis of the

discourse of corporate globalization is often conspicuously absent not only within mainstream education in India but also in peace education work both within India and abroad.⁹² This contention of a blind spot within the field at times is reinforced in the international peace education literature. For example, the 2008 edition of the Encyclopedia of Peace Education, which is meant to provide a brief overview of the main thematic areas of concentration in the field does not mention the term corporation or corporate once. This trend is ironic given that interest in globalization has grown across areas of study within peace education, and it is ubiquitous as people cite the ‘effects of globalization’ in nearly every peace education content area (Baja, 2010, p. 46-47).

This narrow conceptualization of the global is significant when considering more holistic approaches to peace education, which need take into account the effect of power on how the global is conceptualized and where opportunities for engaging with complexity in education exist. Peace educators in India therefore offer an important opportunity to examine both the effects of globalization on education and to locate better and understand sources of resistance and creativity in generating responses to complexity in the field. These educators in their efforts to challenge neoliberal globalization through education take an eclectic approach to the field combining an interest in building peace with a deep concern for issues of development and an explicit understanding of the need to move away from mechanistic approaches to the field.

Development Education

A key argument in this chapter is that Development Education (DE), globalization, and peace education converge in India to create educational forms that are dynamic in their attempts to be responsive to local needs and the demands of global complexity. However, Educators in

⁹² Anil SadGopal, Sunil Sahasrabudhey and Banwari Lal Sharma all mentioned this divide in their interviews.

India are not alone in their efforts to address these issues of both peace and development. DE is a distinctive subfield within peace education and is widely recognized as a critical component of the field with active practioners around the world (Harris & Morrison, 2003). DE has generally been understood as a response to the massive inequalities that exist between the 'haves and have nots' of the world. DE initially was concerned with an emphasis on the relationship between 'developed' and 'developing' nations understood in part as a quest to establish an empathetic connection with those who are 'less fortunate.'

Recent interpretations of the field of DE have encouraged greater recognition of economic oppression at both the local and global levels and a corresponding need for genuine solidarity in challenging privilege in these larger systems (Aspeslagh et al., 1996). Mainstream contributions to the field of DE by organizations such as the World Bank, have increasingly been met with resistance within the field as both practioners and scholars have critiqued their approach as overly laden with interpretations of development, which frame people in the global south as deficient (Aspeslagh, 1996, p. 175). Robin Burns noted that DE is grounded in this critical pedagogy as it was developed in Latin America in the adult literacy work of Paulo Freiré and as such favors processes of self-empowerment and struggle (Burns, 2008).

DE's focus is arguably narrower than the larger field of peace education in that it has historically concentrated primarily on problems of economic inequity openly exploring the ways in which structural violence is created and perpetuated by international political/economic institutions and organizations and their mechanisms and policies (Burns, 2008). Development education thus seeks to understand international political and economic systems and the role of states, and corporations, in light of the distribution and control of food and basic resources, and

their role in providing (or not) equal access to those resources.⁹³ Development education endeavors to imagine a world free from poverty and in so doing, it examines alternatives to contemporary global political and economic systems. More specifically DE seeks to be responsive to the need for more just responses to the realities of increased population growth, environmental destruction, and greater consolidation of resources in the hands of fewer people. DE encourages students to learn about the problem of poverty and construct developmental strategies to address the effects of structural violence.

This broad mandate lends itself to a wide array of analysis and suggestions for building a more just and equitable world. Toward this end, developmental educators often argue for:

fair standards of working conditions, pay, living conditions, environmental concerns, participation in decision making, equality of the sexes, laws against child labor, fair trade agreements, technological progress, all... must be studied by youth, so that as they proceed to adulthood, they may play a vital role in the development of international economic global equity. (Heywood, 1999, p. 198)

From a complexity and education perspective, such ambitious goals are significant. They can push development educators toward the edge of chaos in novel ways as they are challenged to generate curricula and pedagogy that are responsive to the complex and shifting terrain of global socio-political forces.

While educators in India or even in the global south are not alone in this epistemic clash with hegemonic interpretations of globalization their location within histories of resistance to colonialism shapes their understanding of the importance of responding to these challenges. Anil SadGopal argued that such neo-colonial practices in education can have devastating effects as:

educational aims are being trivialized and curricular knowledge is either being reduced to mere literacy skills (for reading product labels and prices) or fragmented into bits of information or competencies for reading factory instructions, punching keys at the computer keyboard or accepting the dictates of the market uncritically. (SadGopal, 2005,

⁹³ Three decades of peace education around the world: an anthology By Robin J. Burns, Robert Aspeslagh.

p. 99)

From Sadgopal's viewpoint, this orientation in education leads to a gross oversimplification of the world in the service of generating a largely uncritical workforce (even within institutions of higher education).

The educators highlighted in this chapter contend that these struggles against mechanistic forms of education, which seek to maintain stability, control, and replicability, serve primarily to promote the economic goals of a global elite in the name of development. Both Sunil and Banwari have chosen to work as informal educators as they note that such critical discourse and praxis is of peripheral importance and often undermined within mainstream education. The efforts by these peace educators in India take place then, within alternative frameworks and educational spaces that seek to engage with the messy, contested and chaotic processes of globalization and the glocal networks of educators committed to decolonizing praxis (Parker et al., 2010).

In building on the focus of this dissertation on the connection between ontological and applied insights in response to global complexity, it is helpful then to examine the embedded experiences and practices of educators engaged in this work. I will begin with Vidya Ashram's programs and then move into an analysis of the People's Free University. This provides a rich opportunity to examine the challenges and opportunities that arise when generating educational programming that seeks to engage indigenous knowledge(s) and respond to global complexity. These efforts in India thus offer a rich site in which to explore development and peace education (and education more generally) on the edge of chaos.

Vidya Ashram: An Introduction

According to Sunil Sahasrabudhey a founding member of the Vidya Ashram, "to erect

the challenge to this (colonial education)...a new ideological movement is needed, which is based in the struggle of peasants and artisans and in their living traditions of knowledge.”⁹⁴ He stresses that this is “a philosophical campaign” in which ordinary people can “contribute fundamentally from many angles and in many ways.”⁹⁵ Sunil has dedicated his work to assisting in supporting such processes of engaging local knowledge and creating spaces where people from various epistemic backgrounds can engage in dialogue about fundamental issues related to knowledge in society.

I met Sunil Sahasrabudhey at the Vidya Ashram at the height of a heat wave in the Gangatic plane. Just the day before, in Varanasi, I had watched a power converter on a telephone pole ignite and shortly thereafter, we lost power for the fourth time that day due to extra demands as people tried to stay cool. It was so hot that no one moved about much during the day, congregating instead in the shadows to talk, sit together, and share food or a cup of tea and some conversation. The narrow lanes of the city were dotted with people on either side of the streets, some speaking passionately, others in more subdued tones in the mid-day heat. For long periods while the power was out, there were no televisions or radios playing and I watched in amazement as the voices, the intensity of the sun and this scene of this ancient city seemed to draw me back to a time thousands of years ago. As I made my way to the bus station, I was reminded of the fact that people had been living in this city continuously for millennia, and that they had survived thousands of heat waves like this one and far more trying ordeals than that. On this day, it was easy to muse on such issues as there were few distractions, and I was one of the few people moving about as I made my way to Sarnath the historic home of Gautama the Buddha and The

⁹⁴ This quote taken from interview in 2005

⁹⁵ Sunil Sahasrabudhe Agaria-vidya:A Link in the Philosophy of Emancipation accessed at <http://www.vidyaashram.org/papers/agaria.pdf>

Vidya Ashram program.

These reflections on temporality were timely realizations that I more fully appreciated later when I spoke with Sunil as he had much to say about the long history of India and the depths of knowledge that had grown out of the lived experience of many generations of people in this area. It was clear that Sunil had a passion for learning about the diverse and robust systems of knowledge that people draw on in India to meet the challenges and opportunities of their lives. When I first arrived, he met me wearing only a dhoti⁹⁶ and a smile and he immediately offered me a cold drink and suggested we head to a shaded area to sit and chat. I had met his nephew at a conference on nonviolence in Los Angeles some months before, we were roommates there, and when I heard of Sunil's work in India I jumped at the opportunity to interview him.

Sunil asked me a series of questions before I could ask him any and the talk twisted and turned in dynamic fashion as we spoke for several hours, sipping hot chai, which somehow cooled us off as time passing without either of us noticing at all. He pointed to the cup of chai, noting that it was an old recipe and that it has spices that cool the body, laughing "you appreciate that don't you today and it tastes good too." He further noted the clay cup, he again laughed and pointed raising his voice and saying with a mocking smile, its "recyclable" as he smashed it on the ground, he explained that this was the traditional container, "it's made from local clay." He quickly demonstrated how an idea of local economy and green-friendly wares was something that existed in some forms within local knowledge systems for many centuries.

We spoke about many topics during the first hours of our open dialogue, conversation wondering and reconnecting in unexpected places as it so often does, and we eventually landed on the topic of poetry. I write poetry I explained and he smiled and laughed sharing that two

⁹⁶ The dhoti is a rectangular piece of unstitched cloth about five yards long, wrapped about the waist and the legs and knotted at the waist

poets were currently at the Ashram, one visiting from the south and another who lived there.

“Tonight under that tree,” he pointed “we will have a reading in three different languages, as has been done for time immemorial. It is an important way for knowledge to be shared,” he exclaimed! Then he asked if we should begin, and I agreed. He started by saying “we want globalization of a different kind” and went on “our work here is to challenge it as a universal idea; there is nothing universal about it, we are talking about changes in economics, politics, and philosophy that have [largely] taken place the last 25 years.” He emphasized that history extended far beyond the past few decades and that rich scientific and intellectual traditions in both the east and west existed well before this period. Those lineages he contended continue to inform and enrich the lives of billions of people around the world today.

LokaVidya translates into ‘peoples knowledge’ and Sunil contrasts that with western ‘scientific perspectives,’ which privilege certain cultural perspectives and types of information especially that which is abstracted away from place, communicated in English and represented in spaces far away from the context in which it was generated (often these days through the Internet). People’s knowledge he contends is integrated deeply into place and to systems of meaning, which is often not understood by people operating within such scientific cultural frameworks and so when people’s knowledge is taken away from the place in which it is generated and thrives, it is at a distinct disadvantage. Anil contends that the heart of the work that takes place at the Ashram is to engage with and promote the idea of LokaVidya. In his in-depth critique of western scientific ideas and their dominance of what he calls the current knowledge system, he contends that science “is viewed as the least contaminated...[the most] rational.” He challenges this view arguing that people’s knowledge operates with a different sense of rationality, which embodies the importance of context and holism and can provide a

self-correcting force in relation to creating greater equity in society. The Vidya Ashram's programs seek to disrupt the representation of local knowledge as dead approaches and to challenge hegemonic epistemic claims forwarded in universities and popular in contemporary Indian political discourse, which tie artisan and agrarian practices and epistemologies to an antiquated past.⁹⁷

Sunil and the other activists at the Vidya Ashram are troubled particularly by what they see as a prevailing belief that scientific inquiry in the service of market forces will lessen the widespread inequity present in India. Rather they are not alone in identifying such approaches as central to enduring inequity as Professor Anil SadGopal contends when arguing, “in a society like ours which is characterized by disparities at all levels—social, cultural, linguistic, gender, regional—any agenda for uncontrolled standardization, both within and across nations, promotes unequal development and further denial of justice” (SadGopal, 2005, p. 103). Vidya's epistemic critique underscores the practical need to challenge the political and social assumptions embedded in much globalizing rhetoric by creating spaces for people to encounter alternative knowledge systems.⁹⁸

Brief Overview of the Vidya Ashram's Programs

This section contains a summary of the main programs of the Vidya Ashram and offers a

⁹⁷ As I traveled across India for my research, I often met college students on the trains and this topic came up. They expressed astonishment over my interest in popular education in India. They would look at me quizzically, wondering why I would travel all that way to go to “backwards” [rural] places to learn about education when the US had the most technologically advanced universities in the world. The majority of students I met wanted to be engineers, software designers or be employed by the medical industry. When they found out, I also was interested in nonviolence they often shared their critique of Gandhi's perspective emphasizing in particular the irrelevance of such views, which privileged cottage industry and shunned industrialization and by association modern industrial education. From their perspective this was exactly what was “holding India back,” as a market economy demands technological expertise and an educational system that can prepare learners for the demands of a global economy.

⁹⁸ These claims made by the practioners at the Vidya Ashram for the need for epistemic resistance and imagination echoes those made by alternative globalization proponents, indigenous rights activists, and other dissident voices from both the global north and south that are leveraging similar critiques (Gliddens, 2003). Sunil is well aware of this larger network of practioners globally, as he and members the Ashram have participated in opportunities to come together with other activists such as the world social forum and other conferences and events.

deeper window into the ontological orientation of those working at the Ashram. It provides the necessary groundwork for considering some of the practical opportunities and challenges that arise because of their libratory ambitions and attempts at generating pedagogy that more effectively can generate knowledge that is responsive to global complexity. While knowledge production is at the core of the Vidya Ashram's mission, they conduct most of their programs in informal educational spaces and often identify their efforts in adversarial relationship to mainstream educational approaches.

Vidya is the ancient Sanskrit word for knowledge and Sunil makes a point to explain that it still is used commonly throughout India, "otherwise we wouldn't have used it" as "we are committed to creating a far-reaching dialogue in Indian Society." According to a *Dialogue on Knowledge in Society*, which was written by Sunil and others at the Ashram, "the concept of LokaVidya as a central concept around which emancipatory thinking and programs of social transformation need to be organized took shape in 1995" (Sahasrabudhey et al., 2006, p. 3). The publication explains that "the thought and activity of the Ashram is proposed to be focused on Vidya, understood somewhere in the interaction of knowledge, science, art, language, philosophy, wisdom, reason, faith, and others. The Ashram is a place where many people interested in Vidya come. They come because they want to contribute to the ashram by their ideas, by participation in the dialogue. The Ashram honors the visitors equally; peasants, artisans, intellectuals, women, advasis (tribal people), scientists, artists, administrators, statesmen, are all seen as epistemic beings" (Sahasrabudhey et al., p. 3). The Vidya Ashrams conducts programs that seek to generate dialogue about the topic of LokaVidya and they have three main programmatic threads.

First they facilitate dialogue with artisan, farmers, small business owners and others who

they see as being closest to LokaVidya and in touch with the knowledge that is produced because of the activities of ordinary life and that “there is a great store of knowledge that exists outside the university” and is marginalized on the Internet.⁹⁹ This program is entitled Kisan Peeth. Kisan Peeth is centered on a series of discussions held about knowledge production and the new economy and these events often seek to highlight the conflict between local knowledge/practices and ways that governments, universities and the new knowledge elite devalue LokaVidya. These discussions in communities are facilitated by members of the community. For example, if a dialogue is being convened with a village that has a long-standing tradition of weaving and developing knowledge around those practices, someone from the community who is a weaver will take the lead on facilitating that conversation after consultation with the larger Vidya collective.¹⁰⁰

The Vidya Ashram also facilitates multi-stakeholder dialogues on people’s knowledge at the Ashram campus where core members of the Vidya Ashram collective convene discussions that often involve people from knowledge production backgrounds that are ‘more formal’ (the university). The Vidya Ashram also hosts workshops aimed at both domestic and international participants that have occurred off their campus but are not part of Kisan Peeth as they did at the World Social Forum in Mumbai.¹⁰¹ Amit Basole explains, “we seek to bring into dialogue and concerted actions all those who are struggling against knowledge hierarchies and enclosures.”¹⁰² Finally, Vidya also produces a variety of publications aimed at creating more far-reaching

⁹⁹ The idea of the knowledge of everyday life, which Sunil stressed also articulated in Amit Basole’s talk at the Wikipedia conference, march 2010 <http://www.vidyaashram.org/videos.html>

¹⁰⁰ Ibid

¹⁰¹ Details about the workshop entitled “Knowledge Dialogue” can be found in the publication http://www.vidyaashram.org/papers/VA_Report_05-06.pdf Videos can be accessed at <http://www.vidyaashram.org/videos.html>

¹⁰² <http://www.vimeo.com/10800206>

discussion on epistemic diversity and the importance of LokaVidya in India today.¹⁰³ They have recently released a series of online video on the topic to reach a wider national and international audience.¹⁰⁴

While the Vidya Ashram hosts ongoing dialogues on their campus in Sarnath, through their program Kisan Peeth they also often engage with people in the places where they live and work. They invite other people interested in the conversation of LokaVidya to join in these conversations. These programs are most often conducted in rural settings and the members of the Vidya Ashram have long standing relationships, which they refer to as “peasant’s and other people’s movements” in India. Part of Vidya’s approach is to draw on these networks, both in terms of gaining access and building relationships over time with people who are “LokaVidya holders.”¹⁰⁵ Kisan Vidyapeeth is grounded in the belief that face-to-face exchanges on farms, in villages, in cities across India, with people who have rich epistemic traditions that have developed “in the act of living and meeting their needs” offers an important site for resisting knowledge hegemony and creating more pluralist knowledge practices.

Vidya Ashram’s efforts to engage with local knowledge in response to global complexity in support of creating more just, equitable and ecological sustainable social systems poses important questions regarding the best approach through which to catalyze diverse epistemic responses to global complexity. The Ashram’s critique of knowledge practices and the alternatives they posit in India closely resemble those levied by academics who favor community-based participatory research, which emphasizes the role of the co-production of knowledge (Wallerstein & Duran, 2003). Parker, et al. draw on Hale’s (2001) work about activist

¹⁰³ http://www.vidyaashram.org/papers/VA_Report_05-06.pdf

¹⁰⁴ <http://www.vidyaashram.org/videos.html>

¹⁰⁵ Conversation with Amit Basole Dec 19, 2010.

research pointing out that such alternative knowledge production need be “at each phase from conception through dissemination, in direct cooperation with an organized collective of people” (Parker, et al., 2008, p. 12).

The Vidya Ashram is worthy of examination from a complexity and peace education point of view, as they have continually adapted their educational practices and discourse in an attempt to involve more participants and respond to the ontological demands of complexity and the values of peace and social justice education. Yet while these discursive and epistemological commitments are important in terms of informing action, the actual task of co-constructing educational and organizing processes is fraught with challenges. Most notable in this regard is the challenge not simply to reproduce colonial power relations and educational schemes grounded in oppressive relationships and mechanistic approaches but to find ways to engage with and catalyze the diversity of LokaVidya and in challenging social injustice and knowledge hegemony.

The members of Vidya ashram agree that this larger project continually critically redefining knowledge through collective reflection, action, and research is central to their mission of supporting LokaVidya and is no easy task. Sunil highlights the limits of the Ashram’s role as catalyst for local knowledge arguing that LokaVidya has “its own inherent mechanisms for survival” noting that the mere existence of these perspectives, the fact they exist and continue to thrive is a testament to their strength in the face of oppression. Arturo Escobar’s account of resistance in Latin America highlights this strength, which he contends:

cannot be understood without reference to the coloniality of power that accompanied it, and that entailed the marginalization of the cultures and knowledge of subaltern groups. This conceptualization allows one to see how the local histories of European modernity have...produced global designs, within which subaltern groups have had to live; it also makes understandable the emergence of subaltern knowledge(s) and identities in the cracks of the modern colonial world. (Escobar, 2008, p. 162)

Members of the Vidya Ashram and those involved with the LokaVidya seek to nurture and expand those subaltern knowledges and identities and to move them toward the service of a more equitable and humane society. From Vidya's point of view, nothing is more dangerous than the idea that globalization is a fixed entity, lurching forward with an unintermittible destiny. What is needed instead they contend are educational practices that do not reproduce colonial relations but rather make space for critical voices and greater epistemic diversity. Consequently, the Vidya Ashram has sought to engage with complexity by developing participatory pedagogical processes in addition to exploring this critical discursive domain. However, as Amit Basole pointed out while Vidya has made progress in terms of developing an adaptive body of praxis that seeks to engage local knowledge systems in responding to the demands of global complexity, such approaches are often "easy to talk about and difficult to do."¹⁰⁶

Pedagogy in the Struggle for Epistemic Complexity

The Vidya Ashram's main pedagogical strategy for supporting epistemic complexity in response to the demands of global complexity is to engage communities that often are marginalized in conversations about the importance of alternative knowledge production processes and of the need for critical approaches to neoliberal perspectives. Their approach differs from many mainstream educational endeavors in that they seek to be responsive to the context in which they facilitate and to draw on vital sources of energy present within subaltern knowledge systems. Because of these demands, the peace educators at Vidya have developed approaches to praxis that they hope will multiply pathways for feedback by creating open spaces for people of diverse backgrounds to come together as equals and for all of those who join these conversations to have an opportunity to participate in knowledge production. Different than the

¹⁰⁶ From interview 2010

one size fits all approach to modern education examined in chapter two, these educators faced ongoing creative challenges in their praxis as they sought to nurture durable pedagogical processes and educational spaces while at the same time tending to new pedagogical and curricular possibilities vis-à-vis the demands of living and working within a rapidly globalizing country. Their work therefore provides an opportunity to examine the challenges and opportunities of peace education on the edge of chaos in India.

The Vidya Ashram's intentions to engage with and support local knowledge raise a number of critical and practical questions in terms of analyzing their pedagogical approach and orientation toward complexity. Those questions include: how can researchers and activists facilitate deep encounters with local knowledges? Are the members of the Vidya Ashram bearers of LokaVidya? If the goal is supporting local knowledge, how does one know when it is present? Who decides? How should 'dialogue' be conducted? Further, who leads the discussions? How can they ensure that the conversations are not dominated by those who have more formal education or who feel more comfortable in a specific space? Who decides which questions will be pursued by the group and through which processes? How are such sessions documented? How are information and learning from the sessions shared, if at all? With whom is it shared?

While this dissertation has advanced the argument that educational responses to global complexity are needed in meeting contemporary demands as the questions above suggest, in practice this is a challenging task. The Vidya ashram's approach aspires to be in alignment with a complexity-inspired ontology insofar as they recognize knowledge as a distributive phenomenon that as David and Nadia Kennedy point out can be accessed effectively through "distributed thinking, distributed intelligence, and distributed authority" (Kennedy, *complicity*, p. 11). This commitment to participatory approaches is also consistent with the popular

education/peace education literature featured in chapters three and four (Friere, 1970; Illich, 1973).

In employing these dialogical pedagogical processes, Vidya attempts to be intentional about involving people in these dialogical processes and the ways in which they generate semi-durable pedagogical approaches for facilitating knowledge production. Toward this end, one technique they use (in addition to offering an overt framing of the need for equality and complexity in dialogue processes) is to create the space for multiple standpoints to emerge at the start of their discussions. They begin with participant seated in a circle and open with an opportunity for each member of the group to offer a statement in response to the topic that ashram members provide (e.g., ‘LokaVidya and water management’ or ‘the walls of the university must come down’). Each person gets roughly equal time as indicated by the convener of the session to share their personal response to the theme (although in practice, their sharing is not timed and it is rare that people are asked to end once they have started speaking). The goal is not for participants to address each other at this phase of the process but rather to offer what they see as the most important contribution they have to make on that particular theme taking into consideration what already has been said. The thematic terrain suggested by the facilitator at the beginning of the conversation is not understood as the best frame for the conversation but simply as a starting place.

The main purpose then is to initiate conversation and multiply opportunities for feedback in relation to theme of LokaVidya, to (re)-discover collectively the relevance of local knowledge in these times. These limiting constraints (topical suggestions) and basic pedagogical structure (everyone seated in a circle starting with one person speaking at a time moving around the circle) however are not understood by the conveners necessarily to mean that sessions will unfold in the

ways in which they have imagined.¹⁰⁷ Rather, Sunil contends that what comes from that conversation is both generative and unpredictable and he expressed a sense of acceptance in relation to these processes, which have a high degree of variability.

This co-emergent approach born of the ‘curricular content’ generated by the ashram members and the continual engagement with the community has not only influenced the way that the Vidya Ashram frames the importance of LokaVidya (the content) over time but also the pedagogical processes used during these sessions. For example, their focus on local knowledge and participatory processes led them to shift their structure by having members of the community in which they were convening discussions be the lead facilitator for these sessions (instead of Ashram members). They then needed to develop a process whereby community members/experts (for example, a weaver) could visit the Vidya Ashram and engage in the discussions prior to the community dialogue. Members of the communities who visited the Ashram would then discuss and shape the framing of topics for the group discussion. Sunil and other members of the Ashram hoped to engage more effectively with the epistemic insights embedded in the practitioners’ understanding of their area of specialization (for example of weaving) and how that perspective connects to the larger knowledge paradigms those practices are embedded within (local paradigm). Ashram and community members then discuss how this orientation can bear on contemporary social issues in India and the best ways to engage the community in those conversations.

These community facilitators also convene the sessions in the local language (a shift from when Ashram members originally convened the discussions in Hindi or other regional

¹⁰⁷ Amit Basole stressed this point in my interview with him in December.

dialects).¹⁰⁸ This adaptation to sessions facilitated by local people in local languages was in part a response to feedback from participants about their own frustrations in terms of not seeing the connections between their immediate pressing struggles for land rights, democratic participation, economic autonomy, etcetera, and these meta-conversations about knowledge in society that Vidya was interested in facilitating.¹⁰⁹ This pedagogical adaptation was initiated by perturbation, as local people highlighted the gap between Vidya's knowledge agenda and the embedded experiences of participants. Vidya sought then to bridge that gap by learning more about the particular knowledge practices in these communities and finding pathways for greater feedback and participation from participants.

Reuben McDaniel, Michelle Jordan, and Brigitte Fleeman underscore that complexity theory suggests that while systems are full of surprises and able to adapt they are “time dependent” as “the direction they take at any given point is a function of the system's previous behavior” (McDaniel, Jordan & Fleeman, 2003, p. 270). In terms of understanding the emergent potential of people's knowledge systems, members of the ashram were challenged to reframe their engagement with the community in light of their commitment to participatory approaches that are relevant to the lives of participants. Vidya increasingly involved community members in both the framing and facilitation of discussions and they reported that they gained greater access to and synergy within the specific historical and social context in which people's knowledge was adapting to the demands of global complexity because of such changes.

Members of the Ashram were challenged in their pedagogical approach to bring their methodologies in alignment with their dissident perspective on ‘traditional knowledge systems,’

¹⁰⁸ Well over one thousand ‘mother tongues’ are used in India: For more information see: <http://www.languageinindia.com/aug2002/indianmothertongues1961aug2002.html>

¹⁰⁹ Follow up conversation with Amit Basole.

which they (in theory) already conceived of as constantly adapting and evolving and thus not locked into some finalized ‘traditional’ past. However, ironically their commitment to advancing LokaVidya as a discourse meant ashram members began with a relatively rigid framing of the issues surrounding LokaVidya, which was disturbed by the complexity of viewpoints that emerged when they facilitating these discussions. Thus while the curricular boundaries are partially delineated from more closed conversations at the Ashram with a far smaller number of participants involved, these conversations are continually influenced by the permeability of the process they had instigated in the communities and the interconnectivity and fluidity of the identities of all the participants involved. Vidya’s pedagogical approach reflects the dynamic tension discussed in the complexity and education literature and highlights the continual interplay of durable structures and processes and the forces of change within multiple complex adaptive and interconnected systems (Trueit, 2005).

While challenging, Sunil, Amit, and the other associates of the Vidya ashram emphasize the importance of being continually responsive to the feedback generated in these sessions to remain on the edge. Complexity and education theorist, Keith Morrison (2008) noted the importance of this central commitment to feedback within complexity-inspired education and how widely supported this view is in the literature: “Feedback must occur between the interacting elements of the system. Negative feedback is regulatory (Marion, 1999, p. 75). Positive feedback brings increasing returns and uses information to change, grow, and develop (Wheatley, 1999, p. 78); it amplifies small changes (Stacey, 1992, p. 53; Youngblood, 1997, p. 54)” (p. 17). Such approaches within education are not without risks and Basole noted that these pedagogical techniques of providing an opportunity for each person to speak, of having local facilitators and of facilitating in the local language have emerged from iterated practices over

time and from many conversations, which simply “fell flat.” Accordingly, even these core pedagogical structures are in flux and the facilitators and team members at Vidya are engaging in a creative struggle to work with what emerged in these conversations. In the Vidya Ashram’s approach, conversational and dialogical processes provide some level of pedagogical consistency over time although the social technologies and conditions that enable such conversations to flourish are consistently being reevaluated by the Vidya ashram collective and its allies.

While Vidya struggles to respond to dynamic, complex, and continually changing contexts, their orientation toward pedagogical adaptation is significant as they offer an applied body of work for considering education that is responsive to the demands of complexity. In this thesis I have argued that such approaches that embrace change often run contrary to the language of control, repetition, and evaluation, which has been so highly valued within mass education and modern approaches to the field. This does not imply that such approaches easily are understood and worked with in practice but rather that they can be more in keeping with the complexity of the world. In terms of complexity-inspired educational praxis, Truit contends that this ontological move away from linearity and simplicity suggests a logic of interpretation, which emerges from both “doing and becoming” (Doll et al., 2005, p. 90). This engaged pedagogical and reflexive practice is at the heart of Vidya’s attempts at deeper epistemic transformation.

In chapter four, dialogue and conversation were discussed in light of their potential for catalyzing epistemic complexity. While these approaches are widely recognized as important within the complexity and education literature (Kennedy, 2010; Truit, 2005) Vidya’s approach to conversational leadership (Brown, 2010) is made more difficult and perhaps rich given the demands of collaborating with various local facilitators and seeking to multiply stand points by ensuring community participation. The simple practice of an individual sharing to begin each

conversation creates a degree of variability and unpredictability that at times can allow for greater responsiveness to the dynamic context in which they engage. This kind of approach makes it difficult to impose strict curricular mandates on these sessions or to seek preordained outcomes. Instead, in certain pedagogical moments it makes possible adaptive praxis, which as Bill Doll noted involves, “a dynamic, emergent curriculum, transformative in its processes, (that) sees both the learner and the curriculum...having their own voice. The point counter point of this duet/dialogue with practice and over time, produces transformative results” (p. 55).

In retrospect, it was difficult for members of the Ashram to predict how these conversations would develop. In terms of what emerged from the process the facilitator often played a critical role in choosing how to respond to these situations and Vidya Ashram has no predetermined protocol for these situations. Rather, they draw from a wide range of facilitators in their network and each brings their own approach and ways in which they intervene (or not) given the context of each session. Amit Basole noted that overt discussion of intervention by facilitators may be a blind spot in relation to Vidya’s self-reflexive processes. He contends that pedagogy often is played down because the Ashram’s leadership comes from political organizing backgrounds rather than educational backgrounds, and they tend to privilege the importance of thematic content over the processes through which such content is generated.

Correspondingly, self-reflexivity in terms of educational practices does not appear in the Loka Vidya literature and was not mentioned by Sunil in our interviews. However, Basole noted from his doctoral research project examining the Ashram that such conversations or ‘debriefing’ of pedagogical processes do occur but in less explicit ways than in ‘western contexts.’ Conversations about praxis according to Basole are integrated into the daily life and workings of the Ashram. Basole noted for example, that after each community session members of the

Ashram discuss how the conversation went and in addition to highlighting what was said (content) in the conversation people reflected on the quality of participation, the processes that were used and what did and did not work in the context. According to Basole these conversations can continue for days.

In all, the Vidya Ashram seeks to enter into the complex systems that feed LokaVidya and to engage with and learn from these local knowledge systems. Their sense of the dynamism and unpredictability that results from such work within multiple complexes, open and inter-related systems is largely in keeping with a complexity approach to the field. The ontological insight of the educators at Vidya echoes the work of the complexity theorists featured in chapter two who make a case for adaptive praxis in response to complexity. John Julien encapsulates this notion well when writing, “education is...complex in the still emerging sense...it is a recursive open system characterized by emerging entities, the evolution of new capacities and developmental growth” (2006, p. 101).

Members of the Vidya Ashram acknowledge their projects as works in progress and embrace an adaptive model for educating on the edge of chaos as they continually seek new pathways for engagement. Central to their approach is accessing community-based sites of knowledge production and the messiness of participatory pedagogy in catalyzing conversations in those spaces. However, the members of Vidya also seek to engage increasing numbers of people around the world in dialogue about the rich contribution of local knowledge systems. They echoed Linda Tuhiwai Smith’s contention that “meaningful, rich diverse, interesting lives are lived at the margins; these are not empty spaces occupied by people whose lives do not matter or people who spend their lives on the margins trying to escape” (Smith, 2006, p. 159). Arturo Escobar advances this claim noting that what is found in those spaces where local

knowledge lives is a “deeply negotiated reality that encompasses many heterogeneous cultural formations” and thus the ‘periphery’ offers highly generative spaces (Escobar, 2008, p. 163).

While members of the ashram acknowledge that greater resources can be devoted to analyzing the complex pedagogical dynamics at play during dialogue sessions, their experience working with communities over time has moved them toward more complex and participatory pedagogy. This is consistent with their values and offers a counter example when compared to the “dehumanizing” tendencies that Linda Tuhiwai Smith pointed out in relations to colonial approaches to education. While the ashram members tend to be more explicitly concerned with thematic content they have developed an emergent and adaptive pedagogy over time that is changing because of the complex interactions of Vidya’s associates and allies within and across multiple diverse learning locales. These embedded and dynamic relationship between the ‘local’ and ‘global’ corresponds with Held and McGrew’s account of the epistemological work of global social movements which are “delegitimizing and contesting the existing order, by highlighting its contradictions through local struggles at multiple points in the global system and bringing to public attention its lack of legitimacy” (Held & McGrew, 2002, p. 149) or at least the limitations of its totalizing narrative. The next section examines the challenges and opportunities of the LVM’s attempts to raise consciousness about these local struggles and to involve increasing numbers of people in their educational movement.

Global Connectivity and Local Knowledge

In terms of examining the Vidya Ashram’s response to the demands of complexity, a critical component of their approach involves an attempt at decentralizing knowledge production. They seek to do so by creating more complex pathways for collaboration and communication and they operate within multiple alternative pedagogical spaces. However, as the previous

section examined the Vidya Ashram ‘campus’ also serves as a hub for self-reflexivity in terms of analyzing the dynamics of engaging within and between these various local knowledge production sites. This approach to education illuminated some of the dilemmas that practitioners face when moving toward the edge of chaos. This tension is felt by members of the Vidya Ashram who seek to be responsive to these dynamic community contexts and yet also often struggle to involve community members in the reflexive and design work taking place within the walls of the ashram campus.

These challenges are not unique to the work of the LVM, as this author has argued that education on the edge chaos requires the continual creative capacity to both nurture durable pedagogical processes and adapt to the complex and changing field of possibilities embedded within the glocal context. Therefore, maintaining a commitment to complexity in knowledge production is neither a simple nor an easy task, as Paul Cilliers summarized well when writing, “connectedness requires a distributed knowledge system, in which knowledge is not centrally located in a command and control center. Rather, it is dispersed, shared, and circulated throughout the system: communication and collaboration are key elements of complexity theory” (Cilliers, 1998). The Vidya Ashram takes up this challenge for generating and sharing knowledge through collaborative pedagogical processes and sees its sphere of influence extending beyond the local and regional conversations they have convened to include exchange within transnational networks of resistance to mainstream globalization.

This section then deepens this exploration of Vidya’s response to global complexity by examining some of the challenges and opportunities that LVM faces when trying to maximize learning within this complex system of changing relations. While the LVM base themselves outside of universities and affluent urban areas which Ashram members contend are often

viewed as cutting edge places for knowledge production/consolidation, they seek to create a type of mobile grassroots research center that can traverse and connect diverse locales where they believe peoples knowledge grows and flourishes. This however does not mean that they are immune to approaches that privilege an intellectual vanguard or that they do not shut down pathways for participation. While this chapter has highlighted some of the ways that connectivity brings with it both possibilities for perturbation, feedback and ultimately growth in response to complexity, such a commitment also poses serious challenges in terms of tending to such distributive processes of knowledge production in ways that are genuinely participatory.

In terms of creating a more widespread dialogue on the importance of engaging with the embedded ethics, epistemology and practices of local knowledge, members of the Ashram try to reach growing numbers of people by utilizing the opportunities afforded by increasing global connectivity. They reach out to people from diverse backgrounds globally about the specific epistemic contributions of LokaVidya through three main pathways: 1) generating publications on the theme; 2) engaging in global gatherings of activists; 3) educators and posting videos online about the topic of LokaVidya. Through these efforts, they are working to generate a critical mass of people who are aware of the value and contribution of local knowledge and who can help influence cultural, economic, and political changes that are supportive of their struggles.

The Vidya Ashram then is continually in search of pathways for reaching and engaging increasing numbers of people. In so doing, they engage with computer-mediated technologies in posting their publications, reaching out to contacts globally and finding out about and participating in gatherings of activists in real time. An element of their work then is to build a sense of solidarity and interest across multiple nested networks of possible affinity. However, while Sunil, Amit and other members of the Ashram identify these efforts engaged at outreach

and wider engagement as critical to achieving their aims they do so with a sense of trepidation acknowledging deep concerns about these modern mediums of communication and new media as spaces and pathways for engaging with local knowledge.

These concerns were elucidated in general terms in January 2004 in preparation for the World Social Forum (WSF) in Pakistan when they published *A Dialogue on Knowledge in Society*. In that publication Sunil Sahasrabudhey, Avinash Jha, Tenzin Rigzin, B. Krishnarajulu, K. B. Jinan, Ananya Vajpeyi, K. R. Krishna Gandhi, Amit Basol and Girish Sahasrabudhey argue that people's knowledge, which is grounded in peoples lived experiences and specific locals of knowledge production over many generations is the "chief object of exploitation in the Knowledge Society."¹¹⁰ Sunil and the team of writers lament the ways in which the information revolution privileges certain forms of knowledge, often discounting voices from the periphery by bringing them into the liminal spaces of the Internet and decoupling them from the people who produce such knowledge.

These authors explicitly express their sensitivity to the power dynamics of re-presenting local knowledge in virtual spaces. Yet, while they put great emphasis on participatory pedagogies in engaging with local knowledge in their community conversations they have not explored as widely the possibilities for seeking participant input in their writing processes, public speaking, video segments or wider distribution efforts. This is significant as the educators at the Vidya Ashram emphasize that the local conversations have and will continue to play transformational roles in terms of the development of pedagogical/knowledge production process and the priorities/thematic content of the LokaVidya Movement. However, the role of broader

¹¹⁰ See <http://www.vidyaashram.org/papers/6Dialogues-PracticalApproach.pdf>

participation in the ‘translation’ process¹¹¹ has been explored only marginally.

LVM maintains that broad participation has resulted in changes in their praxis in powerful and often unpredictable ways in response to their community conversations. Yet the same opportunities for broad participation are not perceived by Sunil and some of his colleagues at the Ashram regarding the dissemination efforts of the Ashram. This lapse in engaging with complexity is problematic as it cuts the organizers off from vital sources of energy within the many learning communities to which they are connected. It also runs the risk of reproducing the colonial educational relationships they have tried to distance themselves from as they may be speaking for or about people in ways that are misleading or simply discounting local knowledge without processes for feedback and accountability. They struggle then to generate processes that challenge without reproducing colonial ways of thinking through reifying an intellectual vanguard at the Ashram. One of the Vidya Ashrams greatest challenges lies in their efforts to represent accurately the dynamism, complexity, and richness of the processes they are embedded within and to involve people in those processes.

These challenges of engaging with complexity and continually being responsive to the epistemic opportunities within and between multiple interconnected knowledge systems are endemic in complexity-inspired praxis. As Nadia and David Kennedy point out, “there are oppositional and dysfunctional tendencies within any system” and education on the edge of chaos intensifies the creative tension between the inclination to maintain the status quo in light of emerging opportunities for adapting praxis. While there may be good reasons continually to seek new methodological approaches for engaging with complexity, in practice educators may feel

¹¹¹ I use translation here to refer to the work of summarizing and synthesizing findings, making meaning of experiences and representing the movement’s efforts. However, it can take on a double meaning as these outreach efforts usually are done in English and so they are literally translating what has happen and what they think was said.

overwhelmed by the demands on their time, and challenges of implementation with too few financial and other resources.

Considering these and other challenges that the educators at the Vidya Ashram face they offer a rigorous and well-developed body of work for engaging with complexity. LVM offers insights into the conceptual understanding and social technologies needed to begin to engage with the complexity of local knowledge systems and processes for bringing those systems into conversation within transnational networks of affinity and interest. While their approach at times lacks the reflexive capacities to grasp complexity fully, their approach often is in keeping with a complexity-inspired approach to education, which seeks to engage with the chaotic and emergent implications of responding to the global complexity. In their work, they present an alternative and more nuanced view of global complexity, one that while incomplete, includes the dynamic and adaptive existence of local knowledge systems-systems, which are continually growing, changing, and alive and as such, are rich sources of learning.

The LVM is not the first attempt to catalyze knowledge production outside of formal educational environments in hopes of influencing deep political and epistemic changes in India. Sunil noted in his interview that Mahatma Gandhi successfully integrated “survival knowledge during colonial times” into his movement nearly a decade ago. Those survival strategies like weaving cloth, “were not rejected as backward or irrelevant” by Gandhi but rather were drawn on with great success to develop village level political resistance and education systems and devise strategies to overthrow the empire. Equally important from an epistemic point of view, the freedom struggle in India sought to develop confidence in the village people’s ways of understanding the world. The People’s Free University (PFU) much like the LVM has been influenced deeply by these Gandhian ideas of epistemic resistance and they have recently begun

to create a parallel free community-based university system in India aimed at responding to some of the demands of global complexity. This next section explores PFU's attempts to generate curriculum and pedagogy that is adaptive to community knowledge systems and supports the exploration of critical views of neoliberal globalization.

Swaraj Vidyapeeth (People's Free University)

Introduction

The People's Free University was founded a decade ago with the intention of helping people understand "the characteristics of present corporatized education" and to "offer and alternative and struggle" in the people of India's ongoing efforts for poorna swaraj (independence). PFU provides tuition free courses hosted in local communities throughout India through a network of affiliated educators. They offer established core curriculum materials that have been generated by academics and activists, which they refer to as the "general graduate course readers" to those local communities.

Swaraj was a term Gandhi used, which referred to self-rule and Gandhi employed this idea in very broad terms to speak both of India's political and economic independence from British rule and of the efforts of people to be self-sufficient as individuals and as local communities. Vidya is a Sanskrit word meaning knowledge and was used by the Vidya Ashram to highlight the central role that political power plays in holding up or delegitimizing what counts as knowledge. Swaraj Vidyapeeth then refers to a sense of self-rule in the area of knowledge, of both generating and taking back knowledge production and redefining it in the contemporary Indian context.

PFU was founded by Professor Banwari Lal Sharma, a retired Mathematics Professor who taught at Allahabad University. He also traveled extensively throughout India during that

time working with and organizing activist groups on a wide range of social and environmental justice issues. Lal Sharma considers himself a Gandian and he served as an honorary Director of Institute of Gandhian thought and Peace studies, (Gandhi-Bhawan) at Allahabad University from 1989-2006.¹¹² To further efforts to challenge neoliberal globalization and create a wider critical and reflective dialogue around social justice issues, Lal Sharma joined with his longtime friend and comrade Vandana Shiva and a group of academics from across the country in building the PFU.

According to Lal Sharma, they joined to generate spaces where honest and informed dialogue could occur about contentious social issues. After having worked within higher education for years, they deliberately choose to work outside of those institutions. Lal Sharma contends that those spaces are too constrained to be able to chart the kind of radical “new direction” that he believes is needed in India. The Swaraj Vidyapeetha literature makes this position clear stating, “mind-enslaving education that started during British colonialism, not only continues but has further been insinuated deep into the system under present corporate globalization.”¹¹³ Doctor Sharma and the others hope instead “Swaraj Vidyapeeth will serve as a free institution to help understand the characteristics of the present corporatized education, offering an alternative for “establishing our long cherished dream of Poona Swaraj” (Graduate Reader, cover).

In this context, the term free within the title of the People Free University takes on a double meaning, referring both to examining critically the effects of social and economic forces on people’s lives and their sense of agency as well as the absence of fees for students. PFU has developed curriculum materials that are offered for nothing more than the cost of printing and

¹¹² Some of these biographical details are also available online at the Orissa Mathematical Society website: <http://www.omsonnet.com/main.php?item=8&slno=2>

shipping. That cost is 250 rupees for the year, per group, which is about 6 US dollars for all six readers. The university is also 'free' in that it does not have funding from any large organizations and is community- and volunteer-based and so is free from some of the constraints of traditional state and private schools and the agenda of those who fund those programs.

One of the central goals of PFU is to create a national alternative education movement. They have reached out to groups across the country and have intentionally sought to create regional clusters of affinity and interest between groups interested in community-based 'graduate courses' on alter-globalization. While groups meet locally within various regions these groups are part of a larger network of groups in each region using the same materials to foster discussion. PFU's model includes opportunities to meet with other groups and cross-pollinate ideas at both the regional and national level.

The program structure is minimalist insofar as Lal Sharma and those involved at the Free University provide readers to local groups and not much in the way of pedagogical guidelines. The content is meant to serve as a jumping off place for dialogue within the group and there is a sense among PFU's organizers that by drawing from local activists, community organizers, academics and social movement networks, participatory processes will gain momentum in these self-organizing groups. PFU hopes their readers curricular materials catalyze epistemic diversity by providing not only a critical account of neoliberal practices but by emphasizing the need for decolonizing practices and pedagogical approaches that catalyze epistemic diversity.

This diversity of views is central to PFU's mission and Doctor Lal Sharma, initiated this project in response to his concerns about the lack of spaces for such critical and creative conversations to be nourished. Lal Sharma like Sunil Sahasrabudhey sees this constricted national intellectual space as reinforced by the propagation of neoliberal conceptions of

globalization through the mass media, mainstream educational institutions, and those in positions of power and privilege in India. He views PFU's projects as a significant effort to create a grass roots led alternative to what Vandana Shiva has referred to as the production of a monoculture of the mind in India (Vandana Shiva, 1997).

Banwari Lal Sharma- Founder of Peoples Free University

I met Doctor Lal Sharma in 2005 at the recommendation of Doctor Vandana Shiva in hopes of learning more about these new education projects he has been spearheading since his retirement. He encouraged me not to meet him at his office but rather to meet at one of their 'educational sites' about an hour north of Varanasi to talk further. When I arrived, I saw a group of 40 or 50 people sitting under a tree, they were mostly mothers and elderly women and there was a small group of men with them. I noticed a stage and realized this was the 'protest' that people had told me about in Varanasi, though it was different than I expected. There were few signs or banners and people mostly sat in small groups quietly speaking with each other. It actually was a dharyan or sit in and within minutes of arriving I was introduced to Doctor Sharma and I was surprised as I was told that he was in his late '70s or early '80s and he looked 20 years younger. He was in a white cotton dhoti and shirt and he smiled and said, "so you made it!" He began to introduce me to most of the people there and I asked them each a few questions. One man offered to translate and I asked one of the grandmothers why she was there.

She explained that when the plant was being planned the local politicians had promised many high paying jobs and a surge of prosperity for the area. "These (benefits) we never saw and instead we have a drought, the wells have dropped 30 feet or more and we have had drought worse and longer then we have ever known in this area." The translator chimed in, "they pump a million gallons a year out of here." In the upcoming hours, I watched a variety of speeches,

which I could not understand but which were translated for me. Banwari, tied a white piece of cloth on the arms of those who were engaged in a hunger strike and later a theater troop performed a piece about the effects of the plants on surrounding villages.

Another woman explained, “these plants pump out chemicals which go into the rivers and pollute them” and “this has been seen all around India.” Eventually Professor Lal Sharma asked me to come on stage and pushed me toward the microphone. “Tell them something” he said, and I’ll translate. I was extremely embarrassed, what could I offer these people in the way of inspiration when they had already sacrificed so much? Finally, after what felt like a never-ending silence I said:

I honor your courage, and I have been told how hard it is for you to leave your villages and come here for this. I am struck by how easy my life is in comparison. I want you to know that I will tell other people your story.

Before leaving, I made an appointment to go to Lal Sharma’s home. I traveled several hours to Ahmadabad and I stayed a few doors down from his house, which was convenient as I met with him a number of times over the course of several days. He explained that he was personally affected by Gandhi and by those who carried on his work and that he had dedicated his life to forwarding that work as an educator. Over four decades, Lal Sharma worked as an activist addressing issues of ‘communal discord’ (interfaith community building), challenging poverty and promoting gender equity. Eventually, he explained what he saw as the most important battle, “these days there is a trade war going on; it’s a war, I tell you. When they emerged from the GATT negotiations, the EU and USA...they declared we have won. That was the meeting in Morocco, why do you think they did that? What have they won? It’s a war I tell you, with displaced people and everything. You know war displaces people. Well why do you think people jump over the fence in your country from Mexico?” I asked how he became so interested in global economics and he replied, “we realized that the problems we want to tackle

cannot be tackled in an atmosphere of globalization.... It has intensified the existing problems.... So it has changed our priorities.”

As Lal Sharma spoke, my mind drifted back to the people I had met at the Dhyana, sitting under that tree outside the Coke plant just a few days earlier. I understood why he had changed his priorities in term of the content of peace education in that context, reflecting to myself-if the water runs out then not much else matters. Doctor Sharma wanted to make that point from our first encounter that neoliberal globalization and ideas of the free market issues translated into life and death situations for people’s lives on the ground in his country. The stakes then were high and this was far from a purely academic affair for Lal Sharma, who had dedicated his life to peace education and felt a clear need to address these issues as both a social justice activist and an educator.

Doctor Lal Sharma argued that the way concepts like ‘development’ are constructed and engaged with matter as they animate the policies of the Indian government and international institutions like the IMF and World Bank and affected everyone’s lives in India. From his point of view and those of his colleague, education has a key role to play then in shifting the issues in India as such conception represented only a tiny fraction of the diversity of viewpoints present on the ground.

Content—Demarcating the Terrain of Resistance

This section provides a brief overview of the formal thematic terrain of PFU’s curriculum laying the groundwork for a deeper investigation of their attempts to facilitate epistemic and ontological complexity in response to the demands of global complexity. The PFU’s curriculum provides a foundation for their popular education (Friere, 1970) efforts ‘as their readers’¹¹⁴ are a

¹¹⁴ ‘Readers’ is the term used by PFU to refer to their core curriculum booklets they distribute to the local groups.

departure point from which participants engage in conversation around critical curricular themes and adapt and apply those themes in relation to the dynamism of the context in which they are located. PFU's model provides a compelling case for analysis when thinking about education on the edge of chaos as they draw on fixed and mandated curricular materials in their work yet offer little in the way of formal structure or even guiding best practices in terms of guiding pedagogical processes or evaluating their learning outcomes.

PFU's educational model rather is predicated on invigorated local leadership and the development of self-organizing processes over time. They rely heavily on the creativity of the social activist networks they collaborate with and the critical and creative orientation staked out in their curricular materials. PFU's curriculum then plays a vital role in sparking interest and guiding participants thinking in terms of the field of possibilities in terms of anti-colonial education and catalyzing greater diversity of viewpoints in relation to these social and ecological justice themes.

At the time that interviews were conducted with Doctor Lal Sharma and other members of the organization PFU had developed enough curriculum materials to cover a single year's worth of study. They had published six readers and a single reader offered a range of topics that could be explored over several months. Each of the readers was written by a different author or collection of authors and they were broadly inter-disciplinary in their approach. The first reader begins with an analysis of 'development' and a critique of 'growth' the results of which are summarized as an "unmitigated social and environmental disaster" (Vidyapeeth Reader, 2006, p. 5) in their literature. It discusses the limits to 'growth' (First Year Graduate Reader, 2006) and the effects of growth on the poor by providing a challenge to the assertion that rises in GNP lead to a better life for large numbers of people. They cite both discontents in 'successful' examples

of growth as well as the brutal effects for the majority of the world's population who are left out of such development. The second paper explores the roots of colonialism, unpacking a wide range of oppressive historical moments focusing on military backed resource exploitation and the creation of perpetually impoverished societies throughout the global south. They also contend that such exploitation consistently has been accompanied by a devaluing of "the intellectual and other contributions of Asia and Africa" (Vidyapeeth Reader, p. 7). This second paper also highlights "heroic resistance" that has occurred in the face of such violence throughout the past three centuries. It is in the second reader that the authors begin to connect the "root causes of colonialism" with the current conditions of globalization drawing linkages with the 5,000 or more multinationals companies that are "gradually taking charge of the Indian Economy (and)...continuing the impoverishment of societies" (Vidyapeeth Reader, p. 6).

The third paper goes on to explore the idea of 'free trade' and examines thinkers within classical economics, drawing mostly from primary sources in developing an argument about the misappropriation of by neoliberal thinkers. The main argument made within this paper is that "what is happening in the name of free trade does not conform to the principles of classical economists" and yet it is put forward as a preeminent example of such principles, a slight of hand goes largely unquestioned. The fourth paper begins to turn the corner from what is a predominately deconstructive and critical effort, looking instead at Indian and Chinese contributions to scientific and technological innovation dating as far back as 5000 BC. It looks at the influence of western scientific thought and 'rationalism' noting the far-reaching effects of these modes of thinking on India thought (for better and for worse) and highlighting contributions made by India scientists. The exclusion of their work from more mainstream historical accounts underscores the epistemic arguments made throughout the curriculum, which

contend that western perspectives have marginalized other voices.

Paper five traces the “rise of multinational corporations” (MNCs) and deepens their analysis of the detrimental role that the consolidation of economic power has had in India and around the world. Beginning by looking at the “forerunners of MNCs,” the paper explains the exploitative activities of The English East India Company, The United Dutch East India Company and The French East India Company were very similar to the actions of MNCs today (Bowen, 2008; Shaker, 1970). It spotlights the rise in power of these companies and their transformation from interest in trading to the acquisition of land and political power in India. It then includes an examination of the rise of corporations in America challenging the legitimacy of these organizations by citing a long history of skepticism and resistance in the US to corporate power (Gieder, 1993; Judis, 2000; Palast, 2004). They particularly highlight a host of popular concerns that arose in US after the civil war about the potential effects of corporations in eroding democratic societies. In the Vidyapeeth reader they contend:

This widespread resistance to the idea of corporations was triggered in large part by efforts to extend the legal rights of individuals to corporations there. According to the reader, Abraham Lincoln summarized the zeitgeist of the times when he penned, Corporations have been enthroned...An era of corruption in high places will follow and the money and power will endeavor to prolong its reign by working on the prejudices of people, until wealth is aggregated in a few hands...and the republic is destroyed. (Vidyapeeth, 2006, p. 9)

The remainder of this paper goes on to chronicle how Lincoln’s worst fears may have come true as corporations have pursued their own profit maximization at the cost of both democracy and “the larger collective aspirations of the society” (Vidyapeeth, 2006, p. 16).

The final paper in The PFU’s series examines global environmental and human health concerns. It looks at “water injustices” and the confluence of factors that make countries in the global south more vulnerable to calamity. Here the complexity of interrelated systems is highlighted in relation to global climate change. They note that because of climate change, there

is storm intensification and as such, intensification occurs, coasts are more vulnerable to Tsunamis, hurricanes and floods of various kinds. They contend that at the same time with the demands of global markets coastal mangroves are being replaced by shrimping production and the mangroves that formerly mediated the effects of these storms are now gone. Additionally, more people are experiencing living in poverty and they are being forced to move onto lands that are in these flood plain. The authors conclude storms now affect more people and the effects are more devastating especially for those who do not have economic security as the natural barriers have been removed and the storms are stronger than ever before and people face these calamities with fewer resources (Dasgupta, Susmita, Laplante, Benoit, Murray, Siobhan, Wheeler & David, 2009; UN Chronicle, 2009; World Bank Policy Research Working Paper, 2000).

The last paper thereby raises a whole host of issues related to the violence people are facing because of the global capitalist economy and the increasing complexity of compounding effects resulting from exploitative actions within these systems. All of this is intensified they argue by disproportionately high levels of consumption in the west and the unfair influence on a host of global institutions (IMF World Bank, The UN) that are held up as counter balances to such forces through the efforts of elites at home and abroad.

The authors of PFU's curriculum argued that it differs from most formal university programs in India in that they offer a critical and broadly interdisciplinary approach (authors come from a range of backgrounds-physics, mathematics, economics, social sciences, humanities) to highlighting global complexity and the negative impact of global capitalism and neoliberal policies. Their curriculum attempts to offer ontological insights into some of the dynamic, fluid and interrelated patterns that play out on a global scale by exposing learners to a range of interrelated issues in India, moving across scale (continually demonstrating the inter-

relations of the macro and micro and vice versa). All of this is done in hopes of supporting dynamic conversations in PFU's groups to deepen critical understandings of neoliberal perspectives and to make some of the dynamics of global complexity more accessible to people.

PFU's content is written by a collective of authors who ground their work from an ontological standpoint that is in keeping with complexity's insights as they seek to illuminate the reverberations of political choices in multiple open and interconnected systems. However, PFU's curriculum seeks not only to teach about complexity but also to serve as a starting place for engaging the embedded ethics, epistemology, and knowledge generating practices of local people. As the next section explores, this interaction between context, content, and pedagogy for educating on the edge relies heavily on self-organizing processes generated by the groups in response to these materials. As discussed earlier in chapter in relation to the LVM this approach is wrought with challenges, tensions and possibilities. While encounter and iteration can create emergent forms of counter-hegemonic knowledge they can equally reify oppressive dynamics or lead to the collapse of these fledgling learning collectives through the coercion of charismatic leadership, lack of adequate pedagogical structure or spaces and a host of other problems.

The core members of the PFU much like the LVM have identified the need of continually re-imagine the priorities and thematic terrain of the university by creating participatory pathways for situated responses to curriculum and pedagogical development. They also seek to initiate those conversations within highly complex networks of affinity and interest. PFU's curriculum is intended to serve as a catalyst for drawing on local creativity in addressing the possibilities for education as a space for (re)-imagining alternative globalization. Their approach then largely depends on co-evolving processes of curricular and pedagogical development. The next section examines how PFU attempts to support the development of self-organizing

pedagogical processes that increase feedback in response to contextual complexity. It then analyzes the ways in which PFU seek to promote the flow of learning between local and regional groups and the national organizers who generate materials that assist in facilitating education that is responsive to global complexity.

Sawaraj Vidyapeeth- A Complex Approach to Content and Pedagogy for Social Change?

PFU's approach to creating an informal educational system in India that allows for critical and creative engagement with the theme of globalization is based in large part on the input of participants in driving curricular and pedagogical development over time. Implicit in their efforts is a theory of change that holds that local self-organizing groups can be networked into larger networks of affinity and interest and catalyze educational innovation across the system. The critical first step in this process is the development of local groups that are committed and self-organizing in their experiments with pedagogical forms that can effectively catalyze the collective learning potential of their group. Once local groups have had an opportunity to engage in these processes of growth and transformation enabled by creative communication and the development of pedagogical processes, PFU then looks to facilitate learning between the various local groups in India.

The PFU's model provides an opportunity to examine the complex processes that influence curricular and pedagogical development over time and they offer contingent but valuable insights into generating educational systems that are adaptive and emergent in response to pressing social and ecological issues. PFU's approach raises a number of interesting questions in terms of educating on the edge of chaos that will be examined in this section. First, how does pedagogical innovation take place? What are the requisite conditions and sources of energy for that innovation and how do PFU's organizers seek to support those conditions? What is the

relationship between pedagogical and curricular change? If local groups are expected to generate novel forms of pedagogy and thematic content in response to the materials provided, how is that learning integrated into PFU's larger national movement? What are the pathways for communication and self-reflection within and between groups? How does PFU respond to the tension between the need for opening up to new possibilities and for generating durable cycles of pedagogical and curricular support of participant's learning?

The PFU offers a curriculum on global complexity that is used by all the participating local groups. In that curriculum, globalization is framed as a continuation of imperial forces and these activists argue that the field of education in India continues to be impacted by similar exploitative relationships globally. In response, a critical pedagogical commitment runs throughout the PFU curriculum and they emphasize the detrimental effect of efforts to systematically undermine, ignore, or remove viewpoints from the global south within the educational literature. In this way, they make a case for engaging in what could be understood as a knowledge war opting for curricular and pedagogical approaches, which they hope, will allow for greater epistemic and ontological diversity.

This knowledge war as it applies to education is not simply a matter of exerting influence over what materials are presented within mainstream education but also seeks to highlight the effects of colonial thinking on the ways that people teach (pedagogy) and who has access to that education (Friere, 1970). PFU is working to offer a response not only to the shortcomings of mainstream content but to enroll the community groups in addressing the shortcomings of those reductionist pedagogies. They seek to challenge the imposition of educational goals that marginalize the importance and unique opportunities embedded within the contexts in which education takes place, as they believe that these approaches tend to reproduce the status quo.

In terms of the specific pedagogical technologies used in facilitating such participation, the organizers of the PFU have reached out to their contacts in education, social movements, and civil society, offering their curriculum materials as a starting place for small group discussions nationally. Banwari Lal Sharma suggested in our interviews that these sessions are intended to be largely dialogical and critical and guided by the expertise and interests of each local group. While his emphasis is clearly on encouraging context specific learning opportunities in relation to the themes of the curriculum they are distributing, PFU offers little in the way of pedagogical structure to shape such processes. PFU has neither a written guide for how to engage with the curriculum nor specific facilitators (like the Vidya Ashram) that they send to the sites to initiate conversations or model pedagogical processes. However, they do offer a far more well developed and structured set of content materials from which to initiate these group conversations and as will be explored more later they do in part draw participation from networks of people that are already familiar with participatory and critical pedagogy.

Here the edge of chaos offers a helpful analytical and metaphorical resource for examining PFU's attempts at educating on the edge by highlighting the need for a requisite level of structure for emergent adaptation to occur over time. As discussed in chapters two, three, and four, what constitutes ample/appropriate structure in the field of education is a highly contentious issue amongst both complexity and peace education researchers. Complexity theory suggests that the degree and type of structure needed is both variable depending on the history of the learning systems, the conditions and the individuals involved and therefore is often difficult to assess far in advance of the formation of these learning collectives. As complexity researcher Stacy Reeder noted, participatory education, and especially dialogical and conversational forms are often "characterized by the ebb and flow of dynamical interactions." Complexity theory suggests that

those dynamic interactions are influenced not only by the curriculum or facilitated leadership but also by the situated experiences of the participants and the complex conditions that emerge in these groups.

This is significant in the case of PFU as they are intentionally drawing participation from activist networks that frequently use democratic and participatory processes of organizing and learning. Thus, while PFU may not offer clear pedagogical mandates or suggestion beyond insistence of dialogical and participatory processes, Lal Sharma's trust in local participation may be grounded in his familiarity with the types of experiences that many of the participants are coming in with as result of their participation within activist networks. That participation is influenced clearly by their nested location within other networks and their engagement with alternative sites of resistance and education. However, employing a minimalist structure to educating on the edge does not necessarily indicate a propensity towards emergent pedagogy as it may equally lead merely to chaos and disintegration of the groups over time (Doll et al., 2005).

In the one of PFU's groups that I observed at the Navdanya Farm¹¹⁵ (founded by Vandana Shiva) the staff and volunteers at were regularly engaged in educational projects and participatory action research. As a result, they regularly used an eclectic array of pedagogical and research approaches in their ongoing work. Those approaches included democratic decision-making, dialogical learning, experiential learning models, and community field research, where participants engage in community work and then return to reflect on those experiences based on the theoretical models and topics they were discussing at the farm. When PFU sessions were held at Navdanya, members of the farm community and their community partners brought those experiential and participatory pedagogical approaches into their engagement with the readers. As

¹¹⁵ I conducted research, including ethnographic field research at Navdanya over a two-week period in 2005.

a result, sessions were aimed at creating space for all members to participate and moved away from a single facilitator and expert approach and toward conversational approaches and democratic process when considering possible action in response to the learning.

Navdanya highlights the potential variability that can occur when implementing a project like the People's Free University as PFU's groups are influenced both by the pedagogical field of possibilities at the local level and the curriculum, which examines the relationships between power and knowledge-production with an explicit intention to move away from mechanistic and colonial approaches to education. While it may not be possible or even desirable to disentangle the influence of the local context and the curriculum, organizers note that both play a key role in how groups develop. In terms of the curriculum, the critical discourse not only pertains to issues "out there" in the world but also offers models for encouraging self-reflexive accounts of teaching and learning. The precedent for such discussions is established in the literature, which consistently highlights the need to approach knowledge production from a radically different perspective than the didactic and rote learning approaches popular within Indian schools. That approach privileges participation by all members of the learning collective and new ways of examining and speaking about education in seeking self-organizing approaches to engaging with the curriculum. Complexity and education researcher, Jayne Fleener pointed out.

Learning, as a transformative, dynamic, complex process, defines the spaces of our being as "negative absence," created and sustained through the meaning structures of our language games. As our language games change, we may come to see schooling as something very different. (Fleener, 2005, p. 70)

The role of curriculum in PFU's approach is significant then from a complexity point of view as the field of possibilities can be shifted in important ways because of their critique of modern education and the alternative language offered in their efforts to point toward the need for greater pedagogical diversity. Since PFU's groups are self-convened with the intention to

provide spaces not merely to discuss this history and the alternative educational possibilities but to envision and experiment with other forms of education this discursive domain acts as a attractor actively pulling the system toward alternative pedagogical practices.

While innovation, challenges and breakthrough are occurring in the small group context for PFU they are also faced with the task of finding ways to analyze these processes, as they are developing to gain deeper insight into the workings of the emergent approach they are trying to establish more widely. Indeed, such self-reflexive demands have the potential quickly to overwhelm any single individual interested in engaging in such pursuits while conducting the day-to-day work of education. As a result, PFU encourages a collective approach to this analysis and the dissemination of findings by working to establish pathways for these local and regional groups to learn with and from each other. In the case of PFU, the complexity of this task is amplified as they are piloting their curriculum in multiple diverse locations simultaneously. While this organizational complexity poses challenges, the evaluation of these pedagogical processes, the shared language around assessing success and the results of these findings over multiple iterations also offers rich sites for future pedagogical development and for deepening their ontological engagement with complexity. In keeping with PFU's commitment to Swaraj Vidyapeth, (self-rule in the field of education), they are responding to the demands of engaging with complexity by inviting members of the dialogue groups to engage in these processes of analysis. PFU is working to create such moments for self-reflection and to increase feedback within and between groups at both the regional and national level.

Toward this end, they have planned a series of regional conferences culminating in a national conference that will provide opportunities for self-reflection on the pedagogical developments of the groups, the ways in which the curriculum is being adapted and the ways in

which the program is supporting people in responding to complex global issues. PFU hopes this will provide a valuable opportunity for collective analysis about the effectiveness of their curriculum and provide an opportunity to assess the expectations of what the organizers think should be happening in light of what is actually happening within various groups on the ground.

In these early phases of development, it is still unclear if these spaces will provide a valuable opportunity for the PFU collectives to gain greater self-awareness of their pedagogical processes through engagement with other groups and if they will be able to further develop processes and pathways for inspiration and critical learning to flow between these various autonomous learning collectives. Such approaches are difficult to organize in practice and many questions remain for PFU in terms of the social technologies and circumstances under which such far-reaching goals may be achieved.

What comes into view at this phase of PFU's development is a messy picture, with several creative axes where innovation (or disintegration) may occur. As they were awaiting their first national gathering at the time they were interviewed, the results of this experiment with embracing complexity in social justice education in India are just underway. However, their approach illuminates important points of reflection that shed some light on some of the problematics and opportunities when developing educational methodologies aimed at supporting people so that they are more likely to learn within dynamic and varied contexts and meet the problems they may face with a greater sense of energy and resourcefulness.

PFU offers a model whereby engagement with complexity is supported through a critical approach to globalization and interdisciplinary approaches to examining global complexity. For the PFU both engaging in critical discussion about globalization and asking questions about what de-colonizing practice might look like is an essential part of their larger goals of generating an

emergent liberatory pedagogy and larger movement-building. PFU's approach is meant to embrace change, viewing adaptation as a vital source of energy that allows the groups to respond to complex circumstances and they are attempting to do so by bringing these semi-autonomous groups together to engage with questions of both individual (group) and larger collective praxis.

They draw on social movement networks as sources of energy for re-imagining education and pedagogical diversity and invigorating the curriculum. They try then to create moments of convergence for these various groups to learn from each other. As such, PFU's central organizers have little control over what happens at the local level and difficulty speculating about what may emerge from these larger gatherings. This possibility for emergent self-governance and self-awareness within and between multiple nested learning communities which PFU's approach is based on is examined in the complexity and education literature. Here Complexity author Stanley noted, "self-governance of the system itself" is largely influenced by that "systems own internal dynamics or self-organization" (Doll et al., 2005, p. 218). Those dynamics of self-organization are in the process of formation in PFU's small groups as they are actively experimenting with various pedagogical forms and ways of engaging with the curriculum in the local groups. While groups like Navdanya are actively seeking participatory democratic approaches, PFU has yet to convene their national gathering and to get a full sense of the range of pedagogical practices that are developing and to reflect on how those internal dynamics will influence the collective field of possibilities. Given this ambiguity on the edge, their emphasis on self-reflexivity lines up with Stanley's account insofar as understanding the internal dynamics of these systems and the complexity that emerges from the convergence of various groups will play a critical role in influencing what is possible in the future.

PFU's macro approach to educating on the edge of chaos relies heavily on cultivating

self-awareness and self-organization across various scales in relation to their larger network-that is that people recognize they are individually and collectively contributing to the formation of the pedagogical processes and curriculum that animate the university. However, what does it mean to become self-aware across scales? Toward this end, PFU is asking participants to consider: How their groups are seeking to maximize learning with minimal pedagogical constraints? How curriculum influences what they see as pedagogically possible and vice versa in the small groups? How can the groups effectively communicate, collaborate, and learn from each other? How the ideals of self-governance and self-organization play out at the local, regional and national level?

PFU's approach is ambitious as they seek to create opportunities to engage participants in responding to these questions prompting deeper reflection about the ways in which self-organizing processes are taking place and examining the degree to which those efforts are creating alternatives to the 'mind-enslaving' education (Vidyapeeth, 2006, back cover). Complexity theory holds that emergence occurs from local actors responding to local conditions with opportunities for higher order rules to emerge from those processes. PFU's model attempts to create space for such emergence to occur by locating themselves on the edge engaging in a constant negotiation between these newly forming pedagogical processes and education structures and the need to be responsive to complexity. Toward that end, they encourage people to experiment with embodying a living pedagogy and curriculum where the goals and the processes are responsive to what learners think is most relevant in relation to the themes being explored locally. In terms of educating on the edge of Chaos, while such education does not need to eliminate ambiguity it also should not deny the role of structure all together either. PFU tries to walk this line, with a set curriculum that makes room for the existence and interplay of both

chaos and structure, offering set curricular materials as a 'jumping off point' for local, regional and national conversations and spaces for self-reflection around emergent praxis in response to that curriculum.

While PFU's commitment is consistent with the complexity and education literature on the centrality of feedback for creating self-organizing pedagogy over time, the results of these attempts are far from clear. PFU much like social movement actors around the world are seeking to create spaces of "encounter, discussion, experimentation and affinity" (Osterweil, 2007, p. 258) and continually to enroll more people in the discussion on how they (collectively) are/can go about their work. This is not simply about innovative pedagogy however, as PFU is fully committed to exploring emerging ideas of how an educational resistance movement can function and how they can create larger conversations within Indian society that disrupt neoliberal globalization. As more people 'enroll' in PFU these pedagogical seeds that are being sown in a larger social context where people are looking for (and already are developing) ways to self-organize around these themes.

Regarding PFU's goal of influencing larger social change, a complexity analytic may provide conceptual tools for (re) thinking about how such shifts may be realized in practice. Given that from within a complexity theory perspective systems are often open, inter-related and overlapping, greater attention can be paid to the dynamics of feedback processes and the pathways for communication that are now beginning to emerge within and between the regional and national groups. Time will offer opportunities for iteration and should allow participants a more developed set of pedagogical process through which to engage in discussion about how they are maintaining contact with each other, what they are learning, what is drawing them together and how all of this is changing over time. As PFU continues their work, more

opportunities may arise for them to examine the effects of encounter, deliberation, reflection and coordination. However, such large-scale gatherings also run the risk of fracturing, causing confusion and a lack of focus without sufficient pedagogical structure and affinity to spark interest outside of the local context.

A complexity informed stance for PFU would encourage them to look for ‘border crossers,’ (Borsa, 1990, p. 36) ‘web-weavers’ (Lederach, 2005, p. 92) and ‘early adopters’ (Gladwell, 2002, p. 301) in terms of the creation and expansion of critical and creative subjectivities in relation to the theme of global complexity and for a sense of affinity with the other groups involved. These places where encounters create shifts in patterned ways of thinking and the migration of such changes across time and space while difficult to trace from a complexity theory point of view, are central to PFU’s ongoing discussion about how social change takes place and how they can maximize such changes in India. Here social theorist Graeme Chester’s pointed out the challenges of researching and understanding such processes which require analysis of “material and immaterial flows, including people, mobilities, technologies and knowledge practices as they unfold synchronically in intensive encounters and diachronically through the diffusion of weak links that reconfigure virtual networks” (Chesters, 2006, p. 126).

Banwari Lal Sharma’s approach suggests that he recognizes that pedagogical experiences and the effects of learning are not restricted to the moments when students gather to discuss these issues, as they are already influencing and being influenced by many other interactions and systems. An open systems perspective on change also suggests that the effects of the changes taking place within and between these PFU groups will be felt outside of those spaces in subtle and complex ways and provide a vital area of inquiry within their self-reflective processes.

PFU's commitment to self-reflexive processing can also expand to include an examination of the ways in which those changes have 'leaked out' of local groups, where boundaries are not as solid or stable as they may have assumed and thus have been crossed. This mapping of the many ways in which learning is effecting change seems at the heart of their current endeavors at the national level.

As PFU is concerned with larger social change, complexity theory suggests that the tracing of these non-linear outcomes may be difficult and yet it still offers valuable insights when considering when tipping points within the local, regional, and national context may be imminent or have just occurred. By making their view of the dynamics of social change more complex, they may be able to research further their contention that these groups small as they may be, exist within systems that are far from equilibrium and as result can spawn dynamic and innovative ideas of social change in ways they are not yet able to see. Doctor Lal Sharma is a life-long mathematician and he is betting on it!

Toward Conclusions

Ideas of the 'global' are pervasive across virtually all peace education content areas (Bajaj et al., 2008). However, the descriptive explanatory frameworks that are able to account for the dynamism and complexity of the global and how it can be engaged with through educational praxis are under-researched. The conspicuous absence of this meta-lens is of significance to those researching education in the global context and to anyone interested in examining the role of education for addressing "global problems." Though conceptual guideposts may often be lacking, greater complexity at both the local and global levels is being felt and responded to by peace educators in various parts of the world. The projects featured in this chapter and the previous one, point toward a diversity of perspectives and approaches that exist on the ground

and highlight the epistemological and ontological struggles that occur for educators developing praxis that engages with global complexity. What emerges is not a unified view of the global but rather varied responses which at times echo the insights of complexity theory and point toward a shift in understanding—a move toward the edge or perhaps more accurately stated, toward the edges of chaos in relation to teaching and learning.

This chapter examined specifically the various ways that educators in India responded to the challenges and opportunities they faced when engaging with complexity. For these educators, their location within a rapidly globalizing country with a living memory of its imperial past and connection to thousands of years of history highlighted the need to address head-on the pressures of ‘development’ and the epistemic frameworks which underpin what they saw as the exploitative relationships embedded in post-colonial paradigms. The situated experience of these educators further fueled their desire to challenge the production, distribution, and structure of education in India especially regarding engaging with the theme of globalization. The People’s Free University and Vidya Ashram both offered opportunities to examine these efforts in relation to the actual pedagogies and curriculums they generated and the discursive and epistemological frameworks they employed. Further, they provided examples of educational responses to complexity that further contextualized the work of educators in both Japan and the US vis-à-vis global flows of power and pointed toward a better-developed field of possibilities when educating for peace.

In terms of these educator’s responses to complexity, the last two chapters highlighted three major trends in peace education. These included: 1) an ontological shift that was at times resonant with complexity theory;¹¹⁶ 2) A search for greater dynamism and the cross-pollination

¹¹⁶ These educators sought to understand the world in dynamic and interconnected terms and to move away from the

of ideas via global connectivity; and 3) The expansion of the pedagogical and curricular parameters of education resulting in adaptive and emergent forms of pedagogical and curricular design.

Educators in India, Japan, and the US often sought to cultivate a wider range of emergent learning opportunities by utilizing varied pedagogical spaces and an increasingly complex array of social technologies. For example, both LVM and PFU created community-based educational models where participants choose the location of their sessions and each promoted a pedagogical orientation that they thought could support self-organization over time. They challenged the regime of consistency in education in favor of approaches that they hoped could offer more diverse educational forms that could be used in response to the particular conditions of any given moment and the interests of learners. For instance, PFU openly invited community members to experiment with pedagogical forms and to report back the approaches they were using. While this emphasis on participatory and situated responses opened the door for creativity in these fledgling programs it also raised serious and persistent questions about how pedagogical decisions were made, who was involved in such decisions and the complex forces that influenced pedagogical development over time. Further, the emergent nature of the process meant that even given these educators' efforts to understand the conditions through which emergent pedagogy and content develops they struggled to 'isolate' specific choices or occurrences that could be credited with specific changes. Rather than keeping with a complexity analytic, they tended toward a descriptive explanatory language that assumed that these small groups would develop their own patterns of interaction and that local interactions would lead to larger patterns of innovation and even connection with other groups. This approach assumed that the small groups involved in

regime of management, control, and repetition in schooling.

both the PFU and LVM could develop an increasing sense of coherence over time and that the themes of critically evaluating globalization and supporting local knowledge may generate the requisite affinity to keep groups in dynamic interaction with each other over time.

In this way, educators in India managed an ontological tension in their work of educating on the edge of chaos. On the one hand, they acknowledged that planning in relation to curriculum development and pedagogical structure could influence outcomes and was important. On the other hand, they understood that these processes needed to build themselves and as such sought to promote self-organization by offering suggestions and materials for inspiration while also seeking minimal constraints on such behavior. They navigated the edge of chaos much like a tight ropewalker, continually negotiating the balance between control, structure, and possibility. While educators often fell short in meeting their own aspirations in this regard, they consistently responded to such demands with a commitment to diversify their pedagogical practices and social technologies for self-reflexivity, as self-reflexivity was critical to engaging with the challenges of engaging within varied and dynamic systems.

For example, the LVM adjusted their curriculum through a collective process of reflection at the Ashram after conversation ‘fell flat’ as facilitators and participants were unable to articulate the relationships between local political struggles and larger conversations about LokaVidya. This led not only to a shift in thematic content over multiple interactions but to a shift in process, as local community members replaced members of the ashram in leading discussions. That discussion then took on a life of their own, as community members grew more comfortable in shaping conversation. No two conversations ever looked the same just as no two clouds, or rivers or communities do. Thus, these educators distanced themselves from approaches that are more traditional in seeking to engage with context as vital source of energy

for emergent learning as opposed to dismissing such dynamism as disruptive. In rebuking mechanistic approaches to education practitioners in India did not abandoned the desire for educational outcomes altogether but rather reframed this tension between spontaneity and control as a vital source of generative energy and an essential albeit chaotic reality of educational praxis. These findings shed light on the viability of education on the edge of chaos adding to this dissertations dual contention that complexity theory offers a helpful metaphorical and analytical frame for supporting responsiveness to complexity and that peace education offers a vibrant body of work for examining applied examples of such responsiveness.

The Edge of Chaos is a significant sensitizing concept when reading education from a complexity frame as it reinforces complexity's contention that context matters as educational collectives need to continually interact with and learn from the many systems in which they are nested if they are to remain truly alive and relevant. This insight was taken onboard strongly by the educators featured in this chapter. For example, The LVM not only sought to be responsive to local needs but also to engaged with global complexity by seeking engagement with global allies in the alternative globalization movements through global connectivity. They differed substantially from the cases featured in the previous chapter insofar as they sought to embrace a critical orientation that conceived of such global dynamics as generative places of both resistance and cooperation. Where peace educators in Japan and the US also privileged engagement with context they tended to frame global connectivity uncritically as a boon where educators in India critically highlighted the knowledge agenda being forwarded in their country by global elites and the systematic devaluating of local and indigenous knowledge within such domains. They then sought to participate in global spaces where this criticality could be expressed fully and where opportunities for collaboration and solidarity might arise in relation to this need to move from

the global to the local and back again. The LokaVidya Movement participated in the World Social Forum and found that their educational goals were resonant with what Graeme Chester's describes with that educative environment in which "freely cooperating autonomous actors engage in the day-to-day management of their own lives through a vital, open and uncoercive public sphere."

Both the Vidya Ashram and PFU shifted the locus of knowledge production out of the universities and into varied community contexts both locally and globally. The PFU sought to do so by enabling autonomous and self-organizing educational spaces in communities across the country so that they could be more dynamic in their responses to critical themes related to globalization. Educators from PFU and the Vidya Ashram argued that such critical analysis of power could be a wellspring for educational renewal. They contended that as MNCs and states put forward narrow interpretations of global possibilities these narratives effectively minimized the importance of the real problems many people faced regarding the environment, water management, and food production, viable forms of livelihood and host of other issues that affected the everyday lives of people in India and around the world. These educators thus were concerned with the narrowing of epistemic complexity and hegemonic interpretations, which reduced what many people, saw as possible in terms of their own sense of agency in relation to global complexity.

This critical orientation toward the global prompted Indian educators to seek radical new models for education that acknowledged the importance of place in education and both developed curriculum and pedagogy in various decentralized location across the country. They developed an emergent curriculum that was sensitive to oppressive power relations and privileged local indigenous interpretations over those from above or abroad. This does not imply

that these educators saw such critical perspectives as absent in the north; in fact, they recognized and engaged with a growing body of thought globally that posited a similar challenge to neoliberal agendas. PFU focused primarily on their local efforts but saw such efforts as connected to these larger global movements and as this chapter examined they remained critical of global connectivity even while seeking to take advantage of the opportunities it afforded. They therefore offered a host of critical and creative methodologies for catalyzing learning within multiple open and interconnected knowledge systems.

In all, these two data chapters used complexity theory as an analytical device to explore the diverse social technologies and ontological orientation that educators in Japan, the US and India used in reconceiving their pedagogical and curricular approaches in response to global complexity. These peace educators were responding to a perceived need to make more complex the content of education and to put greater emphasis on thematic relationships across disciplinary boundaries. Many of these same educators also felt a need to adapt their teaching practices and to develop pedagogy that was responsive to the complexity of the world in which they found themselves. Thus in India, Japan, and the US educators continually diversified and adapted their curricular and pedagogical approaches and adopted a stance regarding educational philosophy that embraced constant change. This move toward the edge of chaos neither dismissed the need for educational structures nor sought to maintain that structures need remain fixed over time and each of the projects examined engaged with these demands differently. Educators offered a common refrain insofar as they emphasized the need to grow a living curriculum and pedagogy that was responsive to multiple interconnected systems. This required that they embrace the tensions inherent in designing educational plans that could support the complex conditions of emergence, which often influenced those plans in unpredictable ways. In each case, peace

educators developed more sophisticated ways to engage with the profound relationality and dynamism that inevitably influenced their specific local-global positions and to think of learning in increasingly complex ways.

These data chapters thus offer an epistemic window into the ontological orientations of peace educators in India, Japan, and the US-orientations that often were resonant with the insights of complexity theory. Most of the educators did not represent this resonance in terms of an overt commitment to complexity theory but rather as an organic adaptation to the issues they sought to address, the nature of the spaces in which they operated and the strongly active qualities of active peacemaking they hoped to support. Complexity theory thus served in this dissertation as a methodological tool for understanding these educators in dynamic terms, moving at least partially away from the mechanistic aspiration for controlling the messy conditions educators encounter in the field. The applicability of concepts drawn from complexity theory were experimented with here in hopes of further developing some of the analytical resources that international researchers and practitioners in the field can use in their efforts to embrace rather than reduce adaptive praxis in response to the demands of global complexity.

Chapter 8: Conclusion

The Challenge: “to sustain a paradoxical curiosity that embraces complexity...; the fundamental belief in and pursuit of the creative act; and the acceptance of the inherent risk of stepping into the mystery of the unknown that lies beyond the far too familiar landscape of violence.”
(Lederach, 2005, p. 5)

What will it take for education to support and prepare learners to reach their full creative, critical and compassionate potential in an increasingly complex and interconnected world? What is the purpose of education in an age of problems and opportunities that are global in scope?

This dissertation advances several main arguments: It contends that the mass educational methodologies developed in Europe around the time of the industrial revolution sought ‘efficiently’ to educate larger numbers of people in the service of the economy and the interests of the state. What emerged was an educational model that was shaped by reductionist and mechanistic ways of seeing the world and was similar to specific modes of economic production such as Fordist practices that flourished during this period. These historical developments are significant when seeking to understand current challenges in the field as contemporary education has in many cases adapted this model of education that combines both, “the neat ordering of knowledge proposed by the thinkers of the European Enlightenment with an approach to transmission grounded in the factory efficiency models of a century ago” (Seltzer-Kelley et al., 2011).

While this educational methodology proved successful in servicing increasing numbers of students in the modern period and is still ubiquitous today (with students sitting in single file lines, educated in batches according to age and tested and evaluated through standardized tests), the language of control, repetition, and predictability that underpinned the rise of the mass education and factory model has also often been antithetical to understanding and responding to complexity. Rather those views aimed at utility and efficiency have often minimized the

importance of engaging with the complexity of context (both local and global), simplified curricular representations of the world, tightly controlled pedagogical processes, and created simple and often rigid measures of success (Doll, 2005; Radford, 2008).

Given these limitations, I therefore argued that contemporary education struggles to meet the demands and challenges of the contemporary period, the hallmark of which is an increasing recognition of the significance of engaging with global complexity (Bauman, 2000; Castells, 1996; Urry, 2005). The central argument of this dissertation then is that innovative methodological approaches and ontological vision are needed to respond to such demands. While deep and far-reaching innovation in the field of education is no small task, this research contends that there are substantive bodies of theoretical and applied work that support these endeavors and offer living examples of praxis.

In this concluding chapter, I will be revisiting the rationale behind this dissertation, and reiterating the research questions, which guide the empirical and theoretical research undertaken for this paper. This will be followed by a summary of major research findings and a final explication of key insights embedded in those findings. Finally, I offer a brief reflection on the application of complexity inspired praxis and consider how others might pursue this work and explore further opportunities for research in this area.

Summary of Rationale

This dissertation singled out the nexus of peace education and complexity theory as a rich domain in which to examine education that is responsive to complexity. It highlighted the significance of the alternative theoretical and conceptual resources resulting from the ‘complexity turn’ (Urry, 2005b) in the natural and social sciences and examined in detail the implications of complexity theory for education that is required to be responsive to global

complexity. It took seriously the highly diverse and global body of work that has emerged in the field of peace education and examined the contingent demands of peace education praxis from a complexity theory lens. This orientation of using complexity theory to help inform an ideal through which peace education pedagogy and education more generally could be examined required that sensitizing concepts from complexity theory be used to analyze the diverse social locales and educational orientations that I encountered in the field of peace education.

This application of complexity theory makes a novel contribution to the field as complexity theory has not been used to examine peace educator responses to global complexity previously. In so doing, I drew on the conceptual resources of complexity theory to examine if and how these educators were moving toward the edge of chaos in their praxis and how educators working in India, Japan, and the US at times expanded the field of possibilities. At the start of this project, there were few examples of the systematic application of complexity theory to the field of education. Consequently, this chapter concludes my attempt to establish the analytical and generative potential that exists at the nexus of these two fields and the contingent demands of actualizing that potential given some of the demands that exist when responding to global complexity on the ground.

Research Questions

- In the field of peace education, what are the ontological frameworks that inform peace educational praxis and which of these are consistent with complexity theory?
- In their engagement with global complexity, are peace education pedagogies congruent with the insights of complexity theory?
- What do these applied methodologies reveal about the challenges and opportunities for developing alternative educational praxis that can be responsive to global complexity?

Summary of Key Findings

In examining the pressing opportunities and challenges that contemporary peace educational praxis faces in light of the demands of global complexity, there are two major findings, featured in this dissertation:

First, in attempting to engage with global complexity, peace educators adapted both their ontological understanding and methodological orientation in ways that were at times congruent with the insights of complexity theory. These adaptations varied based on the situated and contingent demands of their location, prior history, and positionality within global flows of power.¹¹⁷

Second, the tension between peace educators' explicit efforts to engage with global complexity and both the ascendancy of reductionist approaches and the ongoing influence of capitalist and state interests in formal schooling proved to be a touchstone for peace educator's formulation of an alternative praxis.

Explanation of Key Findings

*1. In attempting to engage with global complexity, peace educators adapted both their ontological understanding and methodological orientation in ways that were at times congruent with the insights of complexity theory. These adaptations varied based on the situated and contingent demands of their location, prior history, and positionality within global flows of power.*¹¹⁸

Complexity educators and researchers highlighted the epistemological and ontological

¹¹⁷ The alternative educational approaches and spaces generated by peace educators illuminated the situated and contingent demands, challenges and opportunities of implementing complexity inspired approaches in the response to global complexity.

¹¹⁸ The alternative educational approaches and spaces generated by peace educators illuminated the situated and contingent demands, challenges and opportunities of implementing complexity inspired approaches in the response to global complexity.

limitations of reductionist and mechanistic approaches in the field of education and pointed toward the need to develop approaches that could engage more effectively with complexity. Where mass educational approaches framed fluctuation, variability and responsiveness to context as a distraction from the core function of producing stable, replicable, predictable and easily evaluable educational practices (ch 2), a strong argument has been made by complexity educators (Capra, 2002; Davis & Phelps, 2007; Doll, 2005; Kentel & Karrow, 2007) that greater engagement with the complexity of the world is needed for contemporary education to remain relevant. Further, as laid out in Chapter 2, these complexity researchers convincingly argued that the dynamic and emergent nature of education itself required an ontological orientation that could make sense of such complexity and that complexity theory could play a role in analyzing and informing praxis that was responsive to these demands.

This dissertation contended that peace education provided a promising and diverse body of work from which to explore examples of praxis that were responsive to some of the demands of engaging with global complexity. Peace educators were often cognizant of this need to engage with rather than seek to reduce the demands of global complexity for several reasons.: Firstly, peace educators often view the simplification of complexity in the social world as potentially dangerous as such views can lend themselves to binary and polarizing perspectives that feed into justifications for social exclusion, segregation, discrimination, ecological destruction and violence.¹¹⁹ Secondly, they maintained that supporting learners in responding to local and global challenges and opportunities (Aspeslagh, 1996; Harris, 2002; Reardon, 1998) was central to peace education praxis. Additionally, the field of peace education itself is global with educators conducting work around the world often connected through transnational networks that created

¹¹⁹ Lara Mendel and Mister Matsui both explicitly expressed the need to for engaging complexity in relation to the point made above and Aspeslagh (1998), Reardon (1998) and other peace education others reflect this sentiment.

novel possibilities for collaboration and connectivity on a global scale.

This dissertation then sought to move forward this examination of the possibilities for education that is responsive to GC by analyzing how international practitioners in the field of peace education developed emergent praxis over time. Where a case could have been made (by reviewing the peace education literature) that peace education's explicit focus on global complexity has resulted in pedagogical and curricular changes that were in keeping with a complexity inspired ontology, this work went one step further; it illuminated the ways in which these emergent adaptations were shaped by the contingent challenges and opportunities of the global contexts these peace educators navigated. Significantly, as this finding highlights, peace educators developed a diverse range of methodological resources and ontological perspectives in their efforts to educate on the 'edge of chaos' which were at times in keeping with the insights of complexity theory.

There were a number of commitments by peace educators that were examined in the data chapters (ch 6, 7) that are worth restating here. First, all the educators interviewed expressed that they understood praxis - the mutually informing relationship of theory and practice as a constantly co-evolving and mutually reinforcing process. While this insight about the primary and evolving relationship between theory and practice is nothing new in the field of education, this emphasis on the need for continually adaptive approaches in response to the globally complex, 'messy,'¹²⁰ 'blurry and mushy' conditions of the world (Lara Mendel from Mosaic, 2006) shed light on the imperative felt by peace educators to generate adaptive ontologies in response to global complexity.

Peace educators also ontologically prioritized a profound sense of interconnectivity as

¹²⁰ See John Law: *Against Method: Mess in Social Science Research* (2004)

they located themselves within interconnected complex adaptive systems (Ch 6, 7). This orientation differed greatly from reductionist approaches which often fragmented the world into intelligible bits (Doll 2005), whereas peace educators demonstrated an ontological/conceptual engagement with "systems" that was consistent across the cases examined in the data chapters. However, chapters 6 and 7 also revealed variance in how these educators assigned ontological priority and therefore re-presentational significance differently in terms of the Complex Adaptive Systems which they prioritized as most important as they were responding to global complexity within highly varied contexts and not surprisingly offered situated viewpoints.

For example, Educators at Mosaic and CEL (Ch 6) both pointed out the need to support learners in both conceptualizing and responding to the ontological demands of complexity by examining the complex adaptive dynamics present within social and ecological systems and the interplay between these domains, which they contended were often conceptually separated or oversimplified in their re-presentation in formal schools. The LokaVidya Movement and People's Free University (Chapter 7) on the other hand focused mostly on the complex ways in which international economical, and political forces influenced knowledge hegemony and how those epistemic changes impacted social and ecological systems. While educators in India, Japan and the US all recognized the dynamic nature of complex glocal processes, the processes they focused on and how they located agency differed and this was influenced by their positionality within the global economic and political landscape. Thus these peace educators were not outside of glocal power dynamics but were rather embedded within them and as a result each offered a partial, albeit important, ontological response to complexity.

In all the cases analyzed in this dissertation, peace educators' reconceived of knowledge production in far more distributive terms than is common in mainstream schooling. They re-

framed knowledge production as a complex, systemic and adaptive process that exists far from equilibrium and they expanded their pedagogical approaches for supporting more diverse and dynamic forms of participation over time. Chapters 6 and 7 demonstrated that these tendencies were illustrative of deeper ontological changes as Mister Matsui, CEL, PFU and the LVM increasingly viewed learning as an emergent system effect- born from the complex interaction of curriculum, pedagogy, environment and the multiplicitous interactions of learners within and across various systems over time.

This ontological insight led to attempts to generate approaches that distributed epistemic authority (Kennedy & Kennedy, 2007) and promoted conversational and experiential pedagogical approaches that allowed for the multiplication of pathways for feedback and participation within and between groups (Ch 6, 7). This was not a commitment that translated into reliance on a static pedagogical form for participation but rather an orientation toward change that demanded constant negotiation of perturbation, growth, and atrophy of pedagogical processes within the dynamic learning systems of which they were a part. This sense of responsiveness/openness (moving away from curricular journeys of perfection/control) led to the development and implementation of a wide range of alternative educational approaches and spaces that were utilized by peace educators as they adapted to the demands of complexity. While these changes created a broader field of possibilities for educators they also generated a host of dilemmas as educators sought to maintain some degree of control while opening up to complexity.

Toward Complex and Adaptive Methodologies in Response to Complexity

The above findings have implications when considering how we might move toward more complex and adaptive methodologies in response to global complexity.

As I have argued throughout this thesis, this ongoing responsiveness to complexity is critical if we are to generate praxis that is continually relevant in light of contemporary demands. The efforts of Peace educators in India, Japan, and the US examined in Chapters 6 and 7 offered an important epistemic window into the contingent demands that shape the ways in which peace educators engaged with global complexity. In all three countries, educators diversified their practices over time to include the use of a wide range of alternative approaches in response to the fluid, interconnected and complex environments they were embedded within. These educators however interpreted and applied their ontological insights emerging from their engagement with global complexity differently in light of the embedded demands of their glocal locations. They choose number of specific pedagogical approaches that are worth highlighting here as they offer a palette of potential educational resources for responding to complexity. Those approaches included:

- Diversifying the educational spaces they used. For example, CEL used the lunchroom and garden, Mosaic developed their outdoor camp and both LVM and PFU used a wide range of community locations.
- Incorporating project based and engaged research practices. Matsui and CEL integrated this into their curriculum, as did PFU at their Navdanya location.
- Using arts, theater, and role-play. Mosaic developed pedagogies that relied heavily on the arts
- Critical pedagogical approaches that sought to problematize mainstream narratives. LVM and PFU focused intensely on alternative conceptions of development, democracy, and progress.

This dissertation advanced the claim that these complex methodologies should be

understood as examples of emergent social technologies for continually seeking greater responsiveness to the dynamic demands of global complexity. Teaching on the Edge then was not purely a philosophical endeavor but instead emerged in the process of developing praxis in and for a complex world. What these educators developed was not an unproblematic or final curricular and pedagogical blueprint for all situations but rather a range of methodologies that allowed for greater situational responsiveness over time.

Those methods in all of the cases examined became increasingly diverse and expanded as educators adapted to the continually changing and dynamic possibilities that were present in the contexts in which they worked. Further, educators were challenged to maintain an attitude of openness (continually stepping out of their comfort zones) on edge of chaos as epistemic authority became increasingly distributed over time (ch 6, 7).

This use of diverse practices was by no means a smooth process as there were tensions between the embedded ethics and values of various pedagogical frameworks (ch 3) and unforeseen dynamics that emerged as pedagogical adaptations continually were experimented with in response to rapidly changing environments (ch 6, 7). For example, Chapter 6 highlighted how Mister Matsui explicitly recognized a need, based on what he concluded was an inauthentic engagement with the themes of peace education, to move away from reliance on teacher-centered methods and to broaden the thematic focus of his classes. He opted for students to generate their own questions related to the themes they were studying, lead discussions on those themes and collect, analyze, and summarize data gathered from international tourists visiting the Peace Museum. Matsui reported that he sometimes found it was challenging to open up to opportunities for greater feedback as classes changed in ways that were difficult to predict and he explained that his pedagogy involved an ongoing commitment to experimentation and communication on

the part of both teachers and students as he needed to assess what could be learned from their experiments in the field. While he found this form of education more time consuming and unpredictable he sighted these demands and his struggle as worthwhile as he received consistent feedback that student identities were affected more deeply when they were helping to co-create these pedagogical processes. Additionally, he acknowledged the difficulties with trying to rein in an ever expanding thematic body of work in light of his core normative commitment to remain focused on disarmament education and the impact of the A-bomb in Hiroshima.

In Chapter 7, the Vidya Ashram members experienced a notable change in their epistemic authority over time as well. Educators at the Vidya Ashram struggled to balance a strong normative commitment to critiquing ‘development’ in India and the demand for openness that is part of engaging complexity. This occurred when ashram members were encouraged to shift facilitator responsibility for community conversations to local community members in response to critiques that ashram members were sometimes removed from the realities of the daily struggles of people living in those communities and the topics they wanted to discuss. While the Vidya Ashram developed methods for seeking greater community input in framing conversations and supporting local community members in facilitation, they explicitly noted that they struggled with letting go of epistemic authority and opening up to greater degrees of conversational leadership. In both these cases, Mr Matsui and the team at the Vidya Ashram found that renegotiating pedagogical leadership was risky as it altered the quality and types of communication which took place and made educational processes more difficult to predict and control especially as these educators were often entering uncharted thematic and pedagogical territory.

According to Truit (2005), conversation as a process often allows complexity to manifest

as it is highly fluid and generally behaves more like water than more solid forms in nature. Accordingly conversation shifts, ‘runs’ over and ‘spills’ into thematic domains that can be difficult to anticipate.¹²¹ Conversation or open dialogue is by its nature then unpredictable in practice, and the ontological recognition of the dynamic and constantly changing nature of complexity that peace educators demonstrated, often translated into a practical willingness to take these pedagogical and curricular risks and to move away from traditional approaches.¹²²

Cherine Badawi and Lara Mendel at the Mosaic project pointed out those participatory processes were often necessary to prepare students and facilitators to engage with the difficulties of living in the contemporary world. These pedagogical developments in response to global complexity required ontological adaptability on the part of both educators and learners, as such processes often stood in contrast to the bulk of communication in formal educational environments and mechanistic and modernist assumptions about the nature of knowledge production. Truit highlights this point when she writes, “in school we are disciplined to speak and think in a rational and logical manner, to represent this as knowledge, and to produce these habits of thought. This form of representation unlike conversations assumes a set, certain order.” (Truit, p. 77). The Mosaic Project struggled to bring the conversational leadership and experiential educational models that they had developed at their camp into formal educational spaces. They found that the differing pedagogical approaches and ontological assumptions about knowledge production that were present in formal schooling created a continual creative tension, which shifted their praxis over time.

In responding to the demands of global complexity peace educators in India, Japan and

¹²¹ p77

¹²² Mister Matsui and Mr. Basole at the Vidya Ashram both cited that their shifts in praxis in terms of letting go of some of their pedagogical control, while difficult contributed to a more healthy learning environment.

the US moved away from the language of control popular in many schools and shifted their ontological understanding and methodological orientation over time. This thesis examined the ways in which their understanding was congruous with insights from complex theory, which frames knowledge as neither universal nor certain but rather as a complex emergent process that requires constant adaptation and multiple pathways for feedback in light of continual contextual change. This process of opening up to complexity generated both an expanded field of possibilities and new struggles for educators in the field as they adapted their praxis in light of complex contextual demands. However, it is significant that these changing and unpredictable opportunities and challenges were not viewed a-priori by educators as flaws in their praxis. Rather they were often embraced as peace educators distanced themselves from modernist ontological assumptions about predictability and consistency opting instead for interpretations of the pedagogical journey as a complex, negotiated and continuous balancing act in response to the dynamics of context.

2. The tension between peace educator's explicit efforts to engage with complexity and both the ascendancy of reductionist approaches and the ongoing influence of capitalist and state interests in formal schooling proved to be a touchstone for peace educator formulations of an alternative praxis.

This thesis examined in detail peace educators' diverse positionality in relation to formal schooling and some of the ways in which they made sense of that positionality given their desire to engage with complexity. This tension resulted in efforts on the part of peace educators to either move away from and/or work to transform the constraints of formal educational

environments and methodologies.¹²³ This dissertation found that Peace educators' and learners' interactions in complex environments often produced situated responses that moved them away from mechanistic and reductionist orientations and practices given their ontological commitments to complexity and their insistence on educating for peace and justice. However, while such creative, resistant, and/or alternative positionality was widespread, there was substantial variance in terms of the strategies that these educators choose to navigate these challenges.¹²⁴ This complicated process of negotiation, contestation and collaboration in relation to mainstream schools, is reviewed briefly in this section.

Oppositional Approaches to alternative praxis

Both the PFU and the LVM in India generated an explicitly critical appraisal of Indian Higher Education and an antagonistic orientation to the “corporate” and “mind-enslaving” education, which they contend took place in those spaces (ch 7). This is significant as their critical analysis of the complex influences of global political and economic forces on education differed from educators in Japan and the US and informed their contention that knowledge production in those spaces was hostile to libratory and critical educational endeavors. Both projects in India contextualized their contemporary efforts as a continuation of previous anti-colonial struggles, as they conceptualized the dynamics currently at play in education as directly tied to practices implemented and intensified during the colonial period. Thus they expressed a need for profound philosophical and applied change in education and they highlighted the urgency of a move away from reductionist and mechanistic approaches, which they saw as the

¹²³ As a result they developed alternative approaches both inside of and outside of formal educational spaces that attempted to generate/engage knowledge productions systems

¹²⁴ Explanation: that the control and enclosure of educational processes and spaces as a result of the continued ascendancy of reductionist and mechanistic approaches (and the ongoing influence of capitalist and state interests in mass education) resulted in efforts on the part of peace educators to either move away from and/or work to transform the constraints of these formal environments and methodologies.

hallmark of formal educational endeavors, and served the interests of elites both at home and abroad over the past century in India.

This move away from ‘colonial education’ occurred in the minds of educators who explicitly framed themselves as allies to ‘alternative,’ ‘local’ and ‘indigenous knowledge’ systems. They attempted then to generate projects that could engage and catalyze these ‘subaltern’ forms of knowledge and leverage them as a form of resistance to neo-liberal globalization and to mass educational methodologies. They did so by using informal education spaces (in the communities), involving local participants in designing and facilitating educational processes and generating curricular materials that were explicitly critical of mainstream knowledge practices and of neo-liberal globalization more widely (ch, 7). All of these efforts moved these educators outside of the walls of formal schooling which they perceived as an act of resistance to the tightly mandated pedagogical and curricular demands of those systems which they contended were allied to the interests of ‘elites.’

Their insistence on working outside of formal education, they contended, supported their efforts to develop a praxis that was responsive to the local needs of participants and the unique contexts in which education was taking place. Chapter 7 demonstrated how Indian Peace Educator’s critique of the lack of responsiveness and the need for alternatives to formal educational environments was echoed in the complexity and education literature (Doll, 2005). Laroche, Nicol and Mayer-Smith (2007) argued that radically new approaches informed by complexity not be could generated under the guidance of a mechanistic educational paradigm Popular in mainstream schools (p. 71). While PFU and the LVM sought to disengage from formal education based upon their historical analysis of the role education in reinforcing the status quo and their ontological critique of the pedagogical possibilities that existed within those

spaces, they continually renegotiated what education outside of those spaces could look like.

It is significant then that their attempts at generating new approaches for education in India shifted in response to the on the ground realities of such endeavors over time. For example, (as highlighted earlier in this chapter) the LVM shifted their facilitation strategy integrating local participation in framing, leading and reflecting on conversations. As their project developed they received feedback that their approach was not responsive enough to local interests and needs (ch, 7) and they struggled with trying to maintain their notion of the most effective ways of challenging corporate globalization while also continually responding to the interests and priorities of local communities.

The LVM also increasingly brought people from various epistemic communities to the ashram to participate in discussions about practices that could support the local knowledge production already underway and to adapt developing praxis in light of their ongoing feedback. Significantly, the educators featured in Chapter 7 developed these participatory forms with an explicit focus on creating alternatives outside of and in resistance to formal education in India. This created a host of creative opportunities for developing their curriculum and pedagogy though they found that their location outside of formal institutions did not ensure liberatory practice. Rather they continually had to renegotiate their normative and curricular commitment to alter-globalizing in light of the demands of remaining open to complexity.

Engagement with Formal Schooling

While PFU and LVM drew creative energy from their explicit opposition to formal education in India, chapter 6 examined how educators in Japan and the US conceived of their positionality differently. In Japan, Mister Matsui noted the limitations of mechanistic practices, but he did not position himself in opposition to formal education environments altogether as did

the educators in India. Rather, in seeking to engage with global complexity through the lens of peace education, Matsui, a full time teacher, distanced himself from many of the practices that were central to the mainstream educational approaches he was surrounded by, while at the same time he also made use of the educational spaces and curricular materials and guidelines favored in his school district.

Most notably, he expanded the pedagogical parameters of his approach over time using alternative spaces and creating opportunities for students to engage in applied field research. Significantly, this grew in part from his explicit critique of the shortcomings of an over-reliance on teacher-centered approaches based on his own use of those methodologies over time. Matsui instead explicitly recognized that engaging with the complexity of the world required greater methodological complexity and an expanding array of inter-disciplinary themes over time, which differentiated his approach from many of the other people working in his school. While the pedagogical diversity of the school he worked in was limited he and Mister Suguiera pointed out that peace educators in Hiroshima drew pedagogical inspiration from other peace educators in the region (ch 6).

While Matsui critiqued elements of the status quo of educational methodology and found inspiration from the alternative methodological and ontological framework of peace education globally, he did not frame his positionality in relation to schools as purely oppositional or see himself as outside of the system. His sense of embeddedness was reinforced by the unequivocal support of peace education in the Hiroshima City Schools, as such practices were explicitly valued within the schools system, and allowed Matsui to experiment with increasing methodological complexity with a greater sense of ease. Matsui's case was unique insofar as peace education was more widely accepted in Hiroshima than in any of the other locales

examined and he saw himself as primarily embedded within that system.

Chapter 6 also analyzed The Mosaic project's (US) attempts to develop praxis that engaged complexity. Mosaic staff did not fully position themselves either inside or outside of formal education systems. Rather, they developed curriculum and pedagogy that was used in schools and brought public school children outside of formal educational environments to have a significantly different pedagogical experience at their outdoor camp. Mosaic's hybrid model of engagement required continually negotiating and adapting to the contingent demands of offering an alternative pedagogical framework in these two highly differentiated spacial and social contexts.

Mosaic's outdoor camp was significant as it often provided an opportunity for educators to experiment with participatory and adaptive methodologies and interdisciplinary curriculum in a supportive setting. Mosaic recruited staff with experience from a wide range of methodological backgrounds to facilitate at the outdoor camp and there they developed the arts-based alternative pedagogical approach that became a hallmark of their programs (both in schools and at the camp) over time. Additionally, the camp setting provided a far more diverse range of indoor and outdoor pedagogical spaces to work within than did mainstream schools and the alternative setting allowed Mosaic to break down racial and economic barriers by strategically recruiting students from diverse backgrounds to attend.

As detailed in chapter 6, Mosaic's Director Lara Mendel expressed an ontological vision that at times was in keeping with a complexity lens as she encouraged staff to distribute epistemic authority, to take the lead from the children and to adapt their participatory pedagogies and an interdisciplinary curriculum in response to emergent opportunities. While this emergent approach to praxis was encouraged, Mosaic staff still struggled with the creative demands of

balancing existing pedagogical structures with opportunities for change at the camp. The outdoor camp was not a space without direction nor boundaries as Mosaic developed a core curriculum with established activities that they believed were successful and resilient and which they sought to maintain (to some extent) over time. Mosaic's staff often framed their positionality at the outdoor camp intentionally away from mass educational methodologies as they explicitly positioned themselves as an alternative to mainstream praxis.

While the relatively short and intensive program that Mosaic developed at the camp offered a viable alternative for children not getting many opportunities to engage with peace education that was responsive to global complexity, the camp's positionality also had limitations that increasingly drew Mosaic into greater collaboration with schools.¹²⁵ Chapter 6 examined the sources of resistance, tension, and creative opportunities that emerged as a result of Mosaic's increasing efforts to bring their adaptive and participatory orientation to those formal educational environments. It examined in detail the challenges Mosaic staff faced when attempting to build support for and implementation of more complex approaches to pedagogy and interdisciplinary content in formal educational environments. While the full breathe of those challenges cannot be reviewed here it is important to note that these approaches to generating greater methodological complexity required consistent support for teachers who were co-developing and implementing Mosaic's curriculum which proved difficult inside of formal educational environments that did not always explicitly value these approaches.

Whilst challenging, these tensions between Mosaic's efforts to engage with complexity and their efforts to translate their praxis into formal schooling, at times led to significant

¹²⁵ Student engagement with the outdoor camp was short in duration and therefore limited their ability to build on the changes that took place there. Additionally, while Mosaic saw an increase over time in the number of schools that participated in their outdoor camp programs the camp could accommodate small numbers of students relative to the pool available in the city schools.

innovation, as it required continually innovative approaches. Cut off from some of the well springs of inspiration at the outdoor camp (e.g., diverse staff, student body, residential, nontraditional pedagogical spaces). Mosaic began to identify a wider range of stakeholders to involve in their projects and to facilitate greater connectivity within the school communities. Increasingly they involved parents in engaging with Mosaic's curriculum and asked teachers to co-create curriculum and pedagogical strategies with them. They also increasingly sought student feedback on ways of improving the in-school program by building on its existing strengths and adapting their methods according to that feedback. Mosaic therefore offered a well-developed example of how to distribute epistemic authority and multiply pathways for feedback and participation within the school community over time. Notably, Mosaic demonstrated education on the edge, in their in-school program as they increasingly developed an approach toward educational change that emphasized the need to sustain multiple points of influence within complex systems and required continually enrolling new allies in the school system.

Mosaic was not alone in formulating their theory of change in this way, as CEL, much like Mosaic, maintained a position both inside of and outside of formal educational environments. They developed a complex model for school wide change that sought to counteract the isolation and fragmentation of reductionist and mechanistic frameworks in schools. Chapter 6 examined this tension between CEL's efforts to engage complexity and the schools district's "notorious" resistance to pedagogical and curricular change. CEL was critical of the mechanistic approaches, which simplified the pedagogical and curricular experience and they saw a need radically to alter the flow of knowledge and pathways for engagement within school systems. CEL worked with teachers to create an interdisciplinary curriculum that could help meet state standards and they approached their primary theme of food drawing heavily on

concepts from complexity theory. As Chapter 6 examined, CEL also sought to develop and implement social technologies that could shift pedagogical practices in the schools, so that they were more varied and complex methodologically. They brought together teams from across professional domains that usually did not work directly together (teachers, administrators, lunchroom, and garden staff) and they drew on a host of alternative pedagogical spaces (lunchroom and garden classroom) and implemented a diverse range of hands-on and project based pedagogical strategies.

CEL also created opportunities for schools in the district that were involved with RSL to get together and examine emerging best practices and they also enrolled other stakeholders such as parents, experts with knowledge about food systems and staff at CEL in those discussions. They made their reports and resources available on the internet and welcomed the possibilities for collaboration with people interested in the project beyond the Berkley school district.

In seeking to catalyze greater connectivity, feedback and adaptability in the Berkley city school district, CEL moved from the micro to the macro and back again as they facilitated discussion between schools and with multiple stakeholders in each of the local communities (ch 6). They also explicitly recognized the importance of collaborative frameworks for knowledge production and the chance that changes could ripple out well beyond their local networks. As such, they directed their energy in part toward enabling such processes by creating multiple pathways for dissemination and feedback about the RSL project.

These attempts to create greater connectivity across various scales were demonstrative of a larger pattern of adaptation amongst the peace educators examined in Chapters 6 and 7 as these educators liminal positionality placed them within and between various interconnected nested systems. The LVM and Mr. Matsu sought to build on the possibilities offered by this

interconnectivity as they supported local participants in engaging within multiple networks of affinity and interest that at times included participants in locales around the world. PFU also sought to create moments of convergence in which groups from across India could come together to cross pollinate ideas in relation to educational change and resistance to neo-liberal globalization. The emergent opportunities those convergences offered were critical components of PFU's epistemic 'freedom struggle' as they increasingly challenged the production of knowledge by an 'elite' few as they enrolled more people in their programs even while struggling to develop praxis that was participatory. As Peace educators problematized formal educational methodologies, they increasingly drew on their positionality within multiple nested systems to reconfigure the scope of potential pedagogical spaces, location of potential participants and the range of methodologies that could be used to engage learners across scales.

This sense of engagement and recursivity across multiple scales of complexity was at the heart of the peace educators' sense of agency in relation to global complexity. That glocal positioning provided *multifarious* (even if difficult and at times problematic) opportunities as they either left the pedagogical confines of formal education or sought to redefine the field of possibilities of education by moving from the global to the local and back again. While educators struggled to track and evaluate these changes they still experimented with creating models for engagement, which they believed could generate a ripple effect within and across complex systems. This move away from *reductionist approaches* and toward the edge of chaos redefined the field of possibilities for peace educators, as they distanced themselves from their more tightly defined sense of pedagogical/thematic and special boundaries that often were reinforced in formal educational environments. In stepping away from mass education's insistence on efficiency, control, and predictability they at times developed the ontological resources and

social technologies to support emergent praxes that was congruent with the insights of complexity theory.

Insights for Application

The Role of Teacher-A View from the Edge

Forget your perfect offering. There is a crack in everything. That's how the light gets in.
Leonard Cohen

This examination of both the complexity and education literature and of the cases in India, Japan and the US, supported the conclusion that learning is not primarily the result of simple linear one-on-one relationships such as that between the student and teacher or student and textbook. Rather learning is understood best as a decentralized process, as it is the effect of an entire system of relationships, which can extend far beyond the walls of the school or the imagined boundaries of the nation state.

Those systems are to varying degrees, open and nested within larger systems and this reframes the role of teacher/educator/facilitator by challenging us to think about the collective intelligence of the classroom, school or community and to work to catalyze and draw out the knowledge potential within and between these complex systems. There should be a persistent understanding for complexity educators that individual and collective intelligences are mutually reinforcing and interconnected and that much of the work of education takes place through emergent and self-organizing collectivity that is difficult to predict in advance or steer toward inflexible learning outcomes.

From within this view, one is less likely to speak of a student as failing than to refer to his or her participation in a matrix of relationships that results in weakness, stagnation or atrophy within that learning system. The teacher then is called on to see connections between sets of relationship (or potential relationships) and to imagine ways that these patterns of relationship

may shift to support learning for individuals as well as for the group. Complexity educators who are stuck or struggling might ask: how can knowledge be freed up in the group or drawn from other connected systems to increase the likelihood that learning will take place?

Complexity points toward an alternative view of the role of the teacher asking: How might we “understand and embody... practices so that the complexity of relationships between student and teacher, curriculum and learning, environment and experience are not ignored in the routine of habit of teacher centered authority, but are fraught with tensions, unknowns, balances lost, gained and renewed?” (Doll, 2005, p. 92). The educators featured in this dissertation offered powerful albeit incomplete examples of a complexity ideal, which seek to maximize learning through enabling the minimum amount of structure needed to generate maximum creativity.

A complexity approach moves away from traditional arguments of teacher versus student-centered approaches. Instead, complexity acknowledges that both teachers and learners can occupy multiple roles and degrees of power and control and that learning processes should be, to varying degrees fluid, dynamic, and emergent. Building on the previous exploration of the importance of alternative educational environments, both teacher and learner exist in variable relational dynamics each influencing each other in a complex context that includes multiple systems and nonlinear forces. Thus, learning takes place because of the groups historical influences and the emergent context and larger system effects that exert influence on the dynamics of any given process. In the cases examined in this dissertation, this variability resulted in multifarious and adaptive interpretations of pedagogical possibility and curricular priorities.

An insight from complexity theory is that systems change is in large part a result of feedback mechanisms, and the creation, amplification and altering of feedback mechanisms plays a key role in the health of organisms and other living systems. Increasing feedback

mechanisms can be of great help to teachers in their attempts to promote greater self-awareness and self-organization within and between the groups they are working with. Complexity educators in formal education might ask: Where is feedback occurring? How is that effecting learning and communication? Where are their alternative pathways for feedback? In terms that are more practical, teachers must continually question: How can students provide more feedback to each other? How can there be more feedback between teachers (all staff) and students? How can all parties involved bring in their experiences and integrate their knowledge from the larger worlds of which they are a part? How can all learners/teachers reflect together on these challenges and opportunities?

Complexity educators are challenged then to work on multiple fronts at once and to reconceptualize educative relationships with students, parents, administrators, staff, community members, and people of affinity and interest more broadly in collaborative frameworks. Complexity theory suggests that educators be catalysts within and between various learning collectives-that they support communication, challenge places where energy is blocked, help build relationships and engage multiple parties in considering and shaping the curriculum. The educators interviewed in this dissertation suggested that such approaches make education more responsive to complexity and equally importantly, relevant to contemporary learners. From a complexity point of view, the “connection between knowledge and identity is a vital one for learners to make, for it establishes the clearest rationale for participating...it shows unequivocally the importance of the selections we make and the difference we generate” (Doll, 2005, p. 243). The complexity teacher then, seeks (in part) forms of education, which make clear why the learning that is taking place is relevant, not in that they proselytize about its relevance but rather that it becomes evident to learners through their engagement with complexity over time.

Given this framing, complexity educators need a robust social intelligence working with multiple lenses and approaches as they navigate the complexity of supporting learning within interconnected and overlapping contexts with individuals from a potentially broad range of backgrounds. This dissertation offered concrete examples of the wide range of social technologies used by educators to develop this type of situational responsiveness. Complexity reconfigures the role of teacher by recognizing the potential that all contexts and relationships can play a vital role in education by continually encouraging “an ongoing bringing forth of a world through the process of living itself” (Maturana & Valera, 1998, p. 78). On a deeper epistemic level, it deconstructs the ascendancy of linear causality in educational processes and reconfigures ontological priority distributing epistemic authority and opening up more complex pathways for participation.

Educating on the Edge

While there was a move away from highly centralized epistemic authority in no cases did these educators completely abandon some sense of responsibility for the outcomes of educational process as they continually sought to read emergent processes in light of the set plans, goals and structures that were in place—in other words to teach on the edge of chaos. Chapter 6 and 7 illustrated a wide range of variability in terms of the degree of authority/responsibility educators negotiated in response to this ontological orientation toward the field, which differed greatly from mass educational methodologies.

That orientation to the edge, did not remain constant within a specific case as educator’s methodologies often fluctuated in relation to the demands of specific pedagogical moments. For example, Matsui took a more teacher centered approach in the classroom then he did when engaging students in the field and yet he did sometimes step back and support students in leading sessions in the classroom. Each of the educators faced different constraints and opportunities, as

Matsui (unlike all the other educators featured in this dissertation), worked as a teacher in the schools system full time and thus was more beholden for translating learning in ways that made sense to his managers in the institutional context where he was located.

While this dissertation emphasized the divergence of such practices on the edge of chaos from mechanistic and reductionist approaches, this responsive and creative orientation is often what good teachers do. The intuitive actions of many teachers, operating within a creative pedagogic environment often demonstrates an implicit familiarity with the edge of chaos, a sense that emergent opportunities can be engaged without being totally anarchic and that those opportunities can be continually ‘balanced’ with existing structure and plans without being stifling. It is important to note then that while the field research featured in this dissertation established that peace educator’s glocal location often resulted in a move toward the edge providing robust opportunities to generate praxis that is congruous with some of the insights of complexity theory, peace educators are not alone in their engagement with complexity. However, given this author’s contention that the demands of educating in a globally complex world require a wider range of social technologies and ontological perspectives than is typically employed and accepted in mass education, peace educators often found themselves in the precarious and generative position of expanding the field of possibilities in education.

It is significant from a deeper ontological point of view that by exploring emergent forms of pedagogical complexity teachers model the kind of creative uncertainty necessary for making sense within complex emergent circumstances. As the teacher embraces complex methodological habits rather than trying to deny and control complexity she or he, permits the cracks to appear for learning to happen. The educator then is taking risks, removing the facade of the impeccable expert and making it known that the learning process is in part a mystery, which that people

discover together.

Utilizing a complexity lens underscores the opportunity to engage with the creative forces both actual and potential within these complex processes that teachers are embedded and participating in, rather than being tied to a simplistic preordained pedagogical forms, which are neither sensitive nor responsive to the dynamism of fluid and highly varied contexts. The idea that “the teacher is ultimately responsible for the pedagogical success of the classroom...”¹²⁶ largely is deconstructed by complexity theory. In the ideal, the pedagogy used within education should mirror a wider range of the complex and diverse relationships ‘out there’ in the world as teachers, learners, administration, and community are involved in a process of “interstanding.”¹²⁷

While the teacher is not “ultimately” responsible for the learning that takes place, they do bear unique responsibility for it. This alternative view of teachers suggest the need for supporting an expanded skill set as educators are challenged to employ a range of methodological approaches in the varied contexts in which they have influence. Complexity and education researcher, Rasmussen suggests that in the classroom, “we must switch between different degrees of control in teaching, from teacher controlled class teaching through organization of teaching activities of a more independent nature to completely free forms of working” (Doll, 2005, p. 231). This emphasis on situational adaptability within the literature on complexity and education indicates a need within contemporary education for a shift toward participatory pedagogies over ‘teacher centered’ styles and for collective processes over individual work as the scales currently are tipped in the other direction. Learning from a complexity viewpoint cannot be primarily a solitary process and that the teacher or facilitator need invite everyone to

¹²⁶ p3
¹²⁷ p93

contribute to what is not known yet (Fels, 2004).

In all, complexity makes a case for the loosening of pedagogical restraints that are often taken for granted within formal educational systems and it joins a host of progressive voices (Dewey, 1902; Friere 1970; Robinson, 2011) in asserting that curricular explorations need not be limited to lectures, sedentary work at ones desk, or the confines of indoor classrooms spaces. Rather, complexity informed education opens the door for a radical rethinking of the potential spaces and approaches used within education. It offers insight into how to support praxis that strives toward being a continually adaptive and responsive endeavor. This dissertation has contended that this shift in educational orientation is needed in light of the pressing social and ecological challenges we now face and the local-global locations in which we now find ourselves.

Limitations

While this study was able to obtain many of its primary aims in terms of exploring the utility of complexity theory as an analytical lens for reading peace educator's responses to global complexity, there were limitations to this research that are worth acknowledging. First, there were numerous limitations related to the snowball sampling methods employed in this study. Most notably because I did not draw from a more randomized sample of peace educators it is difficult to tell the degree to which the sample is representative of the larger population of peace educators in each of the countries studied. However, in the study of global complexity and international peace education, where connectivity between people and the networks and organizations they participate in is a core element of their work, network based snowball sampling methods like those employed in this study can be beneficial by elucidating network structures and participants attitudes and perspectives within those networks.

Second, this research involved over 50 interviews, yet only a portion of that data was presented in this study. I made this choice because it allowed me to focus more in-depth on the experiences of the educators featured and to emphasize the nuance, subtlety and rich details of their embedded encounters with global complexity. This included ethnographic analysis of the contexts in which these educators were situated and their evolving understanding of their work over time. However, this choice to focus on only a few educators limited the analysis and representation of the overall scope of opportunities and challenges that some peace educators identified in their interviews.

Third, this study examined the possibilities for teaching on the edge of chaos by focusing on the attitudes, experiences and perspectives of educators. While this provided insights into the contingent demand, opportunities and struggles of facilitating in the field, it lacked a fully developed account of students and other stakeholder's experiences, which could have further contextualized and developed the findings. Furthermore, the global scope of this research project which focused on localized actors combined with the relatively short duration of the initial research project made it challenging to conduct follow up interviews with educators and wider stakeholders.

Fourth, the time-constraints of this project, the lack of existing academic research at the nexus of complexity theory and education and the snowball sampling techniques made it difficult to locate projects that were consciously using complexity theory in the countries in which the interviews were conducted. This necessitated a broadening of my analysis to include a wider array of educators developing pedagogical approaches congruous with complexity theory. On the other hand, having more practitioners engaged directly with complexity theory would have created opportunities for greater balance between participants voices vis-à-vis the researcher, as I would

not have had to triangulate practitioners' narratives with the academic literature as frequently. However, it would have also narrowed the scope of this research to those educators currently engaged in work reflecting understanding of complexity theory and, thus, limited the some of the applicability of this research in terms of examining pedagogical approaches that were congruous without such prior knowledge. The balance therefore between greater expertise of participants and breadth of applicability necessitated the approach chosen.

Finally, this study aims to understand the development and impact of educational projects within complex systems by employing the descriptive explanatory resources of complexity theory. However, complexity theory disrupts notions of ontological priority and causality generating tensions with regard to these attempts to measure the effectiveness of peace education. While these tensions were examined at length in the methodology chapter, they highlight the limitations of contemporary assessment tools given the challenges of engaging with complexity.

Future Research

The development of strategies by peace educators to either create alternative knowledge systems or shift formal educational systems so that they can be more responsive to global complexity is an under-examined area in educational research. This thesis highlighted a host of ways in which peace educators in India, Japan and the US generated complex pathways for local-global participation in those projects. Indeed the potential for such glocal participation is a hallmark of contemporary times where people (especially economically privileged people) increasingly have access to high-speed communication, travel and global media. These projects raise important methodological questions for future research. How do we track and understand the diffusion of ontological and methodological innovation in global education? Further, how

can we understand how these innovations are organically changing as they migrate within and across multiple complex systems, especially when the dispersal of educational ideas can span great distances, involve large numbers of people virtually, travel, and change quite quickly?

From the perspective of a single researcher, the complexity of educational change at a global level can be simply overwhelming. This thesis narrowed that complexity and therefore was methodologically limited in that it traced pedagogical and curricular change mostly through the experiences of educators and not students, community members or other stakeholders within these formal and informal educational systems. Yet if we are to understand the possibilities for learning within complex knowledge production systems then further research is needed into the dynamics and processes at play within global educational ‘networks’ and how broader stakeholders may be influencing local praxis and vice versa.

If educational researchers are to remain relevant, these global patterns and processes of communication, collaboration, and transformation deserve further analysis. The methodological reflections in Chapter 5 suggest that participatory action research may hold some of the answers to broadening global research of educational change as participants situated in various positions can engage in research and track changes from within the systems of which they are a part. However, how such global research projects can be organized and how data can most effectively be examined is far from clear. What is clear is that these new praxis is being developed in part through new forms of discourse, methodological practices and a greatly expanded sense of identity in the field of education for peace. These developments require serious ongoing examination if we are to understand the potential these moments hold for generating novel approaches to education that are relevant in an age of global complexity.

Bibliography

- (2002). Language in India: Strength for today and bright hope for tomorrow. (2)5 M. S. Thirumalai. (Ed.). <http://www.languageinindia.com/aug2002/indianmothertongues1961aug2002.html>
- (2005). *The decline of education outside the classroom: Second report of session, Great Britain. Parliament.* House of Commons. Education and Skills Committee.
- Adams, E. M. (1997). *A society fit for human beings.* New York: Syracuse University Press.
- Amber waves: Balancing nutrition, participation, and cost in the national school lunch program. <http://www.ers.usda.gov/AmberWaves/September08/Features/BalancingNSLP.htm>
- Anderson, S. E. (2000). *The school district role in educational change: A review of the literature.* International Centre for Educational Change Ontario Institute for Studies in Education.
- Aspeslagh, R. & Burns, R. J. (1996). *Three decades of peace education around the world: An anthology.* New York: Garland Publisher
- Atkins, V. et al., (2010) *An evaluation of the school lunch initiative: Final report* http://www.ecoliteracy.org/sites/default/files/sli_eval_full_report_2010.pdf
- Andrews, G., Halford, G. S., Bunch, K. M., Bowden, D. and Jones, T. (2003). Theory of mind and relational complexity. *Child Development, 74* 1476-1499.
- Atkinson, P. (1990). *The Ethnographic Imagination.* London: Routledge.
- Ardizzone, L. (2001). Towards global understanding: The transformative role of peace education. *Current Issues in Comparative Education 4*(1).
- Bajaj, M. (2010). Conjectures on peace education and Gandhian studies: Method, institutional development and globalization *Journal of Peace Education*, v7 n1 p47-63 Mar 2010
- Bai, H. & Banack, H. (2006). To see a world in a grain of sand: Complexity ethics and moral education. *Complicity: An International Journal of Complexity and Education 3*(1).
- Bajaj, M. (2008). *Encyclopedia of peace education.* Charlotte, NC: Information Age Publishing.
- Bajaj, M. (2010). Conjectures on peace education and Gandhian studies: Method, institutional development, and globalization. *Journal of Peace Education. 7*(1), 47-62.
- Barry, C. M. & Wentzel, K. R. (2006). Friend influence on prosocial behavior: The role of motivational factors and friendship characteristics. *Developmental Psychology 42*(1) 153-163.
- Basole, A. (2010). The social basis for radical change in India *Wikipedia conference*, <http://www.vidyaashram.org/videos.html>

- Bateson, G. (1972). *Steps to an ecology of mind*. Chicago, IL: University of Chicago Press.
- Bauman, Z. (2000). *Liquid Modernity*. Cambridge: Polity Press.
- Berk, L. & Winsler, A. (1995). Vygotsky: His life and works and Vygotsky's approach to development. In *Scaffolding children's learning: Vygotsky and early childhood learning*. Washington, DC: National Association for the Education Of Young Children.
- Blackman, P. (2008). A new science look at negotiating. *Curriculum and Classrooms Complicity: An International Journal of Complexity and Education* 5(1).
- Boal, A. (2000) *Theatre of the oppressed*, London: Pluto Press.
- Boal, A. (1985). *Theatre of the oppressed*. New York: Theatre Communications Group.
- programs for elementary school children. *Applied Preventive Psychology*, 10(1), 1-35.
- Bohm, D., Donald Factor, D., Peter Garrett, P. (1999). Dialogue—A proposal. http://www.david-bohm.net/dialogue/dialogue_proposal.html
- Borsa, J. (1990). Toward a politics of location: Rethinking marginality. *Canadian Women Studies* 11 36-39.
- Boulding, K. E. (1978). *Stable peace*. Austin: University of Texas Press.
- Borden, L. (2009). Using poetry to help understand one child's behaviors. Assignment submitted as part of the course requirements for 9576 Narrative Inquiry, University of Western Ontario, London.
- Bower, D. F. (2006). Sustaining school improvement. *Complicity: An International Journal of Complexity and Education* 3(1).
- Brock-Utne, B. (1985). *Educating for peace: A feminist perspective*. New York: Pergamon Press.
- Brock-Utne, B. (1986). Feminist perspectives on peace and peace research. PRIO-report.17/86. 1986
- Buckman, P. & Illich, I. (1973). *Education without schools*. Oxford: Taylor and Francis.
- Burns, R. J. & Aspeslagh, R. (1983). The debate on education for peace. *International Review of Education / Internationale Zeitschrift für Erziehungswissenschaft / Revue Internationale de l'Education* 29(3) 311-330.
- Buroway, M. (2006). *Address delivered to Portuguese Sociological Association*. March 30, http://en.wikipedia.org/wiki/Gulbenkian_commission
- Byrne, D. (1998). *Complexity theory and the social sciences*. London: Routledge.
- Byrne, D. (2001). What is complexity science? Thinking as a realist about measurement and

- cities and arguing for natural history. *Emergence* 3(1) 61-76.
- Byrne, D. (2002a). *Interpreting quantitative data*. London: Sage.
- Byrne, D. (2002b). Complexity science and transformations in social policy. *Social Issues* 2.
- Byrne, D. (2005). Complexity, configurations and cases. *Theory, Culture and Society* 22 95.
- Byrne, D. (2009a). *Working within a complexity frame of reference—the potential of ‘integrated methods’ for understanding transformation in complex social systems*. Contribution toward the CFSC Consortium’s paper for UNAIDS on expanding the monitoring and evaluation of Social Change Communication for HIV/AIDS prevention.
http://www.communicationforsocialchange.org/pdfs/working%20withn%20a%20complexity%20frame_d%20byrne.pdf
- Byrne, D. & Ragin, C. (eds.) (2009b). *The sage handbook of case-based methods*. London: Sage.
- Capra, F. (1999). *Ecoliteracy: The challenge for education in the next century*. Liverpool, UK: Schumaker lectures.
- Capra, F. (2002). *The hidden connections: Integrating the biological, cognitive, and social dimensions of life into a science of sustainability*. New York: Doubleday.
- Castells, M. (2006). *Mobile communication and society: A global perspective*. Cambridge, MA: MIT Press.
- Chase, S. E. (2005). Narrative inquiry: Multiple lenses, approaches, voices. In Norman K. Denzin & Yvonna S. Lincoln (Eds.). *The handbook of qualitative research*. 3rd ed. 651-679).
- Chambliss, J. J. (ed.). (1996). *Philosophy of education: An encyclopedia*. New York: Garland Publishing.
- Chapman, L., Morabito, D., Ladakakos, C., Schreier, H. & Margaret Knudson, M. M. (2001). The effectiveness of art therapy interventions in reducing post-traumatic stress disorder (PTSD) symptoms in pediatric trauma patients art therapy. *Art Therapy: Journal of the American Art Therapy Association* 18(2)
- Center for ecoliteracy: <http://www.ecoliteracy.org/>
- Chesters, G. (2005). *Encyclopedia of social theory*. Thousand Oaks, CA: Sage Publications.
- Chesters, G. (2007). Global uprisings: Towards a politics of the artisan (with Michal Osterweil) in Graeber, D. & Shukaitis, S. *Constituent Imaginations*. Edinburgh, Scotland: AK Press.
- Chesters, G. & Welsh, I. (2007). *The death of collective identity? Global Movement as a Parallelogram of Forces*. International Sociological Association’s XVI World Congress Research Committee 47: Social Movements and Social Classes.

- Chow, N. L., Fleck, C. Fan, G. H., Joseph, J. & Lyter, D. M. (2003). Exploring Critical Feminist Pedagogy: Infusing Dialogue, Participation, and Experience in Teaching and Learning. *Teaching Sociology* 31(3) 259-275.
- Cilliers, P. (1998). *Complexity and postmodernism*. London: Routledge.
- Cilliers P. (2005). Complexity, deconstruction and relativism. *Theory, Culture and Society* 22(5) 95-111.
- Clayton, C. J., Ballif-Spanvill, B. & Hunsaker, M. D. (2001). Preventing violence and teaching peace: A review of promising and effective antiviolence, conflict-resolution, and peace.
- Connelly, F. M. & Clandinin, D. J. (1990). Stories of experience and narrative inquiry. *Educational Researcher*, 19(5), 2-14.
- Coveny, P. & Highfield, R. (1995). *Frontiers of complexity: The search for order in a chaotic world*. London: Faber.
- Darder, A. Baltodano, M. P. & Torres R. D. (Eds.) (2009). *The critical pedagogy reader*. New York: Routledge.
- Davies, L. (2004). *Education and conflict: Complexity and chaos*. New York: Routledge Falmer
- Davies, L. (2004). Building a Civic Culture Post-Conflict. *London Review of Education* 2(3).
- Davies, L. (2003). *Education and conflict: Complexity and chaos*.
- Davies, B. (2005). Interrupting frameworks: Interpreting geometries of epistemology and curriculum. *Chaos, Complexity, Curriculum and Culture* (eds.) W. Doll Jr., M. J. Fleener, D. Truit, J. St. Julien. Berlin, Germany: Peter Lang Publishing.
- Davis, B. & Phelps, R. (2004). *Complicity: An International Journal of Complexity and Education* 4(1) 1-4.
- Dawe, G. Jucker, R. & Martin, S. (2005). *Sustainable development in higher education: current practice and future developments*. Published by the Department for Education and Skills, London
- De Cuellar, J. P. & Cho, Y. S. (Eds.) (1999). World encyclopedia of peace. *Oceana Publications* 2 Sub-edition.
- Deetz, S. (1992). *Democracy in the age of corporate colonization: Developments in communication and the politics of everyday life*. Albany, NY: SUNY Press.
- Degravelles, K. H. (2009). Recursive readings: Chaos, curriculum, and Walt Whitman in "Specimen Days" *Complicity: An International Journal of Complexity and Education* 6(1) 46-57.
- DeLanda, M. (2004). *Intensive science and virtual philosophy*. London: Continuum.

- Dentith, A. M. (2004). Female adolescent subjectivities in Las Vegas: Poststructuralist thoughts on the intersection of gender, sexuality, consumer logic and curriculum. *Gender and Education* 16(4) 456-472.
- Denzin, N. K. (2006). *Qualitative inquiry and the conservative challenge*. Walnut Creek, CA: Left Coast Troika.
- Denzin, N. K. (1997). *Interpretive ethnography: Ethnographic practices for the 21st century*. Thousand Oaks, CA: Sage Publications.
- Denzin, N. K. & Lincoln, Y. S. (2000). *Handbook of qualitative research*. Thousand Oaks, CA: Sage Publications.
- Dewey, J. (2001). *The school and society and the child and the curriculum*. Mineola, NY: Dover Publications, INC.
- Dewey, J. (1923). The schools as a means of developing a social consciousness and social ideals in children. *Journal of Social Forces* 1.
- Dicker, G. (1998) *Hume's epistemology and metaphysics: An introduction*. New York: Routledge.
- Doll, W. E. (2005). The culture of method. *Chaos, Complexity, Curriculum and Culture* (eds.) W. Doll Jr., M. J. Fleener, D. Truit, J. St. Julien. Berlin, Germany: Peter Lang Publishing.
- Duckworth, C. (2008). Maria Montessori's contribution to peace education. *Encyclopedia of Peace Education*. Charlotte, NC: Information Age Publishing.
- Duncan, H. (1985). *Communication and social order*. New Brunswick, NJ: Transaction Books.
- Dyson, M. (2007). My story in a profession of stories: Autoethnography—An empowering methodology for educators. *Australian Journal of Teacher Education* 32(1)3
- Ellis, C. (2000). Creating criteria: An ethnographic short story. *Qualitative Inquiry* 6 273-274.
- Ellis, C. (2002). Take no chances, *Qualitative Inquiry* 8 42-47.
- Ellis, C. & Bochner, A. (Eds.) (1996). *Composing ethnography: Alternative forms of qualitative writing*. Walnut Creek, CA: Alta Mira Press.
- Emmel, N. & Hughes, K. & Greenhalgh, J. & Sales, A. (2007). Accessing socially excluded people: Trust and the gatekeeper in the researcher-participant relationship. *Sociological Research Online* 12.
- Escobar, A. (2008). *Territories of difference: place, movements, life, redes*. Durham, NC: Duke University Press.
- European Council for Steiner Waldorf Education. <http://www.steinerwaldorfeurope.org/>

- Fels, L. (2004). Complexity, teacher education and the restless jury: Pedagogical moments of performance. *Complicity: An International Journal of Complexity and Education* 1(1).
- Fisher, B. (1987). The heart has its reasons: Feeling, thinking, and community-building in feminist education. *Women's Studies Quarterly* 15(3/4) 47-58.
- Freire, P. (1972). *Pedagogy of the oppressed*. London: Penguin Group.
- Fraser, M., S. Kember and C. Lury (eds) (2005) Inventive Life: Approaches to the New Vitalism. Special Issue of *Theory, Culture & Society* 22(1): 1-14.
- Fry, M. & Goldstein, E. & Langhorne, R. (2002). *Guide to international relations and diplomacy*. London New York: Continuum.
- Gadamer, H. G. (1979). *Truth and method*, London: Sheed and Ward.
- Gallagher, K. (2000). The everyday classroom as problematic: A feminist pedagogy. *Curriculum Inquiry* 30(1).
- Galtung, J. (1969). Violence and peace. *Journal of Peace Research* 6(3) 167-191.
- Galtung, J. & Gewalt; K. (1993). *in: Der Bürger im Staat* 43(2) 106.
- Galtung, J. (2004). *Transcend and transform: An introduction to conflict work*. London: Pluto Press.
- Gardner, H. & Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. *Educational Researcher* 18(8) 4-9.
- Gerard, C. (2003). Addressing otherness: The role of the arts in peace education
http://gseweb.harvard.edu/~t656_web/peace/Articles_Spring_2003/Gerard_Celia_ArtsInPeaceEd.htm
- Gidley, J. M. & Inayatullah, S. (2002). *Holistic education and visions of rehumanized futures* (Eds.) *Youth Futures: Comparative Research and Transformative Visions*. Praeger: Westport, Connecticut 155-167.
- Ginsburg, I. H. (1982). Jean Piaget and Rudolf Steiner: Stages of child development and implications for pedagogy. *Teachers College Record* 84(2).
- Girard, K. L. (1996). Preparing teachers for conflict resolution in the schools. *Educational Research Information Center Digest* 94(4). Retrieved from ERIC database. (ED387456)
- Gladwell, M. (2000). *The tipping point: How little things can make a big difference*. London: Little, Brown and Company.
- Giddens, A. (2003). *Runaway world: How globalization is reshaping our lives*. New York: Routledge.

- Goertz, D. B. (2001). *Children who are not yet peaceful: Preventing exclusion in the early elementary classroom*. Berkeley, CA: Frog.
- Goldstein, R. (2005). A symbolic and institutional violence and critical educational spaces: In the name of education. *Journal of Peace Education* 2(1) 33-52.
- Greider, W. (1993). *Who will tell the people: The betrayal of American democracy*. New York: Simon & Schuster.
- Grimes, D. S. & Parker, P. S. (2008). Imagining organizational communication as a decolonizing project: In Conversation With Broadfoot, Munshi, Mumby, and Stohl. *Management Communication Quarterly* 22(3) 502-511.
- Grumet, M. (2004). No one learns alone. In Rabkin, N. & Redmond, R. (Eds.) *Putting the Arts in the Picture: Reframing Education in the 21st Century*. Columbia College Chicago: Chicago, IL.
- Gutjahr, W. J. (2008). First steps to the runtime complexity analysis of ant colony optimization. *Computers and Operations Research* 35(9) 2711-2727.
- Haig, E. (2001). Critical pedagogy, ecoliteracy, and planetary crisis: The ecopedagogy movement Richard Kahn (ed.). *A Study of the Application of Critical Discourse Analysis to Ecolinguistics and the Teaching of Eco-Literacy*. <http://www.lang.nagoya-u.ac.jp/proj/genbunronshu/22-2/haig.pdf>
- Hainstock, E. (1997). *The Essential Montessori*. New York: Plume.
- Hale, C. R. (2001). What is activist research? *Items & Issues* 2(1-2) 13-15.
- Halford, G. S. Andrews, G. Dalton, C. Boag, C. & Zielinski, T. (2002). Young childrens performance on the balance scale: The influence of relational complexity. *Journal of Experimental Child Psychology* 81(4) 417-445.
- Hammersley, M. (1995). *Ethnography: Principles in practice*. London New York: Routledge.
- Hanh, T. N. (1998). *Interbeing: Fourteen guidelines for engaged Buddhism*. Berkeley, CA: Parallax Press.
- Harris I. M. (2002). *Peace Education Theory*. Paper presented at the Annual Meeting of the American Educational Research Association (83rd, New Orleans, LA, April 1-5).
- Harris, I. M. (2004). Peace Education Theory. *Journal of Peace Education* 1(1) 5.
- Harris, I. M. (2008). History of peace education. *Encyclopedia of Peace Education*. Charlotte, NC: Information Age Publishing.
- Harris, I. M. (ed.). (1996). Special edition: Peace education in a postmodern world. *Peabody Journal of Education* 71(3).

- Harris, I. M. & Morrison, M. L. (2003). *Peace education*, 2nd Ed. London: McFarland & Company.
- Harris, M. (2008). The effects of music instruction on learning the Montessori classroom. *Montessori life: A publication of the American Montessori society* 20(3) 24-31.
- Harris, M. A. (2007). Differences in mathematics scores between students who receive traditional Montessori instruction and students who receive music-enriched Montessori instruction. *Journal for Learning through the Arts* 3(1).
- Hatano, G. & Inagaki, K. (1986). *Two courses of expertise: Child development and education in Japan*, H. Stevenson, J. Azuma & K. Hakuta (Eds.), New York: W. H. Freeman & Co. 262-272.
- Held, D. (2002). *Globalization/anti-globalization*. Malden, MA: Polity Blackwell Publishers.
- Hempel, C. G. (1965). *Aspects of Scientific Explanation and other essays in the philosophy of science*. New York: The Free Press.
- Heywood, S. J. (1999). Peace education for youth. In: P. de Cuellar, J. and Y. S. Choue (eds.). *World encyclopedia of peace*. 2nd Ed. New York, Oceana Publications. 196-199.
- Hicks, D. (1995). *Visions of the future: Why we need to teach for tomorrow*. Stoke-on-Trent, Staffordshire, England: Trentham Books.
- Hiroshima children's peace monument*. <http://www.city.hiroshima.lg.jp/shimin/heiwa/crane.html>
- Hobsbawn, E. (1998). *Uncommon people: Resistance, rebellion and jazz*. New York: New Press.
- Hobsbawn, H. (1996). *The Age of Extremes*. New York: Vintage Books.
- Homer-Dixon, T. F. (1994). Environmental scarcities and violent conflict: Evidence from cases. *International Security* 19(1) 5-40.
- Horn, J. (2008), Human research and complexity theory. *Educational Philosophy and Theory*, 40 130-143
- Houghton, R. S. (1989). *A chaotic paradigm: An alternative worldview of the foundations for educational inquiry*. (Doctoral dissertation). Available at: <http://www.wcu.edu/ceap/houghton/thesisM/chaosthesis.html>
- Houghton, J. et al., (2001). Intergovernmental panel on climate change. Climate change 2001: Working group I: The scientific basis, IPCC, <http://www.ipcc.ch/>
- Howlet, C. F. (2008). John Dewey and Peace Education. *2008 Encyclopedia of Peace Education*, Teachers College, Columbia University. <http://www.tc.edu/centers/epe/>
- Human development reports: Annual report for 2006. <http://hdr.undp.org/en/>

- Hutchison, D. (2004). *A natural history of place in education*. London: Teachers College Press.
- Inger, M. (1991). *Conflict resolution programs in schools*. ERIC digest no.74. New York: ERIC Clearinghouse on Urban Education. ED 338791.
- Intergovernmental panel on climate change* <http://www.ipcc.ch/>
- Informal Education Database*. <http://www.infed.org/thinkers/>
- Johnson, S. (2001). *Emergence: The connected lives of ants, brains, cities, and software*. New York: Scribner.
- Jones, R. (2004) *Soft Machines: Nanotechnology and Life*. Oxford: Oxford University Press
- Judis, J. (2000). *The paradox of American democracy: Elites, special interests, and the betrayal of the public trust*. New York: Pantheon Books.
- Kakas, K. (2009). Using drawing with an American urban 6th grade class to enhance learning of an interdisciplinary social studies curriculum. *International Journal of Interdisciplinary Social Sciences* 4(12) 75-82.
- Kang, S. (2006). Peace Education Methodology beyond Prejudices : Korean Field Trip to Osaka, Japan. *Hitotsubashi Journal of Social Studies*, 38(2) 141-151
- Karrow, D. D. (2006). *Educating-within-place: Recovering from metaphysics as technicity*, (Doctoral dissertation). Retrieved from dissertations and theses database (UMI No. NR15772).
- Kelly, T. (1964). A history of adult education in Great Britain. *History of Education Quarterly* 4(1) 75.
- Kelly, A.E. & Lesh, R.A. (2008). *Handbook of design research methods in education: Innovations in science, technology, engineering, and mathematics learning and teaching*. New York London: Routledge.
- Kennedy, S. N. & Kennedy, D. (2010). Between Chaos and Entropy: Community of Inquiry from a Systems Perspective. *Complicity: An International Journal of Complexity and Education* 7(2) 1-15.
- Kentel, J. A. & Karrow, D. (2007). Mystery and the body: Provoking a deep ecology through the situated bodies of teacher candidates. *Complicity* 4(1) 85-101.
- Kidd, R. (1984). Part I: Candles in the storm. Popular theatre and nonformal education in the Third World: Five strands of experience. *International Review of Education* 30(3) 265-287.
- Kieren, T. & Simmt, E. (2009). Brought forth in bringing forth. *The Inter-Actions and Products of a Collective Learning System* *Complicity: An International Journal of Complexity and*

Education Volume 6(2) 20-28.

- King, M. L. Jr. (1963). Letter from Birmingham jail. *The Norton Anthology of African American Literature 1854-1866.* (Eds.) H. L. Gates, Jr. & N. Y. McKay. New York: Norton.
- Kirshner, D., Kellogg, D. L. (2009). Vygotsky as muse to complex learning/teaching. *Complicity: An International Journal of Complexity and Education 6(1) 45-55*
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* Englewood Cliffs, NJ: Prentice-Hall.
- Korab-Karpowicz, W. J. (2010). Political realism in international relations. *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.)
- Krishnamurti, J. (1992). *Individual society: A study book of the teachings of J. Krishnamurti.* Ojai CA: Krishnamurti Publications of America.
- Kumar, R. Sethi A. & Sikka. S. (eds.) (2005). *School, society, nation: Popular essays in education.* Mumbai, India: Orient Longman Private Limited.
- Langton, C. G. (1990). Computation at the edge of chaos. *Physica D 42 12-37.*
- Lamda, M. D. (2002). *Intensive Science & Virtual Philosophy.* London: Continuum.
- Laroche, L. Nicol, C. & Mayer-Smith, J. (2007). New venues for science teacher education: Self-organizational pedagogy on the edge of chaos, *Complicity: An International Journal of Complexity and Education 4(1) 71.*
- Laszlo, E. (1986). *World encyclopedia of peace.* NY: Pergamon Press.
- Lather, P. (1991). *Getting smart: Feminist research and pedagogy within the postmodern.* New York: Routledge.
- Lather, P. (1998), Critical pedagogy and its complicities: A praxis of stuck places. *Educational Theory 48 487-497.* DOI: 10.1111/j.1741-5446.1998.00487.x
- Law, J. (2004). *After method: Mess in social science research.* London New York: Routledge.
- Lederach, J. P. (2005). *The moral imagination: The art and soul of building peace.* New York: Oxford University Press.
- Leveton, E. (2010). *Healing collective trauma with sociodrama and drama therapy.* New York: Springer Pub. Co.
- Lillard, P. (1996). *Montessori Today.* New York: Schocken Books.
- Lincoln, Y. S. & Guba, E., G. (2000). Paradigmatic controversies, contradictions and emerging confluences. In N. K. Denzin & Y. S. Lincoln (Eds.) *Sage handbook of qualitative research*, 4th ed. Newbury Park, NJ: Sage Publications.

- Lovelock, J. E. (1979). *Gaia: A new look at life on earth*. Oxford, UK: Oxford University Press.
- Luke, C. & Gore, J. (Eds.) (1992). *Feminisms and critical pedagogy*. New York: Routledge.
- Maasen, S. and P. Weingart (2000) *Metaphors and the Dynamics of Knowledge*. London: Routledge
- Malone, T. (2009). All together now (or, can collective intelligence save the planet?) *MIT Sloan Management Review* 50(4) 1-7.
- Manicom, A. (1992). Feminist pedagogy: Transformations, standpoints, and politics. *Canadian Journal of Education / Revue canadienne de l'éducation* 17(3) 365-389.
- Marshall, M. N. (1996). *Sampling for qualitative research Family Practice*. 13(6) 522-526.
- Mason, R. (2006). *Alternative and complementary therapies* 12(1) 29-34.
doi:10.1089/act.2006.12.29.
- Mason, M. (2008). *Complexity theory and the philosophy of education*. Malden, MA: Wiley-Blackwell.
- Masters, B. & Rawson, M. P. (2010). Steiner education and social issues: How Waldorf schooling addresses the sustainable teacher learning in Waldorf education: A socio-cultural-perspective. *Research on Steiner Education* 1(2) 26-42.
- Maturana, H. R., & Varela, F. J. (1998). *The tree of knowledge: The biological roots of human understanding* (Rev. ed.). Boston, MA.: Shambhala
- McKinley Jr., J. C. (2008). In Texas school, teachers carry books and guns <http://www.nytimes.com/2008/08/29/us/29texas.html>
- McLuhan, M. (1964). *Understanding media: the extensions of man*. Cambridge, MA: MIT Press.
- McDaniel, R. R. Jr.; Jordan, M. E. & Fleeman, B. F. P (2003). Surprise, surprise, surprise! A complexity science view of the unexpected. *Health Care Management Review* 28(3) 266-278.
- McMillan, E. (2004). *Complexity, organizations and change*. New York: Rutledge.
- Meyer, A. E. (1969). *Development of education in the twentieth century*. Westport, Connecticut: Greenwood Publishing.
- Mohawk, J. What we can learn about war and peace. <http://www.lapismagazine.org/what-can-we-learn-from-native-america-about-war-and-peace-by-john-mohawk/>
- Mokyr, J. (2001). *The rise and fall of the factory system: technology, firms, and households since the industrial revolution*. Retrieved from Carnegie-Rochester Conference Series on Public Policy 55(1) 47-54. <http://www.sciencedirect.com/science/article/pii/S0167223101000501#m4.1>

- Montessori, M. (1961). *The Montessori Method*. New York: Schocken Books.
- Montessori, M. (1995). *The absorbent mind*. New York: Henry Holt.
- Morrison, K. (2008). Educational philosophy and the challenge of complexity theory, *40*(1) 19-34.
- Morrison, M. L. (2003). The life of Elise Boulding. Paper Given at the Women War and Peace Conference Southern CT State University, New Haven, CT,
- National Council for Teacher Education-What is Peace Education? New Delhi <http://www.ncte-in.org/pub/unesco/ch1.htm>
- Nhat Hahn, T. (1998). *Interbeing: fourteen guidelines for engaged Buddhism*. Berkeley, CA: Parallax Press.
- O’Kane, M. (1991). Peace: The overwhelming task. *Veterans for Peace, Inc. Journal* 19 3.
- Orissa mathematical society. <http://www.omsonnet.com/main.php?item=8&slno=2>
- Osberg, D. & Biesta, G. (2007). Beyond presence: Epistemological and pedagogical implications of strong emergence. *Interchange*, 38(1) 31-51.
- Osberg, D., Doll Jr., W. E. & Trueit, D. (2009). Limiting Complexity. *Complicity: An International Journal of Complexity and Education* 6(2) ii-ix.
- Osher, D., Dwyer, K. & Jackson, S. (2004). *Safe, supportive, and successful schools: Step by step*. Longmont, CO: Sopris West.
- Paine, T. (1794). *The age of reason: Being an investigation of true and fabulous theology*. New York: G. B. Putnam and Sons.
- Palast, G. (2004). *The best democracy money can buy: An investigative reporter exposes the truth about globalization, corporate cons, and high-finance fraudsters*. New York: Plume.
- Parker, P. S., Ocegüera, E., Sanchez, Jr., (2010). Intersecting differences: Organizing (ourselves) for social justice work with people in vulnerable communities. In D. K. Mumby (Ed.) *Framing Difference*. Thousand Oaks, CA: Sage.
- Parton, N. (1996). *Social theory, social change and social work*. New York: Routledge.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage
- Peace arts international. <http://www.peaceart.org/>
- Petersen, A. D. C. (1960). *A hundred years of education*. London: Duckworth.

- Peterson, A. D. C. (1973). *Liberal education for all*. Liberal Party Press, London.
- Pilgrim, S. Smith, D. & Pretty, J. (2007). A cross-regional assessment of the factors affecting ecoliteracy: Implications for policy and practice. (DOI: 10.1890/06-1358.1)
- Pinnegar, S. & Daynes, J. (2007). My writing as inquiry. Locating narrative inquiry historically. In Clandinin, D. J. (Ed.) *Handbook of narrative inquiry: Mapping a methodology* (1-34). Thousand Oaks, CA: Sage.
- Polak F. (1972). *The Image of the Future*. San Francisco: Jossey Bass.
- Poplawski, T. (1998). *Eurythmy*. Spring Valley: Anthroposophic Press.
- Rabkin, N. & Redmond, R. (2004). *Putting the arts in the picture: Reframing education in the 21st century*. Chicago: Center for Arts Policy at Columbia College Chicago.
- Radford, M. (2008), Complexity and truth in educational research. *Educational Philosophy and Theory* 40 144-157
- Reardon, B. (1988). *Comprehensive peace education: Educating for global responsibility*. New York: Teachers College Press.
- Reardon B. (1993). *Women and peace: Feminist visions of global security*. Albany, NY: State University of New York Press.
- Roach, C. (1993). *Communication and Culture in War and Peace*. Newbury Park, CA: Sage Publications.
- Robinson, S. (2010). *Out of Our Minds*. Oxford: Capstone. TWO Hatano, G. & Inagaki, K. (1986). Two courses of expertise. In H. A. H. Stevenson & K. Hakuta (Eds.), *Child development and education in Japan*. New York: Freeman 262-272.
- Rousseau, J.-J. & Rousseau, E. (1979). *Émile: or, on education*. Trans. A. Bloom. New York: Basic Books.
- Rousseau, J.-J., On nature, wholeness and education The online encyclopedia of informal education <http://www.infed.org/thinkers/et-rous.htm>
- Rudolf Steiner College <http://www.steinercollege.org/index.html>
- Russell, J. (2007). *Chechnya—Russia's 'war on terror'*. London New York: Routledge.
- Sadgopal, A. (2005). *School, society, nation: Popular essays in education*. Hyderabad, India: Orient Longman.
- Sahasrabudhey, S. et al., (2006). *A dialogue on knowledge in society: A paper prepared for the world social forum*. Pandeypur, Varanasi: Satnam Printers.
- Sandy, L. R. & Perkins Jr., R. (2002). The nature of peace and its implications for peace

- education. *The Online Journal of Peace and Conflict Resolution* 4.
- Satya, L. D. (2002). Environmentalism: A global history (review). *Journal of World History* 13(2) 525-529.
- Sawyer, R. (2005). *Social emergence: Societies as complex systems*. Cambridge New York: Cambridge University Press.
- Schmidt, M. (2009). *Understanding Montessori: A guide for parents*. Indianapolis, IN: Dog Ear Publishing.
- Schwartz, D. L. Bransford, J. D. & Sears, D. (2005). *Efficiency and innovation in transfer; Transfer of learning from a modern multidisciplinary perspective*, (Ed.) J. Mestre, Greenwich, CT: Information Age Publishing, 1-51.
- Scott, D. (2003). *Curriculum studies: Curriculum forms*. Oxford, UK: Taylor & Francis.
- Scrutton, R. (1981). *A short history of modern philosophy*. London: Rutledge.
- Seltzer-Kelly, D. L., Cinnamon-Morrison, S., Cunningham, C. A., Gurland, S. T., Jones, K. & Toth, S. L. (2011). (Re)imagining teacher preparation for conjoint democratic inquiry in complex classroom ecologies. *Complicity* 8(1) 5-27.
- Sethi, A. & Kumar, S. S. (2005). *School, society, nation: Popular essays in education*. Hyderabad, India: Orient Longman.
- Sharma, V. (2002). *History of Jainism: with special reference to Mathura*. New Delhi: D. K. Printworld.
- Short, J. (2005). Proposals for the future development of peace education in Hiroshima City—Based on a comparative analysis of the peace education curricula of Hiroshima and Dresden. *Journal of International Development and Cooperation* 11(1) 85-103.
- Siemens, G. (2007). Connecting. *Complicity: An International Journal of Complexity and Education* 4(1) 108.
- Silverman, D. (1998) *Qualitative Research: Theory, Method and Practice*. London: Sage
- Sigler, J. (1997). *Education: Ends and means Vol 9*. Washington: University Press of America.
- Sinclair, M. (2004). Complexity theory and the mathematics lab-classroom. *Complicity: An International Journal of Complexity and Education* 1(1).
- Smith, L. (1999). *Decolonizing methodologies: Research and indigenous peoples*. London New York Dunedin, N. Z. New York: Zed Books University of Otago Press, Distributed in the USA by St. Martin's Press.
- St. Julien, J. (2005). *Chaos, Complexity, Curriculum and Culture* (eds.) W. Doll Jr., M. J.

- Fleener, D. Truit, J. St. Julien. Berlin, Germany: Peter Lang Publishing.
- Stanle, D. (2006). Complex responsive processes: An alternative interpretation of knowledge, knowing, and understanding complicity. *An International Journal of Complexity and Education* 6(1) 29-39.
- Steiner, R. (1911). *A psychology of body, soul & spirit: anthroposophy, psychosohy & pneumatosophy: Twelve lectures, Berlin, October 23-27, 1909, November 1-4, 1910, December 12-16*. Hudson, NY: Anthroposophic Press. xxvii.
- Steiner, R. (1921). *An introduction to Waldorf Education, collected edition of Rudolf Steiner's works*. Aufsätze Über die Dreigleiderung der sozialen organismus und zur Zeitlage (Vol. 24 in the Bibliographic Survey, 1961). Translated from the German by E. Bowen-Wedgewood; translation revised by Frederick Amrine. Retrieved from <http://www.southerncrossreview.org/32/steiner.htm>
- Steiner, R. (1996a). *Colour: three lectures given in Dornach 6th to the 8th of May, 1921 together with nine supplementary lectures given on various occasions*. London: Rudolf Steiner Press.
- Steiner, R. (1996b). *Rudolf Steiner in the Waldorf School: Lectures and addresses given to children, parents, and teachers, 1919-1924*. Hudson, NY: Anthroposophic Press.
- Sterling, S. (2003). Whole systems thinking as a basis for paradigm change in education: explorations in the context of sustainability (PhD thesis). Center for Research in Education and the Environment, University of Bath. www.bath.ac.uk/cree/sterling.htm
- Stomfay-Stitz, A. M. (2008). A history of peace education in the United States of America. *Encyclopedia of Peace Education*, Teachers College, Columbia University, www.tc.edu/centers/epe
- Synott, J. (2005). Peace education as an educational paradigm: review of changing field using an old measure. *Journal of Peace Education* 2(2).
- Taos Waldorf School in the US: http://taoscountrydayschool.com/index.php?option=com_content&view=article&id=19:taos-country-day-school-a-waldorf-inspired-school-in-taos&catid=1:taos-school&Itemid=2
- 'The butterfly effect' (2004). New Line Cinemas.
- The edible schoolyard. <http://www.edibleschoolyard.org/history>
- The gathering for justice. <http://gatheringforjustice.ning.com/>
- The integral activism working group. <http://www.salon.c-integral.com/>
- The international Montessori index. <http://www.montessori.edu/FAQ.html#QUESTIONS>

- The peace boat. <http://www.peaceboat.org/english/index.html>
- The Vancouver Waldorf School in Canada: Outdoor education program. http://www.vws.ca/curriculum/c_highOutdoor.html
- Timmons, G. (1988). *Education, industrialization, and selection*. New York: Routledge.
- Trahar, S. (2009). Beyond the story itself: Narrative inquiry and autoethnography in intercultural research in higher education. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* 10(1).
- Uller, A. A. (1992). Toward an emancipatory methodology for peacy research. *Peace & Change* 17 286-311. DOI: 10.1111/j.1468-0130.1992.tb00586.x
- Urry, J. (2005a). The complexities of the global theory. *Culture & Society* 22(5) 235-254.
- Urry, J. (2005b). The complexity turn theory. *Culture & Society* 22 1-14.
- Urry, J. (2003). *Global complexity*. Malden, MA: Polity.
- Vertuno, J. Texas Poised To Pass Bill Allowing Guns On Campus http://www.huffingtonpost.com/2011/02/20/texas-guns-campus-colleges_n_825718.html
- Vidyapeeth, S. (2006). *General Graduate Course Reader*. Vidya Ashram, Sarnath, India
- Waldrop, M. (1992). *Complexity: the emerging science at the edge of order and chaos*. New York: Simon & Schuster.
- Wallenstein, I. (1996). *Open the social sciences: Report of the gulbenkian commission on the restructuring of the social sciences*. Stanford: Stanford University Press.
- Walford, G. (2001). *Doing qualitative educational research: A personal guide to the research process*. New York London: Continuum.
- Wallerstein, N., Duran, B. (2003). The conceptual, historical and practical roots of community-based participatory research and related participatory traditions. In Minkler, M., Wallerstein, N, (Eds.) *Community-Based Participatory Research*. San Francisco: Jossey Bass.
- Webel, C. & Galtung, J. (2007). *Handbook of peace and conflict studies*. London New York: Routledge.
- Weiler, K. (1988). *Women teaching for change: Gender, class and power*. South Hadley, MA: Bergin and Garvey.
- What is peace education? National Council for Teacher Education-What is Peace Education? New Delhi. <http://www.ncte-in.org/pub/unesco/ch1.htm>
- Woehrle, L. M. (1995). Teaching about women from a peace studies perspective: An annotated

bibliography of resources on conflict, peace, and justice. *Women's Studies Quarterly* 23(3/4) 214-248

Weiler, K. (1988). *Women teaching for change: Gender, class and power*. South Hadley, MA: Bergin & Garvey

Woods, P., Ashley, M. & Woods, G. (2005). *Research report*. Steiner Schools in England, University of West of England, Bristol: Research Report RR645.

Worthington, V. (1989). *A history of yoga*. London New York: Arkana.

Zinn, H. (2003). *A people's history of the United States, 1492-present*. New York: Perennial Classics.