Chapter 6
Beyond the Surface: The Deeper Challenge in Environmental Education—Transforming Consciousness Through Peace Environmental Education

B. Jeannie Lum

Abstract The growth of the ecology of environmental learning research programme continues to increase as research evolves in understanding how garden-based programmes can be effective in spreading awareness of the sustainability crisis. This chapter challenges the prevailing traditional approach to environmental education by proposing that the current 21st century crisis requires the infusion of a peace ecological orientation to environmental learning in order to realize sustainable transformation and a sustainable peace through education. Preliminary results of a university peace environmental course in achieving the deeper challenge of transforming human consciousness as a precondition to existential changes in lifestyle habits are reported. Narrative accounts show different types of transformation are possible in assessing the effectiveness of combining peace and environmental education as a viable critical approach for learning environmental stewardship. This chapter introduces the concept of *emergent biophilia* as a higher-order integral state of consciousness when learning is approached as a transdisciplinary process of integrating nested ecologies of environmental knowledge, participation, cultural experience, and peace values in course construction.

Keywords Consciousness · Emergent biophilia · Human development · Nested ecologies · Peace · Stewardship · Transformation

6.1 Introduction

The growth of the ecology of environmental learning field continues to expand as a cross section of individuals and groups within academia, government, businesses and non-profit organizations engage in educational programmes aimed at

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Ú. Oswald Spring et al. (eds.), *Expanding Peace Ecology: Peace, Security, Sustainability, Equity and Gender*, SpringerBriefs in Environment, Security, Development and Peace 12, DOI: 10.1007/978-3-319-00729-8_6,

spreading awareness of the sustainability crisis and changes needed for human survival in the 21st century.[1] In the United States, the National Environmental Protection Agency's (EPA) Office of Children's Heath Protection and Environmental Education mandate to bring about public awareness 'to know s*omething* (emphasis added) about the environment issues in their communities, nationally and globally' has not led to desired outcomes with more than 100 million federally invested funds in education projects, undergraduate and graduate student fellowships, state certification programmes, the creation and dissemination of *environmental education* (EE) standards for teaching materials in formal and non-formal programmes, a national educator training programme, research and evaluation (Wray-Lake et al. 2008). 'The message of personal responsibility, involvement and action, exhibiting stewardship behaviors, and ownership of the major sources of pollution (nonpoint source) in this country today has not been widely received and understood' (Potter 2010: 25).

The perplexing problem for educators is not just how to educate for environmental awareness but also what materials to use that will reorient or transform students and public perceptions and their lifestyle habits in becoming stewards of the earth. The definition of EE that was developed by EPA in 1992 is:

> Increasing public awareness and knowledge about environmental issues and providing the skills necessary to make informed environmental decisions and to take responsible actions. It is based on objective and scientifically sound information. It does not advocate a particular viewpoint or a course of action. It teaches individuals how to weigh various sides of an issue through critical thinking and it enhances their own problem-solving and decision making skills (EPA 1992: 2).

The evolution of the ecology field since Haeckel coined the term in 1966 (see Chap. 1) has resulted in a collection of sub-disciplines that focus on scientific research on the behaviour and adaptation of human populations, conservation of ecosystems, and the functional relationship between human organisms and other biological living systems. However, with the 21st century environmental crisis, the contemporary sustainability ethos round the globe necessitates fundamental changes in human lifestyles, the realization of a planetary consciousness, and the engendering of a new ethic of care for all human life and our natural resources

[1] The *2010 State of the World Report* from The Worldwatch Institute documented staggering figures tracking environmental changes over half a century. Environmental degradation stood as the highest priority of world problems that severely impacts the survival of the human race (Assadourian 2010). An UN report of 7 June 2012 on the environment emphatically warns that the earth's physical boundaries critical to human survival 'are being pushed towards their biophysical limits… As human pressures on the earth … accelerate, several critical global, regional and local thresholds are close or have been exceeded … Once these have been passed, abrupt and possibly irreversible changes to the life-support functions of the planet are likely to occur, with significant adverse implications for human well-being' ("UN warns environment is at tipping point," in: *USA Today*, 6 June 2012: 1).

makes the task of course creation evermore complex.[2] 'Environmental ecology' goes beyond the lifesystems in the biosphere to 'social ecology' (Brookchin 2005).

> Social ecology is based on the conviction that nearly all of our present ecological problems originate in deep-seated social problems. It follows, from this view, that these ecological problems cannot be understood, let alone solved, without a careful understanding of our existing society and the irrationalities that dominate it. To make this point more concrete: economic, ethnic, cultural, and gender conflicts, among many others, lie at the core of the most serious ecological dislocations we face today—apart, to be sure, from those that are produced by natural catastrophes (Bookchin 2007: 19).

6.2 Environmental Education in the United States

In the United States, environmental education has been slow to accommodate real world changes. Yet, elementary schools and middle and high school science courses that integrate outdoor activities in garden based learning is receiving national attention.[3] Today, the interest in school gardens comprises a cross section of individuals and groups within academia, government, businesses and non-profit organizations often soliciting grants geared towards health and nutrition. Leading the way, the First Lady, Michelle Obama, continues her initiatives to fight child obesity and improve nutrition in schools with programmes like *Let's Move*, the *White House Kitchen Garden*, the *Healthy, Hunger-Free Kids Act* of 2010. Famous chefs have initiated cooking classes in schools that educate children to develop good eating habits by learning how to produce, appreciate, and cook healthy meals that come fresh from the garden.[4] Famous entertainers have performed free and dedicated their concerts to raise funds for school based gardening

[2] In 1992, the Union of Concerned Scientists issued this warning: 'Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our recent course will bring about' (http://www.un.org/popin/icpd/conference/ngo/940909224555.html).

[3] The U.S. Department of education, the National Science Foundation and other partnership agencies offer the Science Technology, Engineering, and Mathematics (STEM) Education Coalition grants in which gardening programs may find funding if they combine science education with gardening practices. STEM initiatives in funding is a result of the U.S. falling in world-wide status in students who graduate in these fields.

[4] A U.S. national example is Chef Alice Waters owner of Chez Panisse Restaurant in Berkeley California. Waters pioneered the Edible Schoolyard program that introduces students into all aspects of locally grown organic gardening in the public schools where they grow, prepare, cook and share food. A local icon, Chef Alan Wong, is considered the Godfather of Hawaiian Cuisine and engages in local fundraisers for charity organizations and supporter of the Kapiolani Community College Culinary Arts Program of which he is a graduate.

programmes.[5] In 2009 the Centers for Disease Control and Prevention identified farm-to-school programmes as an effective vehicle for improving the quality of student meals and enhancing nutrition education (Wood 2011).[6] Though not fully implemented to this day, in 1995, California's State School Superintendent Delanie Eastin mandated 'a garden in every school.' Yet, as prolific as these non-profit and federal and state partnership programmes may be to educate public and private school teachers for developing school gardens, there is a gap among those who are well versed in agricultural knowledge and gardening practices, others who know only how to teach their specialized knowledge in the sciences and many who outside of the science field see the need to address the current crisis but do not know how to integrate 'environmentalism' into their subject matter (e.g. math, social studies, languages, literature, etc., Guns 2006).[7] Nation-wide, at the university level, within the broad mission of sustainability, we find courses cropping up everywhere throughout the natural, social science disciplines and professional schools with agricultural reformists, environmentalists, and educators wanting to bridge the gap between environmental, social, and adaptive learning pedagogies from the sciences (e.g. natural resources management, resilience perspectives in social-ecological systems, civic ecology and adaptive co-management strategies) with current educational learning pedagogies found in colleges of education that promote social interaction, situated learning, authentic, experiential, place-based, inquiry-based, and project-based environmental practices (Krasny et al. 2009; Krasny and Tidball 2009; Tidball and Krasny 2011). The problems in educating for an ecological consciousness become even more complicated when acknowledging that the topics and approaches in teaching environmental ecology courses cannot avoid the integration of perspectives from multiple disciplines. Teachers must also accept that they need to constantly update and remake their core curriculum in a period where there are fundamental paradigm shifts in the discovery of new knowledge and the emergence of new unforeseen problems. The need to accommodate mixed grade levels, the linking of theories taught in-class to outdoor natural settings, and the reorientation of local, sometimes provincial) place-based schooling to global concerns add to the challenges in teaching this type of course.

In this chapter, the piloting of an peace environmental education course at the University of Hawai'i and post-graduation survey results are presented that investigate the following questions: The primary research question is: Can an

[5] Hawai'i local and world renown musician, Jack Johnson and his wife founded the non-profit Kokua Hawai'i Foundation supports educational grants and programs in environmental education for Hawai'i schools. Johnson hosts an annual Kokua Festival as the major fundraiser event that brings together environmental organizations, eco-friendly businesses, musicians, artists, teachers, and community leaders to support environmental education in Hawai'i.

[6] Wood, R.J., Farm to School and the Child Nutrition Act Improving School Meals Through Advocating Federal Support For Farm-To-School Program. Robert Wood Johnson Foundation, Published: 05/31/2011 http://www.rwjf.org/en/research-publications/find-rwjf-research/2011/05/farm-to-school-and-the-child-nutrition-act.html.

[7] Farm to School Meeting, The Kohala Project, Hawaii Island, report, 22 February12.

environmental education course taught from a peace education perspective transform human consciousness and succeed in creating persons who become stewards of the earth? Secondary research questions entail: What is the working definition or characterization of peace consciousness? What kind of content, design, or pedagogical teaching methods would be used in an environmental education course that might achieve these results? What research methods are appropriate for researching post-graduation learning linked to programme and course evaluations? What are the criteria or qualifications that determine different aspects or levels of transformation in human consciousness?

Research results of a survey taken by graduates 2 years following their enrollment in an experimental peace environmental education course with a general focus on educating for the cultivation of peace gardens is a viable approach to creating an integrated ''peace environmental consciousness' in students, youth, and adults that serves the broader mission of environmental sustainability.

6.3 Conceptual Framework

6.3.1 Historical Context of Peace Education Linked to Environmental Ecology in the 1990s

A world-wide movement began in 1989 at the International Congress on *Peace in the Minds of Men* in Yamoussoukro, Cote d'Ivoire, called UNESCO's 'Culture of Peace Programme' (UNGA 1998). Following the end of the Cold War, a series of meetings was called about the mission of the United Nations that questioned the need for organizational change, improved communications among its various departments, and more effective handling of operations abroad given changes in the global landscape. The UN began to scale down and encourage more comprehensive action for the new millennium, particularly emphasizing the important role of education (UNESCO 1997). An example was the redefinition of the traditional UN forces peace*keeping* mission to peace *building* as an intervention strategy providing aid to war-torn societies. The redirection of its military defense efforts allowed more *engagement* in the processes of creative renewal and the reconstruction of *cultures of peace* in countries affected by war. Just as the Union of Concerned Scientists had stressed the need for a *new ethic,* UN members agreed that fundamental to the success of the cultures of peace endeavor required the greater challenge—the change of 'the hearts and minds of men' who were steeped in civilizations whose ideological perspectives and cultural ways of life not only justified war and violence as strategies for achieving peace but also the economic means and social cultural supporting ideologies and lifestyle habits. The carelessness of corporate profit minded *laissez-faire* destruction of natural resources encouraged a wasteful materialistic consumptive lifestyle that symbolized aspects of a *culture of war* mentality that had to change. Peace education was looked upon

to meet the forthcoming millennium goal of ecological sustainability by *transforming human consciousness* in ways of thinking and habits of being that would lead to real changes in *being* and *lifestyle habits*.

Among educators, there is often a lot of confusion about the meaning and applications of studies and research in peace education; even more so with this recent expansion of the field from a political centre to encompass social, cultural, ecological, and environmental concerns. Barriers to overcoming public perceptions about the field of peace education are buried in the history of the establishment of the field of peace studies. Peace education was academically recognized as a subfield of the social sciences generally referring to programmes in peace studies that emerged in political sciences, sociology, and future studies departments. These were not at all associated or linked to Colleges of Education and teacher education programmes. With the creation of the UNESCO 'Culture of Peace Programme', the operative definition of 'peace' was transfigured beyond the traditional *negative peace* and *positive peace* formulations that had dominated the field of peace studies for several decades (Galtung 1969a; 1967b, Chap. 1). In seeing peace education as a vehicle for transforming cultures, this did not eliminate the important need to recognize explicit and implicit forms of violence and their elimination as an essential step in achieving peace; but, by taking the emphasis off contexts of violence as a precondition for peace action, this made peace a valued educational end in itself. What *end states of being* belong to the family of experiences connected to *peace?* How are these achieved through education? This changed the educational landscape for peace educators to reach outside contexts of violence and confines of conflict resolution or war in studying and researching pedagogies of peace. Thus, peace gardens, their function and educational possibilities, evolved with the environmental education movement of the 1990s and push for sustainability.

Peace gardens have popularly been directly or indirectly thought about in relation to wartime events. At the suggestion of creating peace gardens in schools, teachers and legislatures look bewildered. They often think of peace gardens created to honor and memorialize fallen victims and heroes of war. Yet, another association of peace gardens in American history was during World War I and II when the U.S. government supported the local development of victory gardens nation-wide. These were created to help supplement dwindling food supplies and it has been estimated that over 20 million backyard and school gardens were in operation. Public perceptions are also politically linked to the student led forums, protests, and marches of the 1960s on university campuses (Stomfay-Stitz 2000). These cultural connotations carry over in first level impressions and blur the connections of peace gardens to the current 21st century sustainability environmental movement (Lum, in press).

6.3.2 Peace Consciousness

'Peace consciousness' defined in the context of gardening involves the cultivation of five human capacities and guiding intentions: (1) learning how to find and experience peace within oneself; (2) learning how to manage peaceful relations with others and relations to all living creatures in ways that are harmless and mutually beneficial; (3) learning how to live with and within one's natural and manmade environment and the planet earth that sustains an ecological balance; (4) learning how to experience ones identity radically interconnected (Selby 2002) within a global community engendering global responsibility; and (5) achieving a universal spiritual cosmic awareness. Other peace educators (Sauvé and Orellana 2004; Brenes-Castro 2004; Reardon 1989) have developed frameworks spanning three similar areas beginning with a core self and inner peace, peace with others, and peace with nature. Here, I expand on two additional dimensions. A fourth dimension of global identity proposes that education about peace must link local life experiences of individuals as universal members of humanity. A fifth dimension of spiritual cosmic awareness proposes that we must understand the interrelatedness of human activity with other life systems on earth and planetary changes in the solar system.

The term 'peace consciousness' conceptually is also aligned with the integrated consciousness of four ecologies of identity in Wimberly's theory of *nested ecologies.* Wimberly (2009) sees the environment represented in a hierarchy of nested ecologies—the personal, socio-cultural, environmental and cosmic ecologies. Hierarchy is not defined in the sense of top down or bottom up structured relationships, but rather draws from Maslow's human developmental model indicating prioritized levels of need that define the optimal functioning in being human. These four primary forms of ecology are interdependent—the personal focuses on an ecology of the self identity; the socio-cultural is family and community oriented; the environmental reflects the natural ecosystems; and the cosmic relates to the unknown, the transcendent and energies in the universal of which all planetary life depends. Wimberly sees the functioning of each domain interconnected and interdependent in its support of individuals and subsystems of healthy sustainable communities:

> Healthy and sustainable communities are constantly conserving and improving natural environments, continually creating and improving built and social environments, and expanding those community resources required to insure that current and future residents will be able to perpetually extend mutual support to one another and realize their maximum potential in performing all the functions of life (Wimberly and Haught 2009: 122).
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> An ecosystem that persists over time; remains productive; exhibits biodiversity, resilience, and adaptivity to change; and that can be expected to continue doing so into the foreseeable future (Wimberly and Haught 2009: 128).

6.3.3 *Emergent Biophilia: The Biophilia Hypothesis and Intentionality*

Cultivating a peace consciousness takes ecology to a higher-level consciousness of intentionality (Searle 1969; Lum 2008) in meaning and sense-making beyond the physical, functional and social interactionist frameworks, nevertheless, taking these into account. Peace consciousness in this sense is an *emergent intentional integral state of being* that merges the four nested ecologies identified above. Here the concept of 'emergent biophilia' (Burgess and Mayer-Smith 2011) is expanded in contrast to Tidball's notion expanding upon, yet in contrast to Tidball's notion of *urgent biophilia.* The *biophilia hypothesis* first proposed by E.O. Wilson is defined as "the innately emotional affiliation of human beings to other living organisms" (Wilson 1984: 31). Tidball (2012) "suggests that when humans, faced with a disaster, as individuals and as communities and populations, seek engagement with nature to further their efforts to summon and demonstrate resilience in the face of a crisis," they exemplify urgent biophilia. The conditions to which individuals respond require a sense of urgency in their need for survival. This supports the naturalistic premises put forth by Wilson that biophilia is a genetic biological trait inherent in human beings and their evolutionary development. Biophilia is found in its positive and negative (biophobia) human expression at every level of linguistic, social, and cultural representation, e.g. in human affiliation with fauna and flora (Shepard 1993), linguistic idioms, similie, and metaphors, and generated meanings symbolic in culture and the arts (Lawrence 1993). There are different opposing positions (Diamond 1993), if not questioning the limitations it imposes (Orr 1993; Wimberly 2009); notwithstanding, the importance of its innate implications for educators is vitally relevant to the instructional practices used in learning situations. Of particular significance, is Wilson's further claim that biophilia is "mediated by rules of prepared and counterprepared learning—the tendency to learn or resist learning certain responses as opposed to others….not a single instinct but a complex of learning rules that can be teased apart and analyzed individually" (Wilson 1984: 33). The important question, as seen above, thus, not only has to do with how to educate for ecological consciousness, but furthermore, whether the evolution of the modern age of materialism, technology, consumption and concrete metropolitan and urban jungles have been powerful enough to diminish or even completely erase this trait.

Ulrich (1993) surveys the empirical evidence on *biologically prepared learning* and categorizes three areas of research: positive and negative responses; restorative or stress recovery responses; and enhanced higher order cognitive functioning. The first researches human biological responses to natural stimuli (e.g., pictures of natural landscapes, snakes and spiders). The second functional-evolutionary perspective approach identifies conditions of health and well-being (e.g., recharging of energy or adaptive behaviour to demanding situations; stress or anxiety reduction to viewing nature or outdoor recreational experiences). The third cognitive approach looks at human engagement in non-urgent tasks in natural settings measuring higher-order

thinking, creativity, (e.g., preserving nature for workplace productivity). The fundamental premise underlying this research programme is that there are essential experiences for human survival that may recover the desire, and hence, motivate us toward action in the preservation/conservation of the natural environment.

'Emergent biophilia' suggested here, takes a neutral and indifferent position to the genetic perspective. That is, it does not hold that we have biophilia genes of which some humans may be more predisposed to adaptive biologically prepared learning rules than others. Nor does it hold that the rationale for engaging in environmentalism is based on a fundamental biological need for survival. Rather, it holds that human engagement with nature spans a repertoire of cultural needs in indeterminable meaningful ways that potentially trump utilitarian based physical needs. Thus, any educational approach wishing to enlist a transformation of human attitudes and behaviours requires an *educative cultivation* of knowledge and sensibilities through the integration of cognitive, moral, psychological, emotional, aesthetic, and physical experiences. Emergent biophilia, as the term is used, might be seen under this third approach, in that the condition of non-urgency is implied; however, it expands beyond the functional-evolutionary paradigm to embrace post-modern cultural perspectives, studies in consciousness and intentionality (Searle 1969) and critical reflection (Mezirow 1991) in its framework of analysis.

'Emergent' refers to a transformed state of human consciousness that emerges as a consequence of the integration of a collection of elements that require a reflective and critical stance to the invisible elements compounded in its new configuration. In the debate about the nature of consciousness, philosopher John Searle describes this phenomenon using the liquidity of water as an example:

> Consciousness is a higher-level or emergent property of the brain in the utterly harmless sense of 'higher-level' or 'emergent' in which solidity is a higher-level emergent property of H_2O molecules when they are in a lattice structure (ice), and liquidity is similarly a higher-level emergent property of H_2O molecules when they are, roughly speaking, rolling around on each other (water). Consciousness is a mental, and therefore physical, property of the brain in the sense in which liquidity is a property of systems of molecules (Searle 1992: 14).

Thus, an emergent property manifests itself in form and function whereby its trace elements are indistinguishable. Human beings do not experience the elemental properties or interactions of H_2O in liquidity in their conscious awareness. We must be educated and discover or learn about them under their nascent conditions. Secondly, just as the form and functions of water in its transformed liquid state is realized within a conscious network of intentional states—a multitude of beliefs, practices, and cultural associations—so do our conscious intentional states exist in a transformed state that transcends the unconscious limitations of its prior elements and conditions (Searle 1992). That said, the reduction of cultural values is counterintuitive to the generative forces needed in the creation of cultures of peace that can overcome the pitfalls of modernity. Rather, emergent biophilia requires a wholistic peace environmental approach whereby the transformation of human consciousness into a peace ecological consciousness may be linked to human biology (bio-cultural theory) but without some form of education and

engaged meaningful practice, it is unlikely that action derived from instinct alone would achieve the transformation to a 'peace consciousness' so desired.

6.3.4 Methodological Framework

The methodological framework to assess the respondents' critical and perspective states of transformation is adopted from Mezirow's (1991) levels of assessment in critical reflection. Mezirow dissects different aspects of learning and reflective processes that affect transformation of a person's perspective and action. Type 1, *instrumental reflection* involves a "process of learning to control and manipulate the environment or other people" (Mezirow 1991: 8). It does not require any change in one's assumptions or beliefs, rather judgment and problem solving is based on prior perspectives that one already has when entering the course. Change of views or habits is still possible, but oriented toward self-validation or confirmation of a set of beliefs and values that are a priori in place. Change may occur through adoption of new ideas or practices based on preexisting meaning structures and perspective principles. Type 2, *communicative reflection* and learning "focuses on achieving coherence" understanding meaning and making sense of new information. The adoption of new ideas is a result of questioning substantive existing beliefs. Change occurs in the process of reasoning about a corpus of beliefs and replacing or adding new ideas in the process of reconstruction. Type 3, *perspective transformation*, a higher order capacity in reflection and learning reflects what might be consider the ultimate level in achieving a 'peace consciousness' that entails environmental awareness, ecological sensitivity that leads to fundamental changes in one's behavior, perceptions and lifestyle habits. *Critical reflection* "challenges the validity of *presuppositions* in prior learning (Mezirow 1991: 12) or basic premises in our assumptive beliefs. The process of transformation takes into account our taken-for-granted beliefs, habits, ways of thinking and being in undergoing substantial transformation towards the development of new ways of experiencing and being in the world. "Critical reflection is not concerned with the how or the how-to of action but with the why, the reasons for and consequences of what we do" (Mezirow 1991: 13).

> Perspective transformation is a process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world; of reformulating these assumptions to permit a more inclusive, discriminating, permeable, and integrative perspective; and of making decisions or otherwise acting upon these new understandings (Mezirow 1991: 14).

Below in the discussion of results, examples of three student cases are provided that illustrate these degrees of transformation from *instrumental* = pragmatic; *communicative* = substantial; and *perspective* = critical. Intentionally these levels are not structured from low to high because the analysis of consciousness is considered intertwined, much like the way in which Wimberly's ecologies are nested.

In this sense, states of transformation are nested *identity* states, in five dimensions: identity with self, with others, with the environment, the global and cosmological.

6.4 The Peace Environmental Education Course

The 'Peace Environmental Education' course was originally introduced as an experimental course in the College of Education at the University of Hawai'i designed to create awareness in education majors about the environmental crisis with a focused activity centered around the concept of peace gardens. Its goal was to have students (principals, teachers, graduate education majors) incorporate environmental issues in their teaching Kindergarten-12th grade curriculum or in their future professional career. The paradigm shift in the field of peace education steered by the 'culture of peace' movement was a clear match with environmental education and the budding interest in sustainability at the university level in 2006. However, the political reality was that 'peace education' as a name for a course continues to appear vague in colleges of education. The name 'environmental education' was used because it was already listed on the department's roster, but not taught since the 1970s.

How does the content of this peace environmental education course likely differ from what is more commonly perceived as a typical environmental education course? What does a peace perspective bring to the course that, in this case, enhances the chances of transforming student consciousness towards becoming stewards of the earth in ways where more traditional approaches have failed? In late 19th century America, with the advent of modern industrialization and the building of the railroad, the environmental movement evolved from a conservationist orientation to protect the pristine beauty of natural landscapes, parks, and designated lands from destruction for the leisurely enjoyment of the wealthy. By the mid 20th century, environmentalist, peace activists and educators sought to preserve the environment and protect human life from the pollution brought on through industrial pollution and nuclear warfare. Rachel Carlson's (1962) famous book, *Silent Spring*, raised awareness of the use of DDT and its impact in altering human and environmental life systems. The traditional approach to environmental education questions the impact of human actions on the environment and the capacity of the earth to naturally replenish itself, hence assuming natural resources can sustain human life *ad infinitum*. It defines and sees problems from the perspective of the natural sciences, and as mentioned above, sees environmental education appropriately taught in natural and biological science classes. The extension to gardening as a site for outdoor experimentation frequently translates human ecology to issues about human health and nutritional wellness. It is a functional relationship that assesses the value and consequences of human actions (more often industry driven by economic values) taken on an objective natural world of which humans depend for their survival. The two, humanity and natural environment, are seen as *naturally* interdependent.

Today's 21st century challenges to this long established tradition sees environmental education with a broader and deeper multidimensional lense that necessitates the integration of transdisciplinary perspectives and approaches in education. In 1992, the *Union of Concern Scientists* (UCS) issued a statement warning:

> Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our recent course will bring about.[8]

The peace environmental course adopts a critical perspective on the tradition of the environmental movement as well as Western dominated traditional pedagogies and practices in education. It's historical framework for examining cultural assumptions about human ecology and the environment are drawn from Edmund O'Sullivan's (1999) transformative learning perspective and transformative learning practices (O'Sullivan and Taylor 2004). Additional transdisciplinary strategies and values are adapted from the UNESCO *Culture of Peace Programme* (CPP) recognizing the need to bridge theory with practice, indoor with outdoor classroom learning, understanding of diverse cultures and acknowledging the impact of cultural values as a vital aspect of the learning process. In particular, the hidden assumptions underlying the dominant ethic of materialism, consumption, profit-mindedness that sees humans as a superior species needing to control, dominant, and use the earth's natural resources purely for its own advantage must be supplanted with universal values of peace, social justice, and environmental sustainability that could benefit all and not just the privileged few (International Decade for a Culture of Peace, U.N. General Assembly A/RES/53/25). The unconventional nature of the peace environmental course is that it infuses universal peace values in the education and practices of gardening and tending to the environment. The revitalization of the concept behind peace gardens is based on a historical account of the value that gardening has had in the survival of humanity and flourishing of human civilizations. It includes a comprehensive vision for peace in schooling for the 21st century (Lum in press) guided by five principles woven in to school culture, curriculum integration, pedagogy, and educational practice is all areas of schooling: (1) Peace within, (2) Peace in relations with others and all life systems, (3) Peace with the natural and fabricated environment, (4) Peace as an interconnected part of the global community and; (5) Peace in spiritual awareness of one's place in the cosmos. An eclectic pedagogical approach supports the use of a variety of instructional strategies that is determined by the appropriateness for a given learning situation, the cultural context, the learning aims, the available resources, and the capacity of the learner. In this course service

[8] See footnote 2.

learning (Kaye 2010) is essential in providing a community project where students can focus their creative energies and engage in experiential learning.

What follows is the identification of some of the more salient elements of these pedagogies, their translation into the peace environmental education course content, assignments, and instructional strategies (UNGA 1999).

6.4.1 Education for All and Everywhere

Essential to the programme is *Education for all*—an intergenerational CPP mandate that education extends beyond formal institutions through all walks of life, beyond children to all ages, beyond local and national boundaries to a global world community, beyond cultural limitations to figuring out communicative strategies that can make everyone a participant in creating cultures of peace on a universal scale.

> By focusing on our children, we implicitly pledge ourselves to *education for all*, a concept that combines formal and non-formal education and seeks to promote quality basic education that is grounded upon the universal values—and practice—of a culture of peace and non-violence. Such a task must engage every one of our fellow citizens in all dimensions of life: in schools, workplaces, and the home; at the national and at the community levels; in the public, private and voluntary sectors. Above all, children themselves must be empowered to become actors, not mere spectators, in shaping their own visions and futures…. (Mainstreaming 2002).

The course was open to any graduate student or upper division undergraduate, from any major area of study, to any age, gender, and ethnicity. It is also open to any public citizen as an unclassified university enrolled student.

The course was held inside the classroom at the University of Hawai'i and outdoors at several sites around the island of Oahu with one excursion to the island of Kaua'i, field trips to four Hawaiian sacred sites, two Hawaiian Heritage sites, the beach, the University Lab School, the University College of Tropical Agricultural and Human Resources Urban Garden Center Master Gardener Program, and attendance of a series of four films and talks by the nationally award winning non-profit organization Beach Environmental Awareness Campaign Hawai'i (B.E.A.C.H.).

6.4.2 Transdisciplinarity

Peace education is a transdisciplinary discipline that recognizes the tradition and historical evolution from mono-disciplinary to cross-disciplinary, multi-disciplinary, and interdisciplinary approaches in academic studies and research. It honours the inclusiveness of all of these approaches in understanding the problems and steps for transforming cultures. Cultural transformation places the responsibility and control for change in the hands of those affected by change, empowering the people 'on the ground' whose livelihood is at stake and who *know* the

meanings and hidden implications of actions less apparent to distant consultants or nonlocal residents. Integration of theory-practice-application-ethics is practiced at each step of the process through dialogue leading to socially just and fair outcomes for all. Transdisciplinarity enables a new vision for establishing a culture of peace based on the universal values of "respect for life, liberty, justice, solidarity, tolerance, human rights and equality between men and women" (Mainstreaming 2002: 2). *Transforming* cultures is not returning to where one was before, blindly accepting conditions due to personal familiarity or comfort zones that resist change, least the same problems will reoccur again. New visions that overcome unhealthy, repressive, discriminatory, unfair, unequal human conditions require fresh ideas, making interconnections, and allowing the *never before heard of* and *never before seen* be taken as legitimate possibilities.

The peace environmental education course taps different disciplinary perspectives on environmental issues in course content to develop a transdisciplinary mindfulness in critical thinking, problem posing, and envisioning new ways of looking at problems. *In-class*: students and the teacher are treated with equal respect that represents diverse interests and disciplinary backgrounds (in this class, art education, urban development, English, social studies). Students are given a teaching role in leading class discussions for readings, reporting on the progress of their projects for shared feedback, and conducting a final presentation of their project. One of the course assignments is a service learning project that includes research and volunteer work for an NGO or environmental community organization that centres on environmental restoration activities, education of the public, and political action in support of an environmental issue in the local community. Representatives of these NGO's adopt team teaching strategies. For example, the head of the *Beach Environmental Awareness Campaign Hawaii* (B.E.A.C.H.) spoke in a month long series that included films that were open to the public (arranged by the instructor). Two guest scholar/researchers, one from environmental studies and another who developed global education curriculum were invited to speak about their research. Class *conversations* were open and lively.

Other cultural perspectives were presented about the environment in outdoor classes. In this case, a grant was received for outings managed by an eco-tour company to visit Hawaiian sacred sites around the island of Oahu. The eco-tour guides were the teacher experts because they had knowledge of the historical events, persons, significance of the cultural meanings and symbolism surrounding the declaration of these landmarks unfamiliar to the instructor. The instructor was equally a learner who could adapt this information to later course offerings. For example, in-class presentations on the research and theoretical perspectives about the impact of global warming and natural resource management on the individuals and society becomes *real* to students when the class follows with a trip to the seashore, participates in beach cleanup, sees the degradation of the coral reef and marine life and then talks to local fisherman about the consequential loss of the means of their livelihood. Noticing that the price of sashimi rises, a traditional staple for island family celebrations and holidays and is disappearing from the dinner table alerts one to the global crises. Learning to sort the debris or Coca-Cola

bottle caps written in an undecipherable foreign language filling the stomachs of dead seagulls tells stories that leave an impression more impactful than theory alone can do.

6.4.3 Building Trust, Empathy, Respect and Understanding Among Differences and Cultures

Peace education aims to build "trust and understanding among and between different cultures and civilizations, as well as nations, communities and individuals" (Mainstreaming 2002: 4). An example, is the visit to the sacred site of the Kukaniloko Birthing Stones, where only high ranking Hawaiian ali'i (royalty) came to give birth to their sons and daughters witnessed only by other island tribal chiefs. Seeing how the shapes of stones had worn away since the first birth in 1,100 AD indicated the location and positioning of women in birthing. In the far distance is a view of the mountain range that depicts the shape of a woman in a reposed position, a story known only by *kamaina* (locals). Knowledge about what this area was envisioned to have looked like in the past, unlike the dry unfertile, barren, red clay soil that it is now, surrounded by abandoned pineapple fields, enlarged students' sensitivity to the life giving spiritual relationship between humans, the rocks and the land. Such experiences helped raise awareness of how the indigenous Hawaiian natives lived in a sustainable relationship with the *ahupua'a* (self-sustaining divisions of land running from mountains to the sea) maintaining the custom of taking only what was needed in order to leave a share for others in the division and use of agricultural lands that secured cohabitation based on the value of mutual respect for the land and its people. Students see their local space come alive with meaning and come to value its significance through the eyes of others whose ancestors continue to protest the colonization of their lands. Students now drive through space and time in landscapes of historicized meaning that before went unnoticed. They see what their own species has done through modernization and the sensibility of sacredness that has been lost in their relationship with their environment and their own personal inner selves. Their values and sensibilities for the land have changed and this directly impacts their life experiences, their exchanges with others, the environment, and identity in space and time.

6.4.4 Student Generated Projects

The focus of the course is on students creating peace gardens because it gives them a project where they can bring to bear all of their learning-mentally, emotionally, and physically—knowledge and experiences that are creatively centered. Students generate their own ideas in how to incorporate their personal and professional

interests in their project that gives them personal value and offers value to others. One example of a final student project was the creation of a garden in a small rectangular patch of land (4 × 20 feet) on the ground level of her two-story rented apartment building. Jennifer had never thought of doing this before, in fact she didn't know any of her neighbours having lived there for over a year. She decided to just do it and paid for all of the materials herself. To her surprise, she found herself greeted by other neighbours who began commenting on the garden as they passed. Eventually, some began helping her plant. This small plot became a place that nurtured social relationships, helped build a sense of community, and brought inner peace to Jennifer in her experience of giving without expectation of receiving from others. Another student, Carey, following our class visit to the University Lab School, created a peace garden design for the school grounds with the input of the 3rd graders. This was their first effort to plant a garden. Today, the entire school centers its curriculum and school activities in their surrounding peace garden. It has an aquaponics corner, the butterfly garden, the container vegetable gardens, the vertical garden experiment using rain gutters, the composting bin, etc. Once a year, the school conducts an open house and opens it up to the community as young children act as docents educating the public about their sustainable peace gardens. Katie, working on her master's degree, created a curriculum booklet on basic gardening for middle school age students. And Brad selected a renowned environmental artist whose work he admired and infused his art into a curriculum art lesson on natural landscapes.

6.5 Methodology

Over the past decade evaluation of academic programmes in higher education in the United States have turned attention to questioning whether a college education makes any substantial meaningful difference to its graduates. What happens to students after they receive a degree and has their postsecondary education helped them reach their career goals? Today, in times when a perilous economy results in such high unemployment rates and scarce jobs, parents question whether a college degree is worth it or is climbing the ladder through work experience more profitable in 'making a living'. Putting aside the persistent debates about whether a college education is just about enabling students to get a job or create a meaningful life and the current debates about whether educational institutions should be run like a business; the recent infusion of college programme evaluations are no doubt, likewise, economically driven. The point at issue is that while individual course evaluations may tell us something about what students liked or disliked about a course or instructor, it does not tell us what the potential long-term impact of a course may have on a person's personal or professional life. Did they learn anything of lasting value? If it didn't, why offer it? With the skyrocketing costs of a college education, such measures are sought to further justify the value of degree granting programmes.

One of the main difficulties with this type of assessment is keeping track of students once they graduate and, as with any survey, whether the student will respond when contacted. A second difficulty is whether the same conditions in implementation need apply. For example, anonymity of students and post-grade releasing of the student evaluations to instructors are supposed to avoid fear of retaliation from a teacher if they know who the student is who gave any negative evaluation. In post-graduation assessments confidentiality is not seen as critical because there is no grade pending that could be affected negatively by the instructor in knowing the identity of the student. Any relationship of power is no longer in play, unless a student might ask for a letter of recommendation or reference sometime along their future career path. Even so, there is a further assumption that neither a student would ask for a letter of reference from an instructor whom they did not like and similarly, nor would an instructor accept a request to provide a letter of recommendation for a student they felt in disfavour. In fact, in the teaching profession, it is often this later mature reflection when a student finds him or her self in the 'real world' that such evaluations really matter beyond the immediacy of 'getting the grade'.

But what kind of questions should be posed in this case? What form should they take? Are surveys where students fill in the bubble constraining? Are Likert scales adequate in measuring transformations in consciousness? Hmmm, "On a scale of 1–5 with 1 being low and 5 being high, how much would you say your consciousness was transformed?" Does that really tell us anything? Should there be a mix of quantitative and qualitative questions? Should these be closed or open-ended questions? What qualifies as an adequate *measure* or *data* on post-graduation outcomes? A scan of articles about post-graduation data finds that in general many findings are based on economic interests in employment and job-fit. Are students employed in the career for which they studied? Did their college education get them a job? Are they working part-time at McDonalds having invested $100,000 in tuition to get an engineering degree?

Transformational forms of reflection are best represented in narrative accounts provided by subject praticipants through researcher qualitative data gathering techniques written, oral, and visual. Paul Ricoeur (1995) believes that narrative is a way in which people produce an identity, in the telling of the story, beyond the actual facts of the story. Narratives can account for change over time. Stories provide a human "landscape of consciousness" within which individuals think, feel and come to know alongside a "landscape of action" where intentions are constructed, goals are determined, and creative actions are performed (Bruner 1985). Narratives allow individuals to make their meanings about their experiences in memory of the past and carry them over into their immediate circumstances and visions of the future (Boulding 1988). Narrative accounts are able to reveal individuals' conscious reflections on their lives and meta-level reflections on their own interpretation of their reflections. It is more often that retrospectively, individuals give meaning to events in their lives (Polkinghorne 1988, 1991). Similarly, as practiced in ethnographic research, it is often that theories are adjusted or sought to explain the results found after preliminary data analysis.

Analyzing data can be a back and forth process of discovering emergent meaning and searching for theories that fit or adequately contextualize the data in a research programme or body of literature out of which one can extrapolate, make sense, or expand their findings. Narrative accounts provide both descriptive and explanatory analyses over a series of intervening interviews (Clandinin and Connelly 2000). The challenge here is the phrasing of a question or questions that could illicit an adequate narrative response from which the researcher could identify different reflective levels of change and transformation in student consciousness through an email questionnaire.

6.5.1 Subjects

In this pilot study a total of nine students were emailed questionnaires with five questions. Two no longer had the same email address and the emails were bumped back. Seven students returned their questionnaires. Of the seven, four were females, two Caucasian and two Pacific Islanders between the ages of 25–45; three were male; one Caucasian over 60 from Canada, one visiting student from Japan in his 50s, and one Korean American in his 40s. Five students were education majors, the visiting student was a middle school teacher from Japan taking his sabbatical, and one female majored in French.

6.5.2 Questionnaire

The questionnaire was comprised of five open-ended questions. (1) What did you learn in this class that you believe was valuable to your own personal growth and development? (2) Did this class raise your consciousness in thinking about the environment and ecology? (3) Did you feel that since this course you have changed or transformed your way of thinking, being, or lifestyle habits in any way? If so, please describe in as much detail as possible what that transformative effect has been (e.g. on your view of the world, in your relations with others, in your interaction with the environment, in your daily living, in your purchases, in gardening, in your participation with organizations associated with ecology or sustainable goals, community participation, civic responsibility, engaging in environmental activities, volunteer work, creating an environmental related business, furthering your education, in your sensitivity to nature, etc.) (4) Would you recommend this course and why? (5) How would you improve it? In responses where students noted deep changes in their identity a second probe was sent asking them if they could elaborate.

Table 6.1 Reflective types of transformation in consciousness

Types	Instrumental	Communicative	Prepective
Orientation	Pragmatic	Substantive	Critical
Beliefs	Stay the same or expand and enhance existing beliefs	Making sense of new ideas and experiences. Major changes that break with old ways into new directions. Reflections leading to coherence and reintegration of old and new beliefs	Reflexive questioning of own fundamental assumptions, values, and those people, events, experiences, etc. that contribute to their formation
Behaviours/ Actions	Continue in the same lifestyle habits. Gradual adoption of modified behaviors that are congruent with old	Adoption of different behaviors that incongruent with old beliefs and guided by a new set of beliefs. Voluntary stewardship	Shift in reasoning and meaning of routine behaviours. Undergoes lifestyle changes that substantially alter sense of being
Identity	Confirmation of existing self-identity	Acquire a new identity opening new social networks	Complete transformation in identity
Environmental sensibility	Already ecologically and/or environmentally aware	New discoveries and commitments to attaining new knowledge while engaging in environmental activities. Voluntary stewardship	Transformation into being ecologically sensitive, committed to voluntary stewardship of the earth and consciously reflects and makes an effort at lifestyle changes. Engaged environmentalism

Source The author

6.6 Findings

Three student narrative responses are presented below that represent the three types of Mezirow's reflective states presented earlier as part of the conceptual framework for this study. Each level characterizes differing states of consciousness: Type 1: Instrumental/pragmatic; Type 2: Communicative/substantive; and Type 3: Perspective/critical. In Table 6.1: the key features of these different states of conscious change and/or transformed are documented. The transformation of consciousness illustrated in each state denotes alterations in existing beliefs, behaviours and actions, conscious identity and environmental awareness.

The written narrative vignettes are presented below without any grammatical corrections for those students where English is a second language.

6.6.1 Instrumental/Pragmatic Transformation

Ron was the oldest student in the course, an adult in his 60's from Canada, returning to the university in the field of urban planning, from a career as a geologist. He was a newcomer to the field of education but already had an "intense interest in environmental and ecological issues" given his background profession. Two areas of change can be detected from Ron's responses: (1) learning style, (2) commitment to doing something in the field of environmental ecology.

> My involvement in this class has had a significant transforming impact on how I approach learning and daily living. I increased meditation and spiritual endeavours which is facilitating a more passionate approach to learning, as well as enhancing my ability to seek out and committing to emotional intelligent crusades (Ron, male student).

Ron's commitment to helping solve issues in the environment was refocused in his seeing the potential power of education.

> The course has shifted my focus from attempting to change the established unsustainable mindset (was involved in environmental policy development for a mining sector in Canada) to working towards developing an educational environment that will mass-produce an army of individuals of a sustainable mindset (Ron, male student).

Ron was strongly impacted in his learning style due to the transdisciplinary approach to classroom teaching. He thought that the content of the course was beneficial "due to the alternative perspectives introduced that are not found in mainstream education," in ways that "opens students up to alternate thought options and induces critical and multidisciplinary thinking empowering individuals to deepen their understanding of issues that matter to them." Presentation of multiple perspectives challenges students to broaden their interests, "raise and stimulate passion as part of the learning experience".

Ron already had a well-developed ecological mindset and interest in developing sustainable schools before attending the class. He found educational tools to help him become more effective and knowledgeable as a steward of the earth. He displays an instrumental/pragmatic state in that his existing beliefs about himself, the world, and his relationship with others is reaffirmed and strengthened. His learning experience was impacted in a way that motivated his further commitment to being an environmentalist.

> I attended this course due to my intense interest in environmental and ecological issues. The class supported my learning direction and deepened my commitment to continue in this line of study (Ron, male student).

The following summer, Ron travelled to Thailand to learn about the building of green schools there. He continued on as a Master's student with a focus in peace education and developing sustainable green schools.

6.6.2 Communicative/Substantive Transformation

Toshi was a high school English teacher from Japan who was on sabbatical and taking courses for his professional development. Toshi was very thoughtful in recounting his steps in the course and comprehending his own experience and its impact on his professional life.

> First of all, through this course I was convinced that environmental issue should be centered as the core in the school curriculum for the secondary schools in Japan… I came to understand that how to live wise and harmoniously with nature in a sustainable condition is the most important way of living for people all over the world (Toshi, male student).

Toshi acknowledged the value in "subject such as science and biology concerning nature … directly related with nature," and "educational TV programmes such as Discovery Channels or others can motivate kids to learn wonders of nature and harmonious balance of all living things. Therefore, we have to keep their motivation toward nature." He also learned that both developed and developing countries seek a wealthy economy, but "…it is a fact that they sacrificed nature for the compensation of the economic growth" with the "environmental condition on the globe deteriorating year by year". These revelations led Toshi to think further about the impact of technology and media on learning. Toshi more seriously became concerned about the impact of technology on children:

> … kids tend to rely on electronic devices too much in their daily life, such as cell phones, computer games, iPads,… So-called digital natives seem living in a virtual-reality world. I am wondering if these electronic devices can help kids' emotional growth compared with playing outside in nature; on the beaches or in the mountains, I feel that just chasing after 'efficiencies and conveniences' tend to deteriorate the natural growth of kids in the field of education (Toshi, male student).

Gradually, Toshi began to deeply reflect on the taken for granted social and cultural ways of educating in Japan. He sees the need to question the unquestioned acceptance of modern day technological advances and the current trend for schools to require ipads or to purchase them as a needed learning tool. The course opened his eyes to the destructive realities causing the environmental crisis and he questions their effectiveness in contrast to the service learning aspects of the course.

> At school, ordinary class is conducted in the classroom and students can know how serious the environmental situation is only through information via texts of media. However, students tend to be stuck in a dilemma, because the more they know how serious the situation is, the powerless they feel themselves for the solution. I know how important it is to make people bear eco consciousness in their mind. But trying to appeal the students with popular approach to environmental education, it often ends in vain. Only emphasis on facts about the symptoms of environmental destruction gave the students only a sense of powerlessness. The students feel that they can do nothing, for example, to stop global warming (Toshi, male student).

Toshi sees much more value in the service learning trips that were taken during the semester where he participated in the restoration of the waterways and crop

barren fields. He remembered the "fieldwork such as removing weeds along the waterway in the city of Honolulu" where the class had joined high school students to clean up the local watershed channel in their district. The instructor "took us to Kaua'i Island to join Hawaiian native tree planting activity …. It was a great experience for me to know that alien plants as well as insects and animals brought unconsciously by foreign tourists have invaded Hawaii and caused extinction of the native plants and animals."

> I had not known everything about Manoa Heritage [Center] until I went there. However, preserving the sacred agricultural site, Kuka 'O 'O Heiau taught me that original habitants of Hawaii basically relied on agriculture for their diet. Naturally, they thanked that they were blessed with the nature: affluent amount of rain, sunshine, and rich soil. They knew that this environment was not what human beings made, but these blessing was thanks to the geographical location and the volcanic region.
>
> Without visiting these places, I would not have realized how important nature is and how Hawaiian people depended on nature (Toshi, male student).

Toshi was "shocked to know that plastic garbage polluted beaches in the Pacific Ocean. Tremendous numbers of marine creatures are still suffering from plastic trash by swallowing them by mistake. Inside of the stomach of the dead sea-animals such as turtles and albatrosses are full of plastic garbage." Japanese tourism is the biggest sector of the economy for Hawaii. Toshi said he thought that because all Japanese tourists only stay in Waikiki that they think all of Hawaii's beaches are pristine. His experience participating in an environmental activity had a long-lasting impact.

> Thinking about the whole environmental issues I touched, they are too many and too heavy for me. Then I concluded that I should focus on just a few things that I can do. They are taking care of the forest and 'beach cleanup activity'. From the beginning I have been interested in caring forests in Japan. I thought that making more use of wood and bamboo could be one of the solutions to reduce plastic garbage in the sea. I mean that using daily goods, which are made of natural material, such as shopping bamboo basket or a cloth as much as possible can lead to reducing plastic bags at supermarkets (Toshi, male student).

When Toshi returned to Japan, he joined the student environmental projects that he had felt too busy to bother with before. He also began visiting recycling companies "to learn an effective way of reducing plastic garbage" and befriended an inventor of an oil converter machine that he wanted to send to Hawai'i. Toshi began accompanying his students to international environmental conferences sponsored by Toshiba to learn how other countries talk about and solve their environmental problems. He took an online course learning website technology and "create[d] a website in the Internet in order to inform as many children as possible about the polluted sea by plastic garbage". He was so moved that he "began to rethink what is important for human life" and saw his work as an educator for environmental awareness more fulfilling than his teaching English as a second language, what he had done all of his professional life.

> It is important for teachers to lead students or other ordinary people of the next generation to the right direction.

> My life as a schoolteacher has changed into more active one since then… I really appreciate this course. I would like to recommend this course to the students who want to spend their lives for the rest of the world as well as for themselves (Toshi, male student).

Toshi undergoes *substantial* change in his way of thinking about his professional commitments as a teacher and his new found purpose in life—environmental care and restoration. He has grown to appreciate nature and discovered a new way of relating to it. He coupled his thirst for knowledge with his identity as a global citizen reach beyond his national boundaries in correspondence with others through his website.

6.6.3 Perspective/Critical Transformation

Bae looks at his lifespan and the broader impact that the course had on his relationship with himself, others, the environment, and the global community as well as his professional identity, changes in his behaviours as an individual and professional teacher.

> This course has definitely helped me to awaken, to be conscientious, and to think critically of my milieu. The rigor of the reflective writings, online discussions and reading materials helped me to be able to think beyond the formal intellectual, abstract mode toward a wholesome way to genuinely care for the environment and ecology…raised my consciousness to be able to have planetary thoughts, beyond narrow ethnocentric mode of thinking (Bae, male student).

Bae reflects on his own framework of consciousness and how he has been socialized and conditioned to accept the culture of war consumer mentality as 'legitimate'.

> As an educator, it was empowering for me to experience firsthand the power of education in its ability to transform a person's dominant perspective. Making a shift form a myopic 'consumer' consciousness to ecological consciousness, I became more aware of the human potential to discover our relation to everything that is outside of us (Bae, male student).

He also sees the ethical and moral dimensions of his expanded consciousness and the necessity of putting knowledge into practice for some larger good.

> Moreover, I believe that my capacity for virtue grew as my consciousness evolve through this course. Coming to understand that most of our problems are a problem of consciousness, I learned that its not important how intelligent or knowledgeable a person is, but it is critical how our consciousness is used to employ intelligence or knowledge either for good or evil ends (Bae, male student).

Including an ethical dimension in his teaching to raise middle school students' awareness about environmental issues necessitated a change in his instructional methods.

> As an educator I am employing more integral pedagogy as my evolved consciousness necessitates me to make a paradigm shift in how I relate to students, and how they learn. (Bae, male student)

Mezirow talks about reification as forms of socio-cultural distortion that "pertain to power and social relationships, especially those current prevailing and legitimized and enforced by institutions. A common sociocultural distortion is mistaking self-fulfilling and self-validating beliefs for beliefs that are not self-fulfilling and self-validating" (Mezirow 1991: 15). Sartre (1985) talks about this phenomenon as an "internalization of the external" in acting within the "practico-inert" of established institutions. Here, Bae reflects on his own reification of the 'prescribed role' of the teacher supported by his educational institution and how he has become more of a feeling, loving, thinking person in the process.

> I can say that my behaviour before in relating to my students and animals was 'disconnected', aloof, and even indifferent. I was preoccupied with trying to fulfill externally prescribed role as a teacher and felt disconnected from my real self with the role (Bae, male student).

Bae has become more engaged in determining the meaningfulness of his curriculum set for his students. This transformation in consciousness also changed his way of relating to his students. He is willing to challenge the status quo in ways he did not imagine before with a new conviction derived from his experiential learning.

> I am asking larger questions in social studies classes to engage students with broader views of the world. In organizing curriculum, I try to reflect the important and exigent issues of human and environmental survival. This approach gives me courage to challenge and reject administrators' and parents' pressure to perpetuate narrow vision of outdated pedagogical assumptions (Bae, male student).

Furthermore, Bae sees his own continued growth as a *whole* person reflected in his professional growth as a teacher.

> As an educator, acquiring ecological consciousness made me rethink the purposes of learning. My intellectual emphasis, loyalties, and convictions have changed. What I try to accomplish has essentially become community practice than mere ideology. As I feel more integrated as a person, I am able to relate to my students better. It has made me more authentic and with more capacity to love, I found new meaning in being a teacher (Bae, male student).

Bae's personal lifestyle habits have also changed.

> My eating habits have changed to become more or less vegetarian unless I can find organic meat and poultry, and I shop for non-GMO produces from local markets whenever or wherever I can. I shop for eco-friendly household items, being mindful of their impact on the environment while in use and after they are discarded. I recycle almost everything. I am eager to learn about garden to become self-sufficient. I engage in a number of community parks and beach cleanups. My relationship with animals has improved and I appreciate our dog as a helpful living companion than as a mere pet (Bae, male student).

Bae delves even deeper into his childhood to look for answers, what was transformed and what he'd like to become more fully as a human being.

> I left South Korea when I was 15, in 1979. It was a period when the country was undergoing massive industrial production and rapid modernization. Air pollution was a

> serious problem as it is in Chinese cities today and it seemed as if any natural resources available were exploited in the name of national "survival." I think I just grew up thinking that nature was to be tamed and used for the benefit of human comfort. Being a burgeoning third world country, "survival of the fittest" and competitive mindset was inculcated from elementary school. In the everyday language, the word "kill" was widely used, as in "kill the communists," "I'll kill you in competition," "I'll succeed even if I have to kill myself" etc.
>
> Although I grew up in a loving family, I remember taking pleasure in killing insects in sadistic manner-injecting caterpillars with pesticide using a syringe, putting spiders on a hot charcoal to watch them burn, stepping on hundreds of ants, burning up ants with a homemade flame thrower (holding a lighter and spraying it with flammable mosquito spray can-crazy!!!), throwing bricks on a snake, etc. I remember growing up with little empathy for other living beings, never mind other human beings in less fortunate situation. In village markets, animal parts hung in the butcher shops for sale-heads, legs, intestines, etc.—and I guess I thought animals existed for human consumption. We did raise many dogs at home, a dozen a time, but they lived outside even in below freezing harsh winters. It never occurred to me that dogs could live inside the house with humans. They were lesser beings.
>
> There simply was no environmental awareness education and I grew up as a 'consumer' with little regard for the consequences of my consumer activity. Basically, I was out of touch with myself and my relation to the environment.
>
> I think I began to develop some environmental awareness when I read Buddhist philosophies after graduating from college but the definite shift took place after taking your environmental education course in my 40 s. In that regard, I'm a believer that environmental education CAN change a person's perspective.
>
> I have so much regrets for having been such an insensitive and cruel person for the animals and sorry for the environment for all the waste that I contributed… Just imagining that there could be billions of people like me is a scary prospect (Bae, male student).

Bae reflects on the social-cultural influences throughout his childhood and youth that, as all youth, are those unconscious forces beyond their comprehension. Teachers are in an exceptional position to open the perspectives and provide experiences that go beyond family in educating about environmental issues. Bae demonstrated a full-blown *perspective transformation* in all aspects of his identity with himself, others, the environment, and the global planet.

6.6.4 Summary Analysis

As a preliminary pilot to further research about how to transform students' consciousness in becoming stewards of the earth through education, this chapter looks at a peace environmental course design, content, pedagogy, and assignments that garnered these kinds of changes. As we can see from the three case studies above when combining the principles of peace and environmental education guiding the course curriculum, design, assignments and activities, there can be transformative affects on student consciousness that follow into professional careers. Bae now loves teaching his middle school students and relates to them as members of his *ohana* (extended family). Last year he told me that he was so moved that he cried at his students' graduation ceremony which he could never

have imagined before. Jennifer now is one of the teacher leaders at her high school and has integrated environmental activities and sustainability practices in her art classes. Carey works as an education specialist for a local non-profit group that manages after-school programmes and helps schools develop gardens.

6.7 Conclusions and Further Research

This chapter set out to respond to the call for ways that enable sustainable transformation and sustainable peace by promoting an educational project involving a course in environmental peace education tied to the broader vision of creating peace gardens in schools. I have presented a pilot that presents preliminary results in teaching an environmental education course from a peace perspective and its transformational impact on students in a post-graduation follow-up. In doing so, I have raised many more questions than I may have simply answered. As a small step, in the hope of raising interest in a research programme that looks at the transformation of human consciousness towards peace ecological mindfulness, what are some of the educational components needed? We know that at the very least, the following course components are critical to include: (1) outdoor experiences that expose students to the material reality of environmental problems along with their participation in restoration activities; (2) experiences that reveal another culture's way of relating to nature and living sustainably within its environmental resources; (3) a transdisciplinary perspective that includes the presentation of multiple disciplinary critical perspectives in content, approaches to investigating the problem, collaborative resolutions to problem-solving and problem-posing; (4) openness to all learning pedagogies appropriate to the conditions of learning, contexts and capability of learners and content goals; (5) assignments that reflect respect and empower learners to take responsibility for their learning outcomes in a way that combines student personal/professional interests with service to others and the global community. (6) The guidance of peace and ecological values and principles of equality, mutual respect, social justice, solidarity, trust, non-discrimination, openness, flexibility, and empowerment in class discussion, course assignments, design, instructional pedagogy and outcomes.

Further research also needs to be developed about the nature of change and transformative processes in human consciousness, reflective processes of perspective taking and their translation into action in combined peace and environmental studies. Clearly, as an emergent state, consciousness about the intentional background or network of beliefs cannot be adequately researched in the traditional approaches to human cognition whereby knowledge and experience are categorized as individuated, unstructured, and isolated units or bits of information. Reflections that lead to self-understanding and transformation of consciousness are best conducted with the use of narrative inquiry, hermeneutic, phenomenological, critical and intentional studies in the investigation of meaning making cognitive organizing processes. If there are different degrees of criticality and change, what

are the delimitations of these wholistic boundaries? If reflection is a retrospective process, how does memory relate what is valued in the past and operate in interpreting present experiences or anticipate future events? Does memory get in the way of a sustainable peace when the cultural (and dialogical) context is bathed in association with the politics of war and social-institutional-cultural acts of violence?

Hopefully this chapter presents new ideas for educators who are interested in transforming schools and seeing them as effective institutions of change for creating ecologically peace minded people who work towards a more peaceful and sustainable world in all that they do because they know what it's like.

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