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Nesting Like Birds, Teaching Like Spiders: Emerging Visions in U.S. Higher Education for Biocultural Sustainability and Ecological Literacy Education

Ariana Marta Francesca Kramer

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THESIS APPROVAL


The abstract and thesis of Ariana Marta Francesca Kramer for the Master of Science in Education: Educational Policy, Foundations, and Administrative Studies were presented June 2, 2005, and accepted by the thesis committee and the department.

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ABSTRACT

An abstract of the thesis of Ariana Marta Francesca Kramer for the Master of Science in Education: Educational Policy, Foundations and Administrative Studies presented June 2, 2005.

Title: Nesting Like Birds, Teaching Like Spiders: Emerging Visions in U.S. Higher Education for Biocultural Sustainability and Ecological Literacy Education

Sustainability education is a growing field still being defined. It draws from environmental education, but includes social justice and economic equity alongside environmental health. International efforts to define the parameters of sustainability education at the university level have called for interdisciplinary approaches that emphasize culture. However, in the United States most programs concerned with sustainability follow in the footsteps of environmental studies with a focus on science and public policy.

Seven interdisciplinary master's programs in sustainability education were reviewed as potential models for how the larger university system might approach teaching for sustainability. Document analysis was used to compare program

structure, philosophy, pedagogy, and curriculum of programs located at Antioch University, Eastern Michigan University, Lesley University, New College of California, Portland State University, Prescott College, and Saint Mary-of-the-Woods College. Interviews and focus groups were conducted with faculty and students of Portland State University's program to record their thoughts on teaching ecoliteracy within a sustainability context. The primary study questions are (a) can education and leadership programs in sustainability provide useful models for university education as a whole? and (b) how might sustainability redefine ecoliteracy?

Qualitative analysis of this research suggests that master's degree programs in sustainability education are modeling ways to create institutional culture that supports biocultural sustainability by (a) institutionalizing their commitment to sustainability, (b) reinforcing this commitment through pedagogy, (c) exploring ways to provide depth and breadth in sustainability curriculum, and (d) utilizing collaborative approaches to leadership. Students at Portland State University's program feel that an ecoliteracy curriculum should emphasize the ecological, personal, spiritual, ethical, cultural, regenerative and restorative aspects of the human-nature relationship to be most effective for teaching about ecology within a sustainability context. This ecoliteracy curriculum would use nature as classroom and text; teach from multiple cultural and disciplinary perspectives; include science, traditional ecological knowledge, creative arts, ritual and ceremony; teach practical

skills for rebuilding a natural economy; and provide students with opportunities to develop cross-cultural relationships and communication skills for speaking about ecology to multiple stakeholders.

(NESTING LIKE BIRDS, TEACHING LIKE SPIDERS:)
EMERGING VISIONS IN U.S. HIGHER EDUCATION FOR BIOCULTURAL
SUSTAINABILITY AND ECOLOGICAL LITERACY EDUCATION

by

ARIANA MARTA FRANCESCA KRAMER
/i

A thesis submitted in partial fulfillment of the
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in
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family, friends, teachers, students, and kindreds, in all your many living forms -- you are twinkling reminders that the distances between us are not too far to travel.

Finally, I must also acknowledge that in many ways the scope of this project has extended beyond what I anticipated, and has pushed the boundaries of my knowledge in several directions at once. While I have attempted to the best of my ability to approach the synthesis of the different areas I explore here with care and reserve, I am well aware that I am a novice in the field and so, while I am hopeful I have done a sufficient job at summarizing texts, policies and papers, I am also cognizant that I have probably missed the point on more than one occasion. With due respect to all I've misunderstood and mistaken, I hope the reader may, nonetheless, find something of use in these pages, and in the attempt I've made here to articulate the meaning I've gathered from a learning process still unfolding.

This thesis is dedicated...

to my grandfather, Henry P. Kramer, who was in the process of dying as I was writing it. You have always served, in your scholarship and zest for life, as a grand teacher and mentor.

Chazak.

for this blue body we call home.

*We have a beautiful mother
Her green lap immense
Her brown embrace eternal
Her blue body everything we know.
-Alice Walker*

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LIST OF ABBREVIATIONS

AEI – Audubon Expedition Institute, Belfast, Maine

Antioch – Antioch University, Seattle, Washington

EMU – Eastern Michigan University, Ypsilanti, Michigan

LECL - Portland State University's master's program in Educational Leadership in Ecology, Culture and Learning

M. A. – Master's of Arts degree

M. A. T. – Master's of Teaching degree

M. S. – Master's of Science degree

New College – New College of California North Bay, Santa Rosa, California

PCSD - President's Council on Sustainable Development

Ph. D. – Doctor of Philosophy degree

PRE – Prescott College, Prescott, Arizona

PSU – Portland State University, Portland, Oregon

St. Mary – St. Mary-of-the-Woods College, St. Mary-of-the-Woods, Indiana

UN - United Nations

UNESCO - United Nations Educational, Scientific, and Cultural Organization

PREFACE

Throughout the introductory chapters of this thesis I have interrupted the text by inserting drawings of bird's nests and sections of a poem about nests. The illustrations are the work of Joan Dunning, and appear in her book, *Secrets of the Nest*, as cited. The poem is my own work, and is included in its entirety at the end of the closing chapter. Inclusion of these nested interruptions is intended to draw the reader's attention periodically away from my text about sustainability education, to focus on real world examples of sustainability. They are meant as reminders of what we can learn directly from our wild neighbors about the work of creating containers within which to hold new generations. They are included not for mere entertainment, nor as distractions, but as an opportunity to engage in a different way of thinking of sustainability education that is more informative than simple text. Simply put, they are intended to remind my readers about what it is we are really talking about: the humble survival and sustenance of generations.

Throughout the final chapters I have periodically included poems I wrote as part of an autoethnographic exercise I undertook while writing this thesis. This poetry is included so as to provide the reader with insight into the perspective from which I approached this work, as well as to inform the topic at hand. Authorship of these poems is mine, indicated by "A. Kramer" at the end of each poem. These

poems are titled, in order of their appearance, “Pledge of Allegiance, Pueblo
Style: San Geronimo Feast Day,” p. 143; “Dissection,” p. 170; “Spiders,” p. 206;
“Untitled,” p. 212 (excerpted from a longer poem); “Zebrafish I,” p. 235;
“Zebrafish II,” p. 236; “Zebrafish III,” p. 236; “Untitled,” p. 272.

CHAPTER I

BEGINNINGS

I am sitting in a classroom of peers. The scent of lavender and rosemary is drifting from clippings laid out on a bright blanket covered with birds' wings, eggs, nests, skeletons and feathers. Straight, bare branches and supple, flexible branches and soft stems with leaves of all sorts are scattered on the blanket as are grasses, seaweed and flowers. We are in a typical university classroom with tables, chairs and small windows. Today the tables and chairs are pushed back and we sprawl our bodies haphazardly on the blanket placed in the center of the carpeted floor. Flute music, inspired by birds, plays in the background. We are exploring birds and their nests in a class presentation created by two of my classmates and myself.

Paige Shell-Spurling, Tim Holbert and I are weaving together poems, stories and music into a 30 minute lesson we've developed for our classmates in Ecological and Cultural Foundations of Learning. Paige reads a passage she's written about the details of bird migration -- how birds are able to navigate thousands of miles of territory to find their breeding grounds, taking cues from the sun, moon, stars, earth's magnetic field, and landmarks. She draws from

information learned in an ornithology class on the other side of campus. I lead the group in a call and response poem I penned that describes different types of birds' nests -- most everyone laughs at its silliness. Tim tells an animated story -- an old tale from northern Europe about a king who can understand the language of birds.

Meanwhile our classmates are busy working in small groups. Instructed not to speak, they are relying on whistles and body language for communication, gesturing and watching one another intently as they move into a rhythm of work. They are building nests -- all different types -- using hazelnut branches, tall field grasses and brown ropy seaweed gathered from the coast as base structures and filling them in with a variety of soft leaves and flowers. Some nests are cups, others look more like platforms. Each has a distinctive shape, color and smell as the nest making materials combine in different patterns, expressing the moods and minds of the people who make them as well as the negotiations that come from working in tandem with others and with the limitations of the materials they've been given to use.

culture

ecology

learning

leadership

These are words we are experimenting with -- picking them up, turning them over, trying to make sense of how they fit together. We are students in a new program in Educational Leadership at Portland State University, titled Leadership in Ecology, Culture and Learning, one of many new initiatives and programs in

higher education attempting to shift the paradigm we use for learning and teaching. We are trying and failing, doubting, and trying again. In our efforts, we are not so unlike the birds who live among us. It is spring. Sparrows are gathering twigs, bickering, and -- in the eaves of our houses -- constructing places to hold eggs.



ground nest¹

This study is an exploration of sustainability education as it is being defined in theory and in practice at higher education institutions in the United States. It begins by examining some of the international and national visions constructed to guide the direction of sustainability education in higher education. From here it moves on to analyze how a few U.S. graduate programs, designed to prepare future educators and community leaders of biocultural sustainability, are helping to define sustainability education through practice, and explores some of the emerging

¹ From *Secrets of the Nest*, (p. 18), by J. Dunning, 1994 by Houghton Mifflin. Reprinted with permission.

visions from one of these programs for how to teach ecoliteracy within a sustainability context.

The United States has one of the best university systems in the world, and is responsible for educating many of the world's leaders. As a wealthy nation it has benefited from the fruits of a global market economy and contributed disproportionately to the disruption of local and regional economies and the degradation of biological and cultural communities because the current global market is based on unsustainable principles and practices. For these reasons, the higher education system of the U.S. has a moral obligation to utilize its vast resources to address issues of sustainability within its curricula and research agendas. Numerous international and national efforts collectively provide clear guidelines for how higher education in the United States can perform this task and educate students to lead society toward a sustainable future. These guidelines call for interdisciplinary approaches that can educate students about the ethical and biological basis for biocultural sustainability. They call for education that shifts cultural norms. However, most sustainability initiatives in higher education remain in the realm of science, technology, policy, and university operations, and many perpetuate the same ideologies that contribute to unsustainable practices. Since policy and practice are informed by cultural values, sustainability education will likely be most effective when it provides students with opportunities to explore the cultural and ethical dimensions of sustainability more fully in the curriculum.

While universities and colleges are asking questions about how to best address sustainability in the university curriculum so as to affect cultural change, a few education and leadership programs are seeking to answer similar questions on a smaller scale. The focus of my research is to examine how programs designed to prepare students to educate and provide leadership for sustainability are answering these questions. Can education/leadership programs in sustainability provide useful models for university education as a whole? What philosophies and pedagogies have they embraced? What program structures are used? In what ways are the three aspects of sustainability (ecology, society/culture and economy) addressed? How are leadership and education defined in the curriculum?

Further, this study is interested in questions about ecoliteracy. The average U.S. citizen has little useful knowledge about the natural environment. Studies have shown that while information about the natural environment is prevalent most people don't have the skills to assess and make meaning of this environmental information (Coyle, 2004; Kempton, Boster & Hartley, 1995). Environmental campaigns that have served to champion a particular environmental cause have sometimes created a strong impression in the public's mind that has outlasted the truth of their message (Coyle, 2004, chap. 2). This kind of misinformation can lead even people who care about the environment to unknowingly behave in ways that harm the environment, or direct their energies in ways that are not as effective for environmental protection as they might be. In addition, as the urban population grows and healthy ecosystems become rarer and increasingly disconnected, more

people are failing to recognize patterns and details of the natural systems to which they belong and consequently have little awareness of how they affect these systems in either harmful or beneficial ways. As people spend less time outdoors observing healthy natural systems they are increasingly likely to be reliant on media information about the environment and less able to evaluate it.

This study asks how educators can best teach about nature and the human-nature relationship so as to promote a culture imbued with sustainability values. How might sustainability redefine ecoliteracy? Does ecoliteracy for sustainability differ from environmental education? How might sustainability education expand the way educators teach about nature and the human-nature relationship? What does the new generation of sustainability educators and social change leaders say about this? How do they want to learn and teach about ecology and the relationship between humans and nature? What kinds of ecological knowledge and skills do they feel are necessary to create a culture that will support sustainable decision-making?

I researched the first set of questions by conducting a comparative document and website analysis on seven master's programs in education or leadership for sustainability. Program structure, philosophy, pedagogy, and curricula were compared and analyzed. To answer the second set of questions, I engaged in dialogue with my graduate program peers and faculty. I interviewed five students individually from Portland State University's master's degree program in Educational Leadership in Ecology, Culture and Learning (LECL). We

discussed their relationship to the natural world and their recommendations for a hypothetical class that would teach students like them about the natural world and the human-nature relationship. I held two focus groups with six additional students and asked them what ecological skills and knowledge they felt the ecology component of our program should address to best meet their needs. I also interviewed the two program co-directors (and faculty members) to gain insight into their vision for the program.

My interest in pursuing this course of study has been multifaceted. First, I am myself a student of Portland State University's LECL program and was interested in conducting research so I might engage my own learning community in further dialogue about its goals and philosophy so as to contribute to its continuing development. Second, I wanted to better understand how my program, and programs like it, fit into the national and international discussion on sustainability education in higher education. Third, I wanted to explore how visionary definitions of sustainability education might be informed by on-the-ground, practical, working definitions of sustainability education, and vice versa. Fourth, given the critical need to develop ecoliteracy in the United States, I wanted to explore with my learning community how ecoliteracy might be developed within a sustainability framework rather than an environmental framework.

The results of my research suggest that master's programs for education and leadership for sustainability are modeling how to create an institutional culture that supports biocultural sustainability values and practices in ways that may have

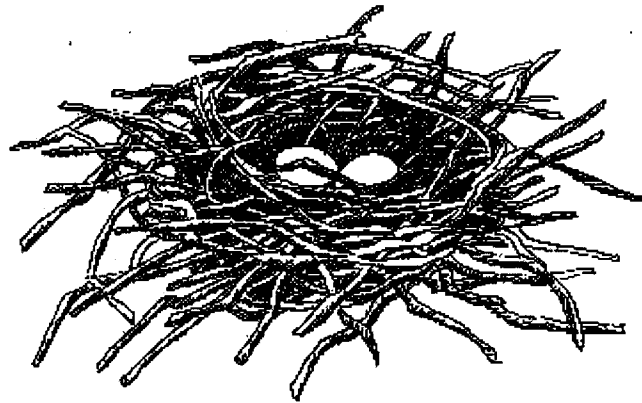
relevance to broader discussion about how university systems can create a culture of sustainability. These programs have institutionalized their commitment to sustainability. They are reinforcing this commitment through pedagogy that utilizes community-based learning, respects lived experience and recognizes the cultural aspect of sustainability. They are also exploring ways to provide depth and breadth in areas of sustainability, and are utilizing collaborative approaches to leadership.

International and national agendas for sustainability education in higher education have consistently spoken to the need for education that is interdisciplinary, reorients university research to serve community needs and aims to transform culture. Programs in education and leadership in sustainability provide diverse strategies for addressing each of these areas in higher education. Students preparing to lead social change for sustainability suggest that a redesigned curriculum emphasizing the ecological, personal, spiritual, ethical, cultural, regenerative and restorative aspects of the human-nature relationship would be most effective for teaching about ecology within a sustainability context. This ecoliteracy curriculum would use nature as classroom and text and teach from multiple cultural and disciplinary perspectives. It would include science, traditional ecological knowledge, creative arts, spirituality and ceremony, and practical skills for rebuilding a natural economy. It would also give students opportunities to develop cross-cultural relationships and communication skills they could use when speaking about ecology to multiple stakeholders.

CHAPTER II

VISIONS OF THE EARTH, VISIONS OF HUMANITY

Until recently, the planet was a large world in which human activities and their effects were neatly compartmentalized within nations and within broad areas of concern (environmental, economic, social). These compartments have begun to dissolve. This applies in particular to the various global 'crises' that have seized public concern. These are not separate crises: an environmental crisis, a development crisis, an energy crisis. They are all one. (World Commission on Environment and Development, 1987, p. 4)



platform nest¹

¹ From *Secrets of the Nest*, (p. 19), by J. Dunning, 1994 by Houghton Mifflin. Reprinted with permission.

Global Visions of Higher Education for Sustainability

In the 1990s, in light of a growing consciousness surrounding the connected nature of environmental, social and economic problems, leaders of institutions of higher education began to formally organize to address issues of environmental, social and economic sustainability within universities and colleges. A number of international declarations were drafted including the *Talloires Declaration* (1990), *Halifax Declaration* (1991), *Swansea Declaration of the Association of Commonwealth Universities* (1993), *Kyoto Declaration of the International Association of Universities* (1993), *Copernicus University Charter for Sustainable Development of the Conference of European Rectors* (1994), and *Thessaloniki Declaration* (1997). Themes which run through these declarations challenge universities to address sustainability in curriculum and research, model sustainable practices in structures and operations, and partner with government, non-government organizations (NGOs) and the private sector to address issues of sustainability. In addition, the declarations address the unique ethical obligation that universities have in contributing to a sustainable future.

The last of these, the *Thessaloniki Declaration*, arose from the International Conference on Environment and Society held in Thessaloniki, Greece in 1997. In preparation for this meeting, the United Nations Educational, Scientific and Cultural Organization (UNESCO), as the Task Manager of Chapter 36, Agenda 21 from the Earth Summit in Rio de Janeiro charged with helping to “refine the

concept and key messages of education for sustainable development” (United Nations Commission on Sustainable Development, 1996) produced a paper summarizing the thinking of international experts. These included a number of United Nation programs as well as The World Conservation Union (IUCN), Organisation for Economic Co-operation and Development (OECD), World Health Organization (WHO), World Bank and the Greek Organizing Committee for the Thessaloniki Conference. Titled *Educating for a Sustainable Future* (UNESCO, 1997), this paper was used as the main background paper for the Thessaloniki meeting, and was meant to stimulate discussion on how education -- both formal and nonformal -- at all levels can contribute to the sustainable development of humanity. In this paper the concept of “sustainable development” is discussed and further refined; in particular, paragraph 36 is illuminating.

Yet, while there are many definitions of sustainable development, it can perhaps be better understood as an emerging vision rather than as a neatly defined concept or relationship. In truth, it is as much an ethical precept as a scientific concept, as concerned with notions of equity as with theories of global warming. Sustainable development is widely understood to involve the natural sciences and economics, but it is even more fundamentally concerned with culture: with the values people hold and how they perceive their relations with others. It responds to an imperative need to imagine a new basis for relationships among peoples and with the habitat that sustains human life. (UNESCO, 1997, para. 36)

This emphasis on the importance of culture, perceptions, ethics, values and relations in defining a sustainable future is useful as we think about the role of education, and particularly higher education. Further, if we are to understand sustainability development as an “emerging vision” then the *Earth Charter*,

produced by the Earth Charter Initiative (2000), is a useful tool for understanding what kind of vision is emerging from the international community.

The United Nations sponsored Earth Charter Initiative was launched in 1987 to engage the international community in dialogue about our common values and goals (Earth Charter Initiative, www.earthcharter.org). The participatory process that led to the documentation of the *Earth Charter* involved thousands of individuals and hundreds of organizations from all regions of the world. It included the voices of experts as well as communities, and represented diverse cultural, religious and geographic viewpoints. The *Earth Charter* represents the intellectual work of the international community, and incorporates principles found in contemporary science, international law, religion and philosophy. The charter was brought to the U.N. World Summit on Sustainable Development at Johannesburg, South Africa in the summer of 2002. Although the *Earth Charter* was not officially endorsed by the U.N. General Assembly at the Summit, it did influence the conference proceedings. Many supporters spoke in favour of the charter, and UNESCO formally announced that it would lead two initiatives in higher education based on *Earth Charter* principles: *Global Higher Education for Sustainability* (GHES) and *Teaching and Learning for a Sustainable Future* (TLSF) (Earth Charter Steering Committee and International Secretariat, 2002, pg. 4). In December 2002, following the Johannesburg Summit, the United Nations General Assembly declared the decade from 2005-2014 to be the Decade of Education for Sustainable Development.

Two important recommendations that the work of UNESCO has brought forward with respect to how the international community should respond to the need for sustainability education deserve emphasis. First, as noted previously, UNESCO has recognized the need to define sustainability in broad terms that span the academic disciplines of natural sciences, humanities and social sciences, as well as boundaries between academia and community life.

Reorienting education to sustainability requires recognizing that traditional compartments and categories can no longer remain in isolation from each other and that we must work increasingly at the interface of disciplines in order to address the complex problems of today's world. This is true both within education, where interdisciplinarity is slowly and with difficulty gaining ground, and between the spheres of education, work and leisure as lifelong learning emerges as a key concept for planning and developing educational systems. It is also true as concerns the most important boundary of all: that separating those included in education systems from those who are excluded from them. (UNESCO, 1997, para. 57)

Second, in calling for the breadth of an interdisciplinary approach, UNESCO makes it clear that sustainability education should also make use of the depth that disciplinary focus provides. In terms of higher education, specifically, UNESCO notes that sustainability education should be included in the training of “journalists, engineers, managers, doctors, lawyers, scientists, economists, administrators, and numerous other professions,” as well as programs for “teachers, senior managers, local leaders such as mayors, parliamentarians and others in leadership positions.” (UNESCO, 1997, para. 90) Of specific interest here, is UNESCO's focus on teacher education. One of UNESCO's initiatives announced at the 2002 World Summit, *Teaching and Learning for a Sustainable Future* (2002), was designed

specifically to provide tools for the professional development of teachers and other educators (Earth Charter Initiative, 2002). UNESCO has long recognized that educating formal and nonformal educators about sustainability issues and providing them with tools for creating a culture of sustainability is a “priority of priorities” for sustainability education (UNESCO-UNEP, 1990). Having noted some of the international work that has helped to define the role of higher education in sustainability, I will now examine some of the visioning work that has been done within the United States to define the role of universities and colleges with regards to sustainability.

National Visions of Higher Education for Sustainability in the U.S.

Higher education institutions bear a profound moral responsibility to increase the awareness, knowledge, skills and values needed to create a just and sustainable future. These institutions have the mandate and potential to develop the intellectual and conceptual framework for achieving this goal. They must play a strong role in education, research, policy development, information exchange and community outreach and support. The 3500 institutions of higher education in the United States are significant but largely overlooked leverage points in the transition to a sustainable world - they influence future leaders through their students and current leaders through their alumni. They have the unique freedom to develop new ideas, comment on society, and engage in bold experimentation, as well as contribute to the creation of new knowledge. (President’s Council on Sustainable Development, Public Linkage, Dialogue, and Education Task Force, 1995)



burrow nest²

Leaders of universities and colleges in the United States have been active participants in the international debate concerning the role of higher education in sustainability. The previously mentioned *Talloires Declaration* (1990), which influenced many subsequent declarations and statements regarding the role of the university and university leaders in promoting a sustainable future, resulted from a conference organized by Jean Mayer, President of Tufts University, held at the Tufts European Center in Talloires, France. This declaration called for the following ten leadership actions:

1. Increase Awareness of Environmentally Sustainable Development...
2. Create an Institutional Culture of Sustainability...
3. Educate for Environmentally Responsible Citizenship...
4. Foster Environmental Literacy for All...
5. Practice Institutional Ecology...
6. Involve All Stakeholders...
7. Collaborate for Interdisciplinary Approaches...
8. Enhance Capacity of Primary and Secondary Schools...
9. Broaden Service and Outreach Nationally and Internationally...
10. Maintain the Movement (*Talloires Declaration*, 1990)

² From *Secrets of the Nest*, (p. 19), by J. Dunning, 1994 by Houghton Mifflin. Reprinted with permission.

Underneath each major action item, a more detailed explanation was provided.

Action Item #7 called for “interdisciplinary approaches to curricula, research initiatives, operations and outreach activities,” Action Item # 4 called for developing “the capacity of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students,” and Action Item #8 called for creating “partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment, and sustainable development” (*Talloires Declaration*, 1990). According to Calder and Clugston (2003, p. 3), the *Talloires Declaration* is the international declaration on sustainability in higher education signed by the most U.S. colleges and universities. As of May 2005, 104 U.S. higher education institutions have signed the declaration (Association of University Leaders for a Sustainable Future, May 2005).³

During the mid-1990’s several conferences and reports helped to further define the role of universities and colleges in the United States in moving towards sustainable solutions to the world’s environmental, social and economic troubles. In February 1994 the first national Campus Earth Summit was held at Yale University. A report, titled *Blueprint for a Green Campus* (Campus Earth Summit,

³ It should be noted that many institutions that have not signed the Talloires Declaration have made significant efforts to address sustainability on their campuses, such as Florida Gulf Coast University and Lewis and Clark College. Furthermore, some of those campuses who have signed the declaration do not appear to have made much progress with implementation (see Shriberg & Tallent, 2003) so the significance of signing the Declaration may not be as meaningful an indicator for judging sustainability initiatives on U.S. campuses as it might appear to be.

1995), was produced as a result of discussions with over 500 faculty, staff and students from 120 U.S. universities and 29 international universities (Campus Earth Summit, 1995). Among its recommendations, the *Blueprint* called for an interdisciplinary approach to environmental issues in the curriculum, noting that “the current educational system favors traditional disciplinary boundaries over interdisciplinary approaches to study” and “most colleges and universities lack environmentally-oriented coursework outside of environmental studies courses” (p. 11). The report also noted that “faculty in many disciplines -- whether literature, history, economics, or biology -- need training to better understand how they can teach about the complexities of the human relationship with the natural world” (p. 11). This was followed by the *Essex Report* in 1995, which documented the work of the “Workshop on the Principles of Sustainability in Higher Education,” a small conference of environmental education professionals and experts convened as a part of the President’s Council on Sustainable Development to strategize next steps based on the Talloires Declaration and the United Nation’s Rio Conference (PCSD, 1995). The *Essex Report* acknowledged that higher education plays a critical role in shifting “the thinking, values, and actions of all individuals and institutions in their relationship with the natural environment.” The report further elucidated that, “This shift in mindset must be led by the higher education system because it prepares most of the people who develop and manage society’s institutions, *and who serve as teachers* [italics added]” (p. 3).

The *Essex Report* pointed to the trend to train environmental specialists who are equipped for jobs in industry, government, academia and environmental organizations but whose training is relevant only to “a subset of environmental problems,” and who “are not trained to deal with environmental issues in an integrated and comprehensive fashion” (p. 4). The report elaborated on this point by stating “this non-systemic orientation reinforces the compartmentalization of environmental issues and programs rather than promoting more effective, integrated approaches to solutions” (p. 5). Furthermore, the *Essex Report* noted that the education of medical students, engineers, teachers and other professionals lacked any comprehensive focus in sustainability issues, and therefore contributed to the general lack of knowledge about humanity’s reliance on natural systems for our health and survival (p. 4). Noting that the arena of sustainability study is found in the intersections between disciplines, the report called for systems thinking approaches to environmental education that stress the “interconnecting patterns and relationships” found in biocultural communities (p. 5). The *Essex Report* also calls for bringing environmental justice into the center of sustainability discussions, and shifting education towards experiential learning that emphasizes solving real world problems within the local and regional communities where universities reside (pp. 12-13). The *Essex Report* in its entirety offered a rich and detailed analysis of the role that higher education could play in fulfilling the emerging vision for a sustainable human economy and society that thrives within the bounds of the ecological systems that support it. It also described ways in which the university

system is ill-suited for the changes necessary because it is at the root of the prevalent paradigm which perpetuates many of today's unsustainable practices and beliefs. As one example, university culture tends to misunderstand and devalue the multidisciplinary approaches to education that sustainability and environmental education necessitate. In short, the *Essex Report* called for strong, decisive university leadership that will help to "reorient" higher education so that it can provide for the needs of the future, and ensure that humanity has one.

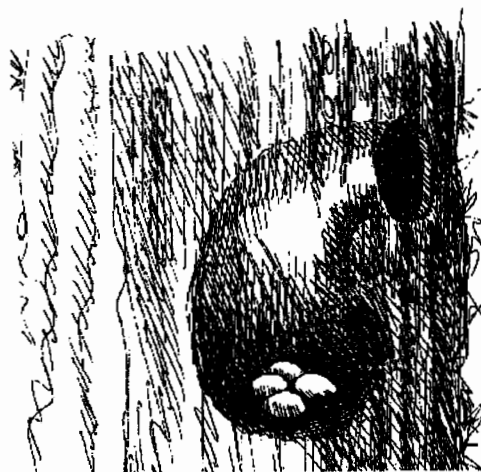
An earlier report published by the President's Council on Sustainable Development (PCSD) titled, *Education for Sustainability: An Agenda for Action* (1994), recognized the important role that both nonformal and formal education play in teaching for sustainability. It underscored the special role of higher education in training teachers and leaders, calling specifically for including sustainability education in professional teacher training programs, both pre-service and in-service. This report also noted that faculty in higher education can teach effectively about issues of sustainability only if they have themselves been well educated.

Professionals in higher education play one of the most decisive roles, that of initiating innovative programs. By finding ways to integrate interdisciplinary and systems approaches in their own undergraduate and graduate courses, they will train a new generation of teachers who will be more effective at inspiring creative thinking and sound decision-making among their students. (PCSD, 1994, chap. 5, para. 9)

In February 1997, the PCSD Task Force on Public Linkage, Dialogue, and Education published *From Classroom to Community and Beyond: Educating for a*

Sustainable Future, which again referenced the importance of educating educators about sustainability (PCSD, 1997, Expanding Professional Development section). The report, *Recommendations for Education for a Sustainable and Secure Future* (Blockstein & Green, 2003), published by the National Council for Science and the Environment, called for teacher education that will help teachers of all levels understand the relationship between environmental, economic and social factors. It also pointed to the need for educational leaders who are equipped to support teachers in their efforts to promote sustainability.

View from the Ground: U.S. Higher Education Sustainability Practices



cavity nest⁴

In reviewing these international and U.S. documents drafted to set forth an action agenda for universities and university leaders so as to best support their

⁴ From *Secrets of the Nest*, (p. 20), by J. Dunning, 1994 by Houghton Mifflin. Reprinted with permission.

efforts to develop a sustainable society, I have highlighted the call for interdisciplinary approaches to sustainability education and sustainability education for educators. I have done so in order to draw attention to the gap between vision and practice that currently exists in these areas.

While the call for universities to embrace interdisciplinary approaches to educating for sustainability is “familiar to the point of cliché,” it is also a largely unfulfilled endeavor in the United States (Association of University Leaders for a Sustainable Future, 1996). More recent studies suggest this unfortunate trend is continuing. A web-based survey of randomly selected universities and colleges in the U.S. showed that only 10% stated an interest in the natural environment in their mission statement. While 38% had environmental studies programs, only 20% of these were self-identified as multi-disciplinary (Taylor, 1999). The majority of programs addressing sustainability issues are found in policy, planning and development programs, or in programs of architecture or environmental science which address the more technical aspects of green building and ecological design (Graham, 2004). Unless students major in biology or environmental studies, most will graduate from college having developed little or no environmental literacy (McIntosh, Cacciola, Clermont, & Keniry, 2001, Executive Summary section). At the graduate level, there are some programs in natural resources and the environment, engineering and technology, public policy and business that have incorporated sustainability into their programs but few examples of programs that have brought sustainability to the forefront of the curriculum (Calder & Clugston,

2003, pp. 10-11). In teacher education programs, sustainability education is similarly absent. It has been suggested that a lack of sustainability in any discipline negatively affects how well U.S. universities and colleges are addressing this “priority of priorities” (Gabriel, 1996). Since students in teacher preparatory programs are typically required to take courses across the university’s departments, the lack of sustainability in social studies, for example, affects teacher education and education for sustainability through a cascading effect. Gabriel (1996) recommends that Education departments incorporate environmental education and sustainability into the curriculum, as well pedagogy (i.e. inquiry-based, experiential delivery methods). This raises questions about ecological literacy. Are current methods for teaching about ecology at the university level serving the needs of sustainability education? Does ecoliteracy developed from an environmental studies perspective provide future educators of sustainability with the necessary knowledge and skills for affecting cultural change?

CHAPTER III

ECOLITERACY FOR SUSTAINABILITY



cup nest¹

Perhaps one of the reasons that sustainability education has not been incorporated into the full range of academic disciplines but has remained primarily in the realm of public policy and natural science programs, is that it is associated so strongly with environmental studies. At the university level of curriculum, environmental studies tends to emphasize public policy and natural sciences and minimally include history, art and the other cultural aspects of social sciences and humanities. Indeed, it is difficult to find assessments in the literature of

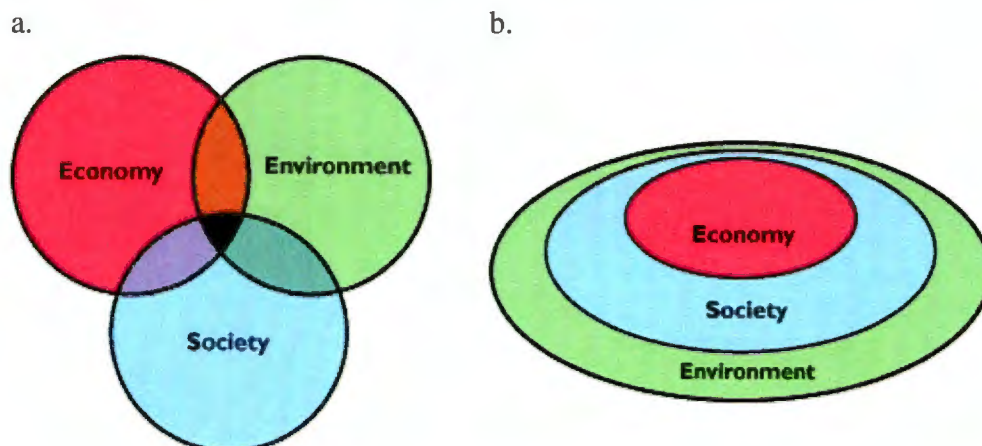
¹ From *Secrets of the Nest*, (p. 20), by J. Dunning, 1994 by Houghton Mifflin. Reprinted with permission.

sustainability initiatives that are distinguished from environmental initiatives. As I have so far used the terms “sustainability education” and “environmental education” somewhat synonymously, I would like to briefly point out some of the current debate regarding the use of these terms, and clarify how I will be using them for the duration of this work.

Many definitions for “sustainability” exist; one of the more commonly cited is from the World Commission on Environment and Development (1987), also known as the Brundtland Commission. The Commission’s report, *Our Common Future*, defines sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 43). Another definition in common use defines sustainability as the area of intersection between the environment, society and economy (Hart, 2003). This understanding of sustainability is commonly illustrated with three interlocking circles for environment, society and economy (Figure 1a). A further interpretation of this model conceptualizes the three aspects of sustainability in a nested relationship to one another, showing the economy as a subset of society, and society as a subset of the environment (Figure 1b). This second view illustrates that human economy is only a small part of society, and human society is a small part of the greater natural world. It also proposes a different understanding of the relationships between these three areas. Human social concerns are larger than

economic concerns. Environmental concerns are larger than both of these (Hart, 2003).

Figure 1. Two interpretations of a common definition of sustainability.



Note: From *What is sustainability, anyway?: An introduction to sustainability*, by M. Hart, 2003, North Andover, MA: Sustainable Measures. Copyright 2003 by Maureen Hart. Reprinted with permission.

Figure 1b offers a reinterpretation of the relationships between the economy, society and environment. It corrects for the assumption implicit in Figure 1a that suggests parts of human economy and society exist separate from the natural environment, and only some parts intersect.

One of the linguistic problems with the term sustainability is that it is not clear what is being sustained. “Environmental sustainability” is sometimes used, but this de-emphasizes the social and economic aspects of sustainability. Further confusion has resulted from linking the term to “development,” as economic development in a global context is growth-oriented (i.e., profit driven) and therefore unsustainable. Saral Sarkar, an activist and researcher working in the

Green Movement in Germany, says if we are speaking about our economy, “sustainable development or sustainable growth is not possible, unless we understand by the term ‘development’ something other than industrialization, economic growth and industrial society.” Sarkar suggests that we replace the term sustainable development with “sustainable economy or society” (Sarkar, 2001, pp. 50-51). The definition that the Ecojustice Review Dictionary (2005) gives for sustainability addresses the divergent uses for the term, noting that it is both a word that has been co-opted by corporations engaged in unsustainable practices, and a word used to describe cultural values and practices that purposefully avoid biocultural degradation.

Sustainability: a word that is being adopted by corporations in order to sustain the illusion that their practices are environmentally sustainable, when what the word really means is that their profits are sustainable; within the context of thinking about educational reforms that address ecojustice and revitalization of the commons, sustainability refers to cultural practices that do not degrade the ability of natural systems to renew themselves; the emphasis on not degrading the prospects for the future thus encompasses both cultural and natural systems. (Ecojustice Review Dictionary, 2005)

I prefer using sustainability as a shorthand version of “biocultural sustainability.”

This makes it clear what it is that needs to be sustained, namely biological ecosystems and the (human) cultural systems that have evolved and exist with them.

I also favor this expression as it marries the terms biological and cultural, encoding within the word itself a recognition that there is a link between cultural survival and biological, or ecological, survival. Indeed, regions on earth exhibiting the highest

biodiversity also show the highest levels of cultural and linguistic diversity, suggesting that the flowering of human culture can be synonymous with the flowering of the rest of the earth's species and that humans can play a beneficial, functional role in ecosystems (Oveido, Maffi & Larsen, 2000).

Definitions for environmental education have tended to emphasize learning about the physical, chemical, biological and ecological aspects of the natural environment to understand and solve environmental problems. In 1969, William Stapp provided one of the first definitions for environmental education: "Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution" (Stapp, 1969) In 1975, at a UNESCO sponsored workshop in Belgrade, Yugoslavia, a global definition for environmental education was proposed. The Belgrade Charter's definition was generally accepted by professionals in the environmental field.

The goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones (The Belgrade Charter, 1975, p. 3).

UNESCO expanded on this definition two years later in its Tbilisi Declaration which stated the goals of environmental education were to increase awareness, provide opportunities for learning, create new behaviors and improve the

environment, and explicitly stated that a goal of environmental education is “to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas” (UNESCO, 1977, section 2).

While the Tbilisi report emphasized the social and economic aspects of environmental education, these have often been overlooked in other definitions, and in implementation. For example, in 1983, the North American Association for Environmental Education (NAAEE) wrote the following definition into their constitution, which calls for an approach that develops critical thinking and problem-solving skills; this definition includes the ecological, but not the cultural and social dimensions, of environmental issues.

Environmental education is a process which promotes the analysis and understanding of environmental issues and questions as the basis for effective education, problem-solving, policy-making, and management. The purpose of environmental education is to foster the education of skilled individuals able to understand environmental problems and possessing the expertise to devise effective solutions to them. In the broader context, environmental education’s purpose is to assist in the development of citizenry conscious of the scope and complexity of current and emerging environmental problems and supportive of solutions and policies which are ecologically sound. (NAAEE, 1983, section “Position on EE”)

The economic and social aspects included in the Tbilisi Declaration’s early definition of environmental education (and dropped in many subsequent definitions and practices of environmental education) are now being brought back with discussions of sustainability. Environmental educators have challenged one another to “do a better job of explicitly including economics, equity and the environment”

in their teaching (Archie & McCrea, 1998). These discussions further blur the lines between environmental education and sustainability education.

UNESCO makes it clear that sustainability education requires an interdisciplinary approach that includes the natural sciences but extends well beyond them. In its 1997 report on sustainability education UNESCO draws attention to the importance of culture to sustainability, and therefore the significant role that the humanities and social sciences must play in effective sustainability education.

It has to be recognized that many of the world's problems, including environmental problems, are related to our ways of living, and that solutions imply transforming the social conditions of human life as well as changes in individual lifestyles. This draws attention to the economic and political structures which cause poverty and other forms of social injustice and foster unsustainable practices. It also draws attention to the need for students to learn the many processes for solving these problems through a broad and comprehensive education related not only to mastery of different subject matters, but equally to discovering real world problems of their society and the requirements for changing them. This kind of orientation would require, *inter alia*, increased attention to the humanities and social sciences in the curriculum. (UNESCO, 1997, paras. 69-70)

While a strong scientific understanding of the natural environment is seen as an important component of sustainability education, it is seen as only one component, and is not the sole focus of study. The emphasis that UNESCO places on the non-science aspects of sustainability deviates from the thinking of many environmental educators who have placed scientific investigation at the center of environmental curriculum.

The natural sciences provide important abstract knowledge of the world but, of themselves, do not contribute to the values and attitudes that must be the foundation of sustainable development. Even increased study of ecology is not sufficient to reorient education towards sustainability. Even though ecology has been described by some as the foundation discipline of environmental education, studies of the biophysical and geophysical work are a necessary -- but not sufficient -- prerequisite to understanding sustainability. The traditional primacy of nature study, and the often apolitical contexts in which it is taught, need to be balanced with the study of social sciences and humanities. Learning about the interactions of ecological processes would then be associated with market forces, cultural values, equitable decision-making, government action and the environmental impacts of human activities in a holistic interdependent manner. (UNESCO, 1997, paras. 69-70)

Another way in which sustainability education has departed from traditional environmental education is in its recognition that the human-nature relationship can be culturally, as well as biologically, restorative. Environmental education has tended to emphasize the negative ways in which people impact the natural environment, and to search for alternatives to harming the environment.

Sustainability education acknowledges that traditional ecological knowledge systems, developed by indigenous peoples worldwide, contain intricate information about ecosystems and how humans can function within them so as to leave a light ecological footprint and, in some cases, beneficially influence biodiversity.

Sustainability education recognizes that indigenous cultures serve as important contemporary models for how the human-nature relationship might be defined (Skutnabb-Kangas, Maffi & Harmon, 2003). Additionally, it recognizes that indigenous cultures model ways to educate for sustainability, as they contain and

teach the values, attitudes, and behaviors needed for present generations to survive in concert with natural systems, while not compromising future generations (Barnhardt & Kawagley, 2005).

It has been noted that civil society is well-positioned to influence cultural norms by using its moral authority to shape public perception about what is, and is not, acceptable behavior for government and businesses (Florini, 2000, pp.10-11). At the 2002 United Nation World Summit in Johannesburg, civil society grasped the important role it would play in helping prepare society to embrace the concepts of sustainability. Frustrated with the lack of action by government and industry in the decade following the 1992 U.N. Rio Conference, non-governmental organizations formed unprecedented alliances and partnerships to work on creating cultural change (Schmidt, 2002). It is likely that the process of shaping a sustainable culture will be driven by civil society strategically influencing government and business rather than top-down initiatives. For this reason, educating persons who can work as educators in nonformal settings to influence the direction of sustainability in civil society is justifiably as important as education for teachers, and educational leaders, who will work in formal schools. Few formal teacher education programs have embraced sustainability as an organizing theme for their programs in part because they are under pressure to include government mandated curriculum. However, there are some programs that are demonstrating how interdisciplinary sustainability-oriented programs, focused on training

educators and social change leaders, might be organized. My research is concerned with a few of these programs and the work they are doing.

Education that Strengthens the Human-Nature Relationship



pendulous nest²

Both sustainability education and environmental education emphasize the importance of developing an ecoliterate citizenry capable of understanding and appreciating the human-nature relationship. This is important and necessary work, especially in light of current population and immigration trends. The United Nations Populations Division reports that in 2003, 48% of the world's population lived in urban areas, and predicts that in 2007 the halfway mark will be exceeded (United Nations Department of Economic and Social Affairs's Population Division,

² From *Secrets of the Nest*, (p. 21), by J. Dunning, 1994 by Houghton Mifflin. Reprinted with permission.

2003). Furthermore, the patterns of urbanization vary in different parts of the world. According to the United Nations, those “less developed regions” are undergoing the most rapid urbanization, whereas those regions that have already been “developed” have the highest percentage of their population already located in urban areas. Overall, 61% percent of the world’s human population is expected be living in urban areas by 2030. What are the implications of this shift?

A recent report indicates that 66% of U.S. adults do not have a basic understanding of key environmental issues such as water pollution, biodiversity, hazardous waste, species extinction and nuclear waste (Coyle, 2004). More than half the U.S. workforce is employed indoors (U.S. Department of Health and Human Services, 1996, Indoor Environment section). We already spend the majority of our time in human built environments such as homes, schools, workplaces, parks, suburbs, industrial areas, roads and highways. Ninety percent of our time is spent indoors (Tibbetts, 2002). One obvious result of the change in population trends is that for more and more people, the environment with which they interact in their daily lives will become increasingly human-made and/or influenced. With urbanization increasing, we might expect that the indoor economy and urbanized landscape will also increase, leading people to spend less and less time interacting with the natural world, and more and more time interacting within predominantly human built environments. Ironically, while people are brought closer together into more densely populated urban regions, family units and social

networks are often fragmented by work, education and transportation patterns: people spend more time commuting than in the past and frequently must relocate to new communities, states or countries to follow educational and employment opportunities. Dependence on telecommunication technology for social and economic interactions also means that people are spending more time interacting with fabricated reality, less with other human beings, and even less time relating with other species or fully functioning healthy ecosystems. These trends have far reaching implications for sustainability and sustainability education.

Sustainability education strives to create understanding of how our ecology, society and economy are connected. I believe it is critical that sustainability education also help people actively restore relationships with one another, and with the ecosystems that support us. Sustainability and environmental studies are broad fields encompassing many areas of professional expertise. As mentioned previously, one important aspect of sustainability education is that of educating educators about sustainability issues and how to best teach about them. Sustainability education for educators might be seen as a specialty within sustainability education in the same way that environmental education programs (for educators) has developed as a specialization within the broader field of environmental studies. The focus of my research here, is to examine how sustainability education programs in the United States, designed to educate educators of sustainability can contribute to the broader discussion on how universities and college might approach sustainability, and to

explore how sustainability education might reinvent the way that ecoliteracy is taught, and the human-nature relationship investigated, in university-level education.

CHAPTER IV

THESIS METHODOLOGY

I conducted my research using inductive, qualitative methods of inquiry. My intent was to engage in a process that included personal reflection, community dialogue, and analysis of trends in sustainability education. Having written an undergraduate thesis in biology, which was quantitative and deductive in approach, I wanted to emerge myself in a different process, one that would allow me to explore my questions in a more intuitive manner than would be possible using quantitative research. I used interviews, rather than open-ended surveys, as one of the goals for my thesis was to develop myself as a research instrument, to develop my ability to converse with others in a more fluid style than would be required by a formal set of questions. I wanted to be able to pick up on and follow nuances that might be present in the narratives I heard.

I began my research by reflecting on my own educational experiences as an autoethnographic exercise to explore how my understanding of nature, and my relationship to the natural world, was shaped by my own educational experiences. From here, I began a string of interviews with fellow students in the Leadership in Ecology, Culture, and Learning (LECL) program at Portland State University to

gain insight into their experiences with nature, and learning about nature, and explore ideas for how the human-nature relationship might be examined most effectively and comprehensively, in a sustainability education program such as ours. I interviewed the co-directors of my program to gain insight into the program's history and development, and conducted student focus groups in which I asked students questions about the ecological component of our program and their experiences of the curriculum. In this way, I tried to move from my own personal experience as a student, to that of my fellow students as individuals, to the broader structure of our program. At each step I focused my investigation on the ecological component of our program. This was in part because many LECL students were voicing a desire to develop this aspect of the program. I wanted to record some of the richness of the discussion we were having as a community about how we might learn to understand the natural world, and the human-nature relationship from a context of sustainability. Through raising questions and generating ideas with other students, I hoped my research might help to draw out some truths that may be useful to explore for developing the ecological aspects of the LECL program, and might be informative to other programs in sustainability education as well. In this sense my research was conducted from a participant-observer perspective, and was intended to have a practical use for sustainability educators. Finally, I conducted searches for similar master's programs in the United States that are designed to educate future educators of sustainability for comparative analysis.

Autoethnographic Narrative

I began my research by reflecting on my own experiences as a student interested in sustainability, ecology and the human-nature relationship. My narrative was written in the form of poems which reflected primarily on my experience studying nature as a biology student in both undergraduate and graduate courses. I spent several months in this process of reflection. I originally intended to include my narrative alongside that of the students, but in the end decided against it. I felt that were I to do so, I might be tempted to categorize students' stories in such a way that I could tell my own. After some thought, I decided it would be best to let the other students' narratives speak apart from mine, and analyzed theirs apart from my own. However, after I had analyzed the student interviews and written up my results, I did go back and insert some of my own poetic autoethnographic work that seemed to fit with their themes, as a way of providing the reader with some insight into my perspective. Though my self-reflection was not for the most part included in this text, I do feel it was an important part of my research methodology, as it helped me to review my own thoughts and biases and so proceed with my research more conscientiously.

Comparative Analysis of Education Programs in Sustainability Education

Sustainability education master's programs were defined as programs that incorporated the three features of sustainability (ecology + culture + economy) and

combined these with a focus on educational theory and/or practice. I searched common indices, as well as directories specifically for environmental or sustainability programs, including:

- GradSchools.com. Search for Graduate Programs.
www.gradschools.com; Search Criteria: Environmental Education
- Thomson Peterson. Graduate Program Search.
<http://www.petersons.com/gradchannel>; Search Criteria: sustainable dev. + undecided (grad) + U.S.; also searched on keywords “sustainability” and “sustainability education”
- Center for Conservation Biology Network and National Council for Science and the Environment. Directory of Environmental Programs.
<http://ncseonline.org/DEP/>; Search Criteria: Environmental Education Master’s Programs; also keyword searches on “sustainability” and “sustainable”
- Education.org. Environmental Education Directory.
www.enviroeducation.com; Search Criteria: Environmental Education

In addition, I reviewed lists of universities and programs with an emphasis on sustainability or related programs of study that had been compiled by organizations and universities:

- The Association of University Leaders for a Sustainable Future.
University and College Sustainability Websites.
<http://www.ulsf.org/resources.html> ¹
- Harvard's Forum on Religion and Ecology. Resources for Educators:
Educational Institutions in the United States.
<http://environment.harvard.edu/religion/education/classresources/links.html>
- Smart Communities Network. Educational Materials/Programs:
Universities and Colleges with Degrees or Programs in Sustainable
Development. <http://www.sustainable.doe.gov/efficiency/educ/educatn3.shtml#Universities>

I browsed through these lists to try to locate programs with titles that suggested they were programs in education, with a focus in sustainability education. This was difficult, as the majority of sustainability programs I looked through did not seem to have a focus in education, and the lists for environmental education were too long for me to search through them to find those which included a strong focus in the social and economic aspects of sustainability as well as strong environmental and education components.

¹ It should be noted that since the beginning of my research, these websites have been updated. The Association of University Leaders for a Sustainable Future's website now includes a section specifically for sustainability education programs. In addition, Association for the Advancement of Sustainability in Higher Education (formerly Education for Sustainability-West) has a newly created database for tracking sustainability programs, visit: www.aashe.org. I suspect, and hope, that increased visibility for these programs will continue, rendering them easier to locate.

I also looked through graduate school reference books (i.e., Zint & Giles, 2002) and asked several career counselors who advise students on graduate schools for their advice on conducting searches. I found the same difficulties with the books I found as I did with the search engines.

In addition, I sought help in identifying programs from faculty and professionals working in the field of sustainability and graduate education. I selected contacts through recommendations from my professors at Portland State University and many of these made additional referrals, so I utilized a network selection process to identify contacts. I also attempted to locate persons who worked in non-education areas of sustainability (i.e. sustainable agriculture) and who came from a variety of geographical locations, though my contacts were more heavily representative of the western U.S. Many of those whom I contacted were unaware of the existence of the types of programs I inquired about, and most expressed an interest in finding out my results.

I hoped that I would find patterns of convergence in the programs recommended to me by those professors and professionals I contacted, and could selectively choose those programs best known for their work. However, I found that using a combined approach of personal contacts, search engines and directories, I was able to locate relatively few programs that met my criteria for master's level sustainability education programs, i.e. education and/or leadership programs with a focus on ecology, culture and economy, the three components of sustainability. I believe the reasons for this are three-fold:

1. Program terminology is inconsistent. Sustainability education is a term that is relatively new, and education programs which are including a sustainability approach are not identifying themselves as “sustainability education” programs. Most programs that fit my definition of “sustainability education” programs are not self-described with this terminology. Further, the titles of the programs vary widely, so there is not a consistent identifier used to describe them. This makes it difficult to locate such programs, or to group them with similar programs at other institutions.

2. Programs are not well publicized or networked. Of those programs I did locate, few were found in the searches I conducted using online graduate program search engines such as Peterson’s Guide, or GradSchools.com. In addition, graduate school search engines and directories don’t have selection criteria for “sustainability education.” The closest fits are “environmental education” and sometimes “sustainable development” and “human ecology.” However, none of these search terms fully described the type of program I was trying to find, so the results of these searches were largely unfruitful. The fact that search directories are not set up to search for sustainability education programs points to a lack of name recognition for this academic area of specialization. In addition, they were not often included on lists devoted specifically to environmental education or sustainability-related programs (e.g. Center for Conservation Biology Network and National Council for Science and the Environment’s Directory of Environmental Programs, Education.org’s Environmental Education Directory). This seems to

indicate that programs which emphasize cultural and educational reform towards sustainability are either not widely known among the environmental and sustainability communities in higher education institutions, or that sustainability education is not recognized as a distinct specialization within environmental education or sustainability, or both.

3. Few sustainability education programs currently exist in the United States. Of the programs I did locate, most were developed in the late 1990s or later. Sustainability education is an emerging field and it is unclear how it will be located within university systems (i.e., will it evolve out of, and with, environmental education programs or develop along a distinct course)?

Since the programs I did locate which best fit my criteria are few in number, I have listed them all here for analysis. Some of these programs were listed in the directories I reviewed, however, all but one of these programs were also identified more quickly and efficiently by contacting professors and professionals in sustainability education and asking for their assistance in identifying programs. The programs I reviewed are:

- Antioch University, M.S.² Community and Environment; Seattle, Washington;
- Eastern Michigan University, M.A. Social Foundations of Education, Concentration in Ecojustice Education; Ypsilanti, Michigan;

² M.S. = Master of Science degree, M.A. = Master of Arts degree, M.A.T. = Master of Teaching degree, Ed.D. = Doctor of Education degree, Ph.D. = Doctor of Philosophy degree.

- Lesley University's Audubon Expedition Institute, M.S. Environmental Education (also offers M.S. in Ecological Teaching and Learning); Belfast, Maine;
- New College of California North Bay Campus: M.A. Humanities & Leadership: Culture, Ecology and Sustainable Community (also offers M.A.T. in Critical Environmental and Global Literacy; Santa Rosa, California;
- Portland State University, M.A./M.S. Education with specialization in Educational Leadership and theme of Leadership in Ecology, Culture and Learning (also offers Ed. D. in Educational Leadership with a concentration in Ecology, Culture and Learning); Portland, Oregon;
- Prescott College, M.A. Environmental Studies with concentrations in Environmental Education; Sustainability Science and Practice (also offers new Ph.D. program in Education with concentration in Sustainability Education scheduled to start Fall 2005); Prescott, Arizona;
- Saint Mary-of-the-Woods College, M.A. Earth Literacy; St. Mary-of-the-Woods, Indiana.

The directory searches I conducted produced a variety of environmental and sustainability related programs, most of them with a science and technology orientation, or an environmental education approach that did not obviously address issues of social and economic justice or culture. Once I identified the seven programs above, I searched for them by name in the main directories I had used to

locate sustainability education programs. I'm including the results here (Table 1) to illustrate the difficulty one might have in locating these programs and others like them by using common search methods for graduate schools, regardless of keywords or searches attempted. Peterson's Guide is considered a standard resource for prospective graduate students searching for programs.

Table 1. *Directory Locations of Seven Sustainability Education Master's*

Programs

Directory	Results
Peterson's Guide	New College of California
	Note: Peterson's Guide did have program listings for Antioch-Seattle, Prescott, St. Mary-of-the Woods but none were called up by the keywords "sustainability" or "sustainable education." Portland State and Eastern Michigan Universities also were located in the greater directory but their specialty concentrations were not mentioned, and so could not be located by any keyword search.
GradSchools.com	Antioch - Seattle Lesley's Audubon Expedition Institute
Center for Conservation Biology Network and the National Council for Science and the Environment's Directory of Environmental Programs	Antioch - Seattle Saint Mary-of-the-Woods College
Education.org's Environmental Education Directory	Antioch - Seattle New College Prescott College Lesley's Audubon Expedition Institute

I have also included, in Appendix A, those master's programs that did not match all of my criteria for a sustainability education program, but seemed to have

a similar orientation. I believe they offer innovative approaches and philosophical insights relevant to sustainability educators exploring program design, curriculum development and strategies for sustainable pedagogy. In addition, in my research I came across several universities that have created sustainability centers or institutes intended to address sustainability education across their home campus' curriculum and/or provide trainings for educators in their local communities (see Appendix B). While in-depth analysis of these programs and initiatives is beyond the scope of my current research, I have provided brief descriptions and website links so that those with interest may explore them further. These lists are not meant to be exhaustive, but rather to point the reader to some of the interesting programs and initiatives I encountered in my research.

I collected data on each of the seven programs identified, and compared program structure, curriculum, pedagogy and philosophy. My purpose in doing so was to create a map for understanding how master's level sustainability education programs have been conceptually framed, and identify areas in which they might serve to model approaches to sustainability education that could be relevant to how higher education initiatives to promote sustainability culture are developed. I relied on program websites, catalogs and other printed materials for basic information, and when possible turned to program faculty, staff, and student contacts to help answer additional questions. I used the following questions as a framework to guide my analysis.

Program Structure

What is the range of credit hours required by programs? What is the degree awarded? Is the program self-contained or does it share faculty with other programs, departments or schools? Are programs located in already existing programs or are they brand new inventions? Do programs require or offer courses from other departments or schools?

Curriculum

Are the three aspects of sustainability: ecology, culture and economy addressed? Are they addressed equally? Are they addressed separately in coursework or in an interdisciplinary manner? How is educational theory and practice worked into the program? Is it worked into all coursework, or addressed by specific courses? How is leadership addressed? In what ways have the ethics of sustainability influenced the curriculum? How much flexibility exists for students to choose their coursework? What kinds of culminating projects or theses are required? Is nature study part of the curriculum?

Pedagogy

How is the student learning community manifested? Is community-based learning included? To what degree is it required? Are there collaborative efforts across schools, departments, programs? Do programs draw from interdisciplinary fields and faculty? Do programs network with community organizations? Do programs draw from community as well as academic sources of knowledge? How

are courses delivered? Are they residential, online, etc.? What teaching methods are used? Is hands-on learning used? How is learning assessed?

Philosophy

What sustainability philosophies are represented? What sustainability or sustainability education models have been created?

I also attempted to collect and analyze information about size and diversity of students and faculty as well as advisor to student ratio, but was unable to locate this information in several cases, and so did not include it in my analysis.

Student Interviews

Representative LECL students were chosen for individual interviews with the help of the LECL program director, Dr. Pramod Parajuli. Students were chosen to represent a cross-section of those students attracted to the LECL program in terms of age, gender, cultural background, natural science background and area of academic interest within the program. I also selected students with whom I was already familiar, and whom I knew had a strong sense of connection with the natural world in the hopes that this would allow for freer, more meaningful interviews.

Students were initially contacted in person or through email and once they agreed to participate, I sent them a formal letter explaining the study and the interview process. Each participant was given the choice of anonymity, selecting a

pseudonym, or using their real name for purposes of identification. Participants were able to choose the location of our interview, and all of the interviews were held either in my home, or in that of the participant. All interviews were tape recorded.

Five students were interviewed using a partially structured method. Each interview lasted approximately 60-90 minutes. A list of written interview questions was used to start the conversation and keep it flowing and guided. But, my questioning was loosely structured so that I could better follow the participant's thoughts. For this reason, participants were not asked each question in the same order, or in exactly the same way. For example, if a participant had already discussed some of their childhood experiences in nature, I didn't ask them to describe them to me later on. I also allowed for my own thinking to inform my interview process as the interviews progressed. One of the most effective examples of interviewing that I have read is Derrick Jensen's *Listening to the Land* (1995), in which he conducts a series of interviews exploring ideas of nature, eros and culture. What struck me as particularly effective about his method is that he viewed the interviews not only as individual conversations, but as pieces of one longer conversation. Rather than asking each person he interviewed an identically prepared set of questions, in the same order, phrased in the same way, he instead used his knowledge of each person, as well as his growing knowledge about the subject (that was informed by his previous interviews) to inform his questions. I

choose to think of my interviews in the same manner, as a part of one long, extended conversation between myself and a community of which I am a part.

Following each interview, the interview was transcribed and was sent via e-mail to the student interviewed for their review. Participants were given the opportunity to both review and modify their interviews as I wanted them to have ownership over what they said, and to be able to articulate it in print in a manner in which they were most comfortable having it presented to others. Students sent the reviewed version of their transcript to me, and it is this reviewed transcript that I analyzed. In all cases, only minor revisions (if any) were made to the original interview.

LECL Faculty Interviews

I interviewed Dilafruz Williams and Pramod Parajuli, the two co-founders and faculty of Portland State University's Leadership in Ecology, Culture and Learning program (LECL) in order to gain insight into the history of the program and the vision behind its structure. I also engaged faculty in discussing the ecology component of the program, as well as their current thoughts for the program's future development. Faculty interviews were conducted in a manner similar to the student interviews. They were partially structured interviews which were audio recorded using a tape-recorder. The faculty were able to review the written transcript of their interview and make any changes to it which they felt were necessary.

Focus Groups

Following my initial individual interviews with students, I conducted two focus groups with LECL students I had not previously interviewed. My questions for these groups asked more specific questions about how ecology was taught in the LECL curriculum and its effect and importance to students. With the help of LECL director Pramod Parajuli, I selected 19 students I had not previously interviewed from the LECL program who had taken most of the core LECL curriculum and who were most active in the program. I contacted all of these students via email inviting them to participate in one of two scheduled focus groups. Ten students were scheduled to participate in the focus groups, but three dropped out due to time constraints, and one decided against it, leaving six student participants. The focus groups were held in a meeting room in a coffee shop located at the Portland State University campus. Four students participated in the first focus group, and two students participated in the second. The focus groups were tape-recorded, and participants received transcripts and could modify their comments as desired. They were also given the choice of having their names used or remaining anonymous. Unlike the individual student interviews I held, I had not had classes with most of the students in my focus groups, and did not know them very well. Prior to the focus groups I asked students to complete a short survey describing their background and interest in LECL. I also gave them a list of

questions to reflect on prior to the focus group. I have included these in Appendices C and D.

Analysis of Individual Student Interviews

I analyzed the individual student interviews by following the protocol for categorization described in *Qualitative Research and Case Study Applications in Education* (Merriam, 1998, p. 181). Namely, I read through one interview, noting ideas and themes that participants discussed, and then made a list of categories that had presented themselves in this first interview. As I read through the subsequent interviews, I similarly made noted important themes, and matched these to the previously constructed categories or used them to create new ones. Once I had read through all of the interviews, and categorized them in this manner, I reviewed them again and noted those categories which had emerged most frequently across interviews.

The categories were:

1. Nature Immersion and Observation – directly learning from nature
2. Developing Ecoliteracy – learning about natural phenomenon and cycles
3. Biocultural Literacy – exploring how individuals and cultures structure their relationship to nature
4. Natural Economy – developing skills in sustainable living
5. Holistic Education – creating education that matches pedagogy with theory

6. Critical Pedagogy – evaluating the disconnects that can occur in education and in society
7. Value of Hypothetical Class

When reviewing each category, I looked for nuances and details that would help to best illustrate what students had shared with me, and tried to bring these out in my analysis.

Analysis of Focus Groups

I analyzed focus groups using the method described for analysis of individual student interviews. The main categories I used to catalog students comments were ecological skills, ecological knowledge, and pedagogy. I also noted areas that emerged from the conversations that I had not anticipated.

Writing as Knowing

In addition, I found that my writing process served to inform and reform my analysis. One entertaining book that has been useful to me in this regards is Judy Meloy's, *Writing the Qualitative Dissertation: Understanding by Doing* (2002). Hafiz (1999) also helped to carry me past a few writer's blocks.

You need to become a pen
In the Sun's hand.

We need for the earth to sing
Through our pores and eyes.

The body will again become restless
Until your soul paints all its beauty
Upon the sky.³

³ Hafiz, 1999, p.235

CHAPTER V

RESULTS AND ANALYSIS -- COMPARATIVE ANALYSIS OF U.S. SUSTAINABILITY EDUCATION MASTER'S PROGRAMS

Table 2 provides a brief background for each of the programs I surveyed including information on the parent institution and the history of the program's development. This is followed by comparative analysis of all seven programs in the following areas: institutional characteristics and program structure; philosophy and pedagogy; and curriculum. For the purpose of this section, I will be using the institutional name to refer to the reviewed programs. The abbreviations I use appear in parentheses after the name of the program's institution and location in Table 2. Sources of program information are noted with my references.

Of all the nests that birds can build
There are six that we can name.
So join us for a bit of fun
As we play a naming game.

Listen close to each description
And when we're done, repeat
This chorus line that lists them all
In a little rhyming beat.

CHORUS
 Ground, platform, burrow,
 Cavity, cup and pendulous
 Practical yet tasteful
 Bird nests are tremendous!

Table 2. *Program Summaries of Seven Sustainability Education Master's*

Programs

Audubon Expedition Institute, Lesley University, Belfast, Maine (AEI) ¹

MS Environmental Education

website: http://www.lesley.edu/gsass/audubon/etl_index.html

The Audubon Expedition Institute was founded in 1969 as Trailside Country School. In 1978 it became associated with the National Audubon Society and started a long term partnership with Lesley University. In recent years the Audubon Expedition Institute has become part of Lesley's Division of Environmental Studies. The Institute offers highly experiential outdoor undergraduate and graduate programs. Their programs are typically taught out of a traveling bus that creates an immersion experience for students and faculty.

Antioch University, Seattle, Washington (Antioch)

MS in Community and Environment

website: <http://www.antiochsea.edu/about/creativechange/index.html>

Antioch University was founded in 1852 by Horace Mann, an abolitionist and the founder of the public school system in the United States. Antioch University Seattle holds inclusiveness, social justice and community involvement as core institutional values. The Center for Creative Change houses four master's programs, including the Environment and Community, Management, Organizational Psychology and Whole Systems Design. Students take cross-departmental courses within the Center for Creative Change which provides a diverse learning community for students.

¹ In addition to its MS program in Environmental Education, the Audubon Expedition Institute also offers a 32 credit, distance-learning MS in Ecological Teaching and Learning for working educators. For more information, visit http://www.lesley.edu/gsass/audubon/etl_index.html.

Table 2 (continued). *Program Summaries of Seven Sustainability Education**Master's Programs***Eastern Michigan University, Ypsilanti, Michigan (EMU)
MA Social Foundations of Education, Ecojustice Concentration**website: http://www.emich.edu/coe/teach_ed/

Eastern Michigan University (EMU) has a historically strong background in educating teachers. It was founded in 1849 as one of the first teacher training institutions in the United States. EMU currently graduates the highest number of teachers in mathematics and science in the country, and is among those institutions graduating the most educational administrators. This has allowed for a high degree of specialization among education faculty. Starting in Spring 2005, students pursuing the master's degree in Social Foundations of Education will be offered the option to choose a concentration in Ecojustice Education. The program was initiated by Dr. Rebecca Martusewicz, a faculty member of EMU's Social Foundations of Education program. In addition to her professorial duties, Dr. Martusewicz is a board member of Creative Change Educational Solutions and editor for *The Ecojustice Review*.

**New College of California North Bay, Santa Rosa, California (New College)
MA Humanities & Leadership in Culture, Ecology & Sustainable Community**website: <http://www.newcollege.edu/northbay/maprogram.cfm>

New College of California was founded in 1976 as one of many schools looking to reform undergraduate education in the United States. The College emphasizes the study of human culture (through the humanities) as central to the curriculum. From the beginning the College also stressed the importance of the teacher's role as an advisor who helps students to navigate through systems of knowledge and gain competency. Lecturing was minimized, and dialogue among students and faculty emphasized. In 1981 the first master's program was offered, an MA in Poetics. New College now offers master's in several areas including Humanities and Leadership. MA Humanities & Leadership in Culture, Ecology & Sustainable Community was started in 1998.

**Portland State University, Portland, Oregon (PSU)
MA or MS Education, Educational Leadership in Ecology, Culture and Learning**website: <http://www.piecl.pdx.edu>

Founded in 1946, Portland State University is nationally known for its focus on community-based learning. PSU's School of Education began "greening" its curriculum in the 1990's at the prompting of faculty members Dilafruz Williams and Chet Bowers. Faculty met in discussion groups and explored ideas of ecological education, and its role in teacher training and educational leadership programs. In the summer of 2002, new faculty member Pramod Parajuli sponsored a symposium on Leadership for Sustainability. Following this symposium, the Leadership in Ecology, Culture and Learning master's program, housed in the Department of Educational Policy, Foundations and Administrative Studies, was started in the fall of 2002.

Table 2 (continued). *Program Summaries of Seven Sustainability Education**Master's Programs***Prescott College, Prescott, Arizona (Prescott) ²****MA Environmental Studies**website: <http://www.prescott.edu/academics/map/index.html>

Prescott College, founded in 1966, has since become known for its innovative education programs which emphasize experiential, multicultural and adventure education. Prescott College believes students should play an active role in designing their own education and is committed to educating students who contribute to their communities and the world. The MA program at Prescott was designed as a non-residential program so that students could engage in scholarly work while still remaining active in their own communities. Students at Prescott can choose to study sustainability education through the MA Environmental Studies program with a concentration in either Environmental Education or Sustainability Science and Practice.

Saint Mary-of-the-Woods College, St. Mary-of-the-Woods, Indiana (St. Mary)**MA Ecoliteracy**website: <http://www.smwc.edu/prospective/graduate/>

Saint Mary-of-the-Woods College was originally founded in 1840 by the Sisters of Providence as a Roman Catholic institution serving women. In 1991, the Sisters of Providence committed themselves to the principles of ecojustice and in 1993, the White Violet Center for Eco-Justice was founded to serve as an educational and spiritual center devoted to the recognition that all creation is interdependent. Dr. Ann Sullivan SP, the director of the White Violet Center, initiated the M.A. in Ecoliteracy program which was founded in 1998. The program is taught by faculty with backgrounds in theater, biology, economics, history, sociology, psychology, environmental studies, as well as social justice activists.

Institutional Characteristics and Program Structure

The sustainability education master's programs that I have profiled here are geographically located across the United States, but predominantly in the western states. Three are on the west coast, one in the southwest, two in the midwest and

² Prescott College also has an MA Education program which offers a sustainability education focus.

one in the northeast (Table 3). Some are in urban settings, others in rural locations. Programs vary in the number of credits required (range = 30-66cr). Five programs require less than the average, and PSU and Prescott exceed it (mean = 40cr). Most of the programs award M.A. degrees: four award M.A. degrees, two award M.S. degrees, and one (Portland State University) awards both. Prescott and Portland State University also have doctoral programs available in sustainability education.

Table 3. *Program Structure of Seven Sustainability Education Master's Programs*

Program	Institution Type	Credits	Residency Model	Degree Type³
Antioch	private	66	residential	M.S.
AEI	private	39	residential	M.S.
EMU	public	30	residential	M.A.
New College	private	36	residential	M.A.
PSU	public	45	residential	M.A./M.S.
Prescott	private	30	non-residential	M.A.
St. Mary	private	36	non-residential	M.A.

The programs range from those located in large, public institutions to small, private institutions. St. Mary-of-the-Wood College is the only religious institution

³ M.A. = Master's of Art degree, M.S. = Master's of Science degree

among them, and a women's only college, although the master's program is open to both women and men. The two programs located at public universities (PSU and EMU) have been designed as concentrations of existing master's programs in education and include cross-departmental course offerings. Antioch's program shares courses with the other master's programs housed in the Center for Creative Change. New College also draws from courses in other departments. Students studying Holistic Nutrition enroll in Baumann College, a professional school in nutrition and culinary arts. AEI is a self-contained program. Prescott and St. Mary are also self-contained because of their non-residential structure.

Five of the programs are residential, by which I mean that attending students attend regular classes at the institution housing the program, and typically live at or near the institution. Two of these residential programs hold primarily weekend courses to accommodate working students (New College and Antioch). The other residential programs hold regular day or evening courses at their home institution, and students live in the local community. AEI is a live-in residential program, where students and faculty live, eat, work, and travel together for the duration of the program. The two non-residential, distance-learning programs are both located at private institutions. These programs utilize intensive seminars at the home campus to build learning communities, and use written, phone and online communication to facilitate learning when the student is not on campus. All of the

programs seem to emphasize the importance of creating a strong learning community regardless of residency model used.

Philosophy and Pedagogy

Each of the programs demonstrated a philosophy oriented towards educating students in order to facilitate transformational societal change leading to a more just and sustainable world. Table 4 summarizes keywords and philosophical statements found in program literature and websites, as well as the pedagogy used by the program.

All of the programs require *community based learning*. At PSU community based learning is included in all core courses. Throughout their time in the AEI program students are continually engaged in community work, and their final project also engages them in community work. St. Mary and PSU provide opportunities for students to learn from community members who are brought into the classroom as visiting faculty. AEI students visit community members at their residences or workplaces. These practices are creating a “permeable” boundary between the university and local communities, helping to blend academic and community life in an approach that has been tried successfully in K-12 education (Williams & Taylor, 1999, p. 80). This allows students’ access to experts in non-academic fields such as community organizers and activists, natural builders,

scientists, policy makers, health care practitioners and others who are working in areas of sustainability.

Most of the programs I reviewed emphasized *learning communities* as an important part of the program. AEI's residential model requires students to live together as well as study together and provides a strong example of how a program might create and utilize a learning community of students. Other creative ways of forming learning communities included the use of ritual and ceremony, community potlucks and other scheduled social events, group projects, reflective assignments, weekend intensives and discussion-based courses.

Some programs, like PSU and EMU, use a standard grading system, but others, such as AEI, use grading and written narrative assessments. Prescott uses only a written narrative assessment. Student self-assessments, as well as faculty assessments, are used by AEI and Prescott.

Table 4. *Philosophy and Pedagogy of Seven Sustainability Education Master's Programs*

Program	Philosophy	Pedagogy
Antioch	transformational change; systems thinking; “facilitate positive and sustainable change in organizations, communities and the environment”	residential; intensive weekend classes; holistic; cooperative; experiential; integrates work experience with classroom life; community work with local organizations
AEI	experiential; place-based learning; learning community; nature immersion; fosters engagement in “lifelong ecological and social justice”	residential; field expedition; outdoor classroom: explore diverse communities and ecosystems; study group dynamics, conflict resolution and learning community theory; faculty are skilled outdoor leaders and content experts; students graded and participate in self-assessment, peer-assessment, and program-assessment
EMU	educational reform; ecojustice; “develop the practices and traditions in our lives that lead to a smaller ecological footprint”	residential; seminars; discussion-based format and guided activities that help students grasp essential concepts; field trips to local communities; practicum
New College	leadership; transformational change; “a more just, sacred and sustainable world”	residential; primarily weekend courses; concentration areas; learning community; strong advisor/student relationship; community based learning with local organizations
PSU	educational reform; leadership; biocultural; “creating a world that is livable, ecologically sustainable, bio-culturally diverse and socially just”	residential; concentration areas; core courses conducted as seminars; group and individual assignments; community-based learning projects required for all core courses; learning community built through scheduled social activities; grades and self-assessment
Prescott	sustainable living; human-nature relationship; “develop sustainable relationships between people and nature”	non-residential; weekend colloquia twice each term; independent study; individualized program; students send advisors a study packet every 3-4 weeks with written, formal documentation of progress; emphasis on written communication; self-assessment and written assessment by faculty; grades not awarded.
St. Mary	ecoliteracy; ecojustice; spirituality; “foster the capacity to understand the world in order to promote sustainability of the planet as a habitat for life”	non-residential; online discussions; faculty critique and assess work in writing via mail; courses team-taught by faculty from diverse backgrounds; visiting lecturers; assignments emphasize personal reflection; ceremony

Killdeer, geese and murre
Simply nest upon the ground
In a slight depression of soil or sand
Made by pushing dirt around.

CHORUS

Ground, platform, burrow,
Cavity, cup and pendulous
Practical yet tasteful
Bird nests are tremendous!

Models of Sustainability Education

Two programs had models that illustrated graphically the philosophical underpinnings for their curriculum. Terril L. Shorb, founder and coordinator of the Sustainable Community Development Program in the Adult Degree Program at Prescott College developed the Butterfly Model to illustrate the different aspects of sustainability a student should study as they move through Prescott's undergraduate Sustainable Community Development program (Figure 2). It can also be used by master's students of Environmental Studies who concentrate in Sustainable Science and Practice. The Partnership Model of Sustainability was developed by Portland State University professor Pramod Parajuli to illustrate the four areas of sustainability, as well as draw attention to the relationships between them (Figure 3).

Figure 2. Butterfly model of sustainability education developed by Terril L.

Shorb, Sustainable Community Development Program, Prescott College. Copyright

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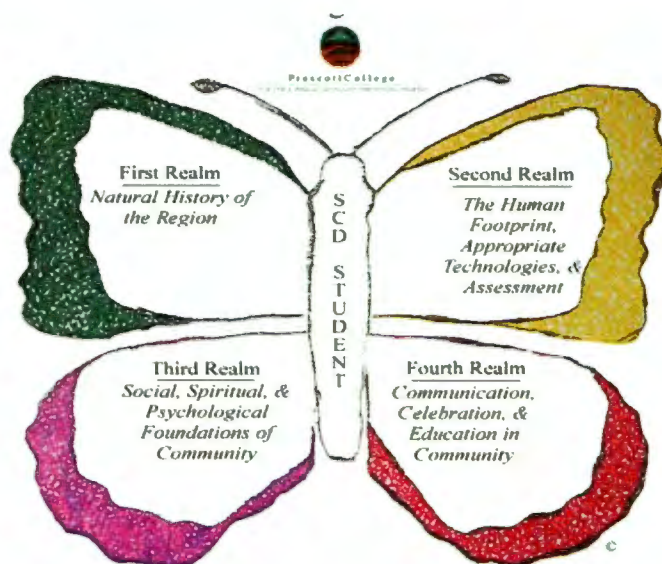
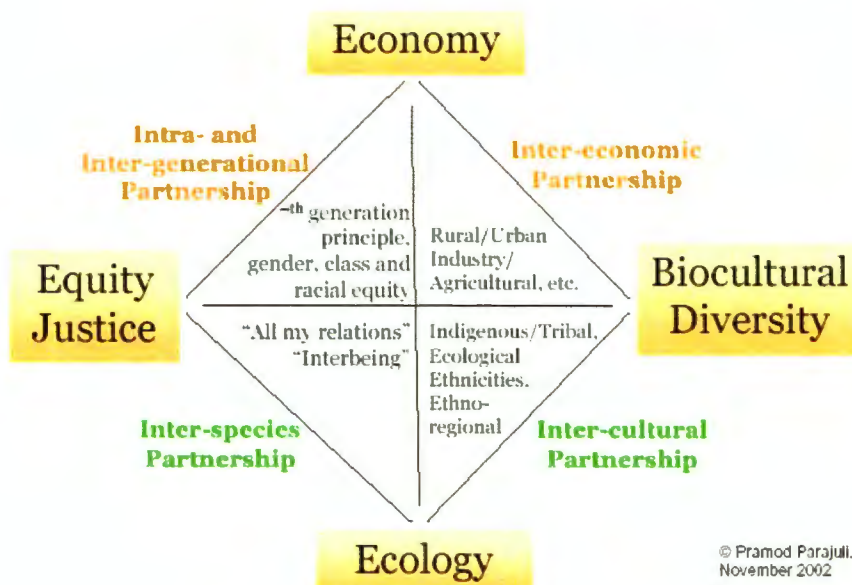


Figure 3. Partnership model of sustainability developed by Pramod Parajuli,

Portland State University. Copyright 2002. Reprinted with permission.



Terril Shorb's model describes four realms of study. The first realm covers natural history of the region; the second realm looks at the human footprint, appropriate technologies and assessment; the third realm addresses social, spiritual and psychological foundations of community; and the fourth realm explores communication, celebration and education in community. The realms are illustrated as the wings of a butterfly to draw attention to the transformative process of studying and practicing sustainability, which requires deep exploration of both inner and outer worlds.

Pramod Parajuli's model is based upon four areas of sustainability: ecology, biocultural diversity, economy, and equity/justice. Linking these four areas are relationships of sustainability: inter-species, inter-cultural, inter-economic, and intra- and inter-generational. The model was developed concurrent to the Leadership in Ecology, Culture and Learning program.

Curriculum

A complete list of course listings and requirements for all reviewed programs can be found in Appendix C.

Sustainability Content

All of the programs address the three areas of sustainability: ecology, society/culture, and economy, but each of these is not equally emphasized in the curriculum. Economics is the subject area least represented across programs.

Overall, courses tend to be taught in an interdisciplinary fashion such that two or more content areas of sustainability are woven together, and some address sustainability content as well as education or leadership. For example, St. Mary teaches a course titled Nature and Cultures which addresses both the ecological and social elements of sustainability. PSU's course on Global Political Ecology examines social, economic and ecological concerns together.

Programs with the most required content in ecology and the natural environment include Antioch, AEI, Prescott and St. Mary. Programs approach the ecological aspect of sustainability somewhat differently. Some programs aim to develop students understanding of ecological concepts like food and water cycles and nature observation, some draw from environmental studies to look at patterns of human-caused environmental disturbance, and some focus on biological knowledge relevant to sustainability such as evolution and species diversity. In addition, some programs provide opportunities for students to explore the spiritual and personal dimensions of their relationship to the natural world. With the exception of AEI, most programs do not emphasize learning time spent outdoors or directly observing nature. AEI requires students to engage in direct nature observation and learn naturalist skills such as identification of regional flora and fauna. Prescott has a number of arranged opportunities for students to work with agencies involved in wildlife conservation, restoration work and environmental education such as the Wolfberry Farm, an outdoor classroom for agroecology

undergraduates, Teton Science School in Grand Teton National Park in Wyoming, Prescott Creek's Preservation Association, Gore Range Natural Science School and Aspen Center for Environmental Studies. Some of St. Mary's core faculty are biology professors, and their curriculum includes study of genetics, evolution and principles of biodiversity.

Programs with the most content in the social and cultural realm include EMU, PSU and New College. Programs draw from diverse fields like anthropology, psychology, sociology, philosophy and education to discuss the social and cultural aspects of sustainability. Some of the words included in course titles that speak to this dimension are activism, ethics, culture, class, race, gender, justice, healing, ethnicity, consciousness, spirit, community, political, social change, ethnographic, policy, feminism, and multicultural. Courses are concerned with human rights issues related to social equity and environmental racism; the spiritual and ethic dimension of humans relationship to the natural world; cultural practices and traditions that are ecologically sustainable; political systems, governance, community organizing, activism and social change. A few examples of courses taught which address this dimension, are AEI's Culture, Spirit, and Ethics: Relationship to the Living Earth, Antioch's Global Pluralism, and New College's Core Leadership Seminar Role of Leader in Building Social Movements, and Prescott's course requirement for "social literacy."

Only Antioch has a required course that explicitly includes “economics” in its title. In none of the programs is the economy studied as a separate course. When it is addressed in a course, it is in conjunction with either social/cultural or ecological concerns or both. For example, St. Mary’s course Justice and the Earth examines economic topics like global trade, scarcity, productivity indices, and costs and benefits as they are related to the environment. PSU’s Leadership for Sustainability and Global Political Ecology courses discuss local economies and globalization.

Education/Leadership Content

Programs vary in their emphasis on education and leadership. All programs but St. Mary include courses specifically in education and/or leadership. Those with the strongest education focus are EMU, PSU, AEI, and Prescott. Those with the strongest focus on leadership theory and practice include Antioch, AEI, and New College. Some courses address only education and leadership, such as the educational research courses offered by PSU and EMU. Other courses are designed to address leadership and education in the context of sustainability. EMU’s Ecojustice and Education course examines the relationship between culture and ecology and the role that education plays in shaping cultural attitudes and behaviors that affect the environment. New College’s Core Leadership Seminars address sustainability in the context of leadership. Overall, those subject areas most likely to be taught separately in a course are ecology, education and leadership.

Research Methods

Programs vary in the research methodologies they teach to students. PSU and EMU have courses on quantitative and/or qualitative educational research methods. Prescott and New College students learn methodologies appropriate for their culminating project/thesis. It is worth pointing out that these programs are broadening the scholarly definitions of research by teaching methodologies for community-based research that are more collaborative in nature than traditional research methods. Research courses such as PSU's Collaborative Ethnographic Research Methods raise the ethical considerations of cross-cultural research and examine feminist and community research models that explore some of the power dynamics involved in academic research. The community orientation of these programs tends to foster a spirit of advocacy best aligned with participatory models of research.

Depth and Breadth

A common critique of interdisciplinary teaching is that it compromises depth while increasing breadth, and proponents of sustainability education have called for interdisciplinary education that has "lateral rigor" across disciplines as well as "vertical rigor" within disciplines (Cortese, 1999, p. 2). The programs I reviewed are interdisciplinary in nature, and provided depth of study through a variety of means. Prescott individualizes each student's course of study, providing

opportunity for students to focus in specific areas, as well as develop general competencies. Antioch, New College and PSU offer concentration areas or electives that allow students to focus on particular areas of interest. AEI faculty and students work together to select course readings and assignments that best serve the needs of students and EMU has restricted electives to provide more depth in sustainability content. All of the programs require community learning experiences and either a culminating project or thesis, ranging in credit hours from 3 (AEI and EMU) to 12 credits (Antioch).

CHAPTER VI

RESULTS AND ANALYSIS -- LECL PROGRAM

In order to provide background on Portland State University's program in Educational Leadership in Ecology, Culture and Learning (LECL), I interviewed the co-founders and main faculty of the program, Pramod Parajuli and Dilafruz Williams. Excerpts in this section from their interviews provide insight into some of the visions they have for the program, as well as where they feel the program is being challenged to grow. Unless indicated otherwise, all quotations in this section are from personal interviews I conducted with Pramod Parajuli on March 10, 2005 and with Dilafruz Williams on March 22, 2005. In this section I also draw from my own knowledge of the program as a student as well as the LECL program's website and program materials.

As a student of Pramod Parajuli and Dilafruz Williams in a cultural climate that is fairly informal, I have been accustomed to referring to them by their first names. For this reason, and because I wanted to refer to all of my study participants by either first or last name for consistency, I have chosen to primarily use first names to refer to faculty and students in the LECL program. In this section, when I am referring to professors with whom I do not have the same familiarity I have

with members of the LECL community, I have used surnames as a matter of respect.

Faculty Profiles

Dilafruz Williams was raised in urban India and as a young girl was fascinated with the few insects and plants she could find in her city landscape. After obtaining a master's degree in plant pathology she joined a Ph.D. program with the hopes of studying rice pathogens and through this means to discover a way to solve India's hunger problem. One week into her Ph.D. program and knee deep in rice paddies with no one to talk to Dilafruz soon realized that she was not intended for work in botanical research. Instead, she followed a career in education, obtaining degrees in Science and Math Education from Bombay University and teaching science and mathematics in Bombay for many years. She came to the United States to further her education, earning degrees at Harvard University and Syracuse University in Teaching and in Public Administration and Cultural Foundations of Education. Some of her research brought her back to India where she studied Gandhian school systems. In 1990, she joined the faculty of Portland State University (PSU); department of Educational Policy, Foundations and Administrative Studies (EPFA). Dilafruz's work at PSU has involved community-based learning, learning communities, civic engagement and urban education. She is a co-founder of the Environmental Middle School and is currently serving on the board of the Portland

Public Schools where she is working on food policy in the public schools. She is also serving as the current chair for the EPFA department.

Pramod Parajuli was born and raised in an intellectual, agroecologist family in the Himalayan mountains of Nepal. From an early age he had a strong love for both books and rural, traditional life. He studied Education and Law at Tribhuvan University in Kathmandu, Nepal. In 1980, Pramod assumed the role of founding principal for a private college he established with supporting faculty and friends. Bandipur College was his first attempt to realize his dream of a school for teaching rural livelihood, but due to the unwelcoming political climate the school soon closed. Pramod then went to Stanford University, on the advice of an American friend, and studied Anthropology and International Development Education. With funds from a MacArthur grant he researched agroecology in the Himalayan landscape and established a multipurpose family farm in Chitwan, Nepal. Following Stanford he taught at Syracuse University where he created the Syracuse Social Movements Initiative. Later, he taught with the Boston-based International Honors Program, traveling with students to Mexico, Tanzania, New Zealand, England and Washington, DC. He came to Portland State University in 2001 with the interdisciplinary University Studies program and in 2002 was hired to serve as faculty with the EPFA department as the director of the Leadership in Ecology, Culture and Leadership (LECL) program. Pramod currently serves on the boards of

Oregon Tilth and PSU's student-run Food for Thought Café and is involved in Oregon's taskforce on sustainability education.

Eagle, heron and great horned owl
 All had a revelation.
 Their platform nests are made of sticks
 Piled high for elevation.

CHORUS
 Ground, platform, burrow,
 Cavity, cup and pendulous
 Practical yet tasteful
 Bird nests are tremendous!

Early Beginnings of LECL

In 1990, when Dilafruz Williams joined the faculty of the Educational Policy, Foundations and Administrative Studies Department at PSU she began “greening the curriculum” of the department by bringing articles written by intellectuals such as Mahatma Gandhi and Wendell Berry into her Philosophy of Education classes. In this way she exposed her students, and her colleagues, to an ecological and social justice philosophy that was new to many in the educational field.

It was quite fascinating to see the reaction of students, many of whom began to embrace it, actually. This was the first time in their educational program they had had exposure to something very different than the regular rhetoric and discourse of urban education or preparation programs.

Initially, Dilafruz “felt very alone trying to do this work,” but in the early 1990’s Chet Bowers from University of Oregon’s Department of Education joined the Curriculum and Instruction faculty at PSU’s School of Education.

Bowers shared Williams’ deep commitment to the environment and social justice. Dilafruz talked about how there was a natural fit between their philosophies for education, and also their professional areas of expertise. She described Bowers as a “very deep intellectual with not as much concrete experience of the real world of teachers and principals and schools,” which was “wonderful” because it balanced her own “ground level perspective and really deep gut level experience of what it means to work in the schools with teachers.”

Dilafruz explained that they began to “embed the green curriculum” into the regular teacher education program (Curriculum and Instruction), by taking existing courses like Curriculum and Culture, Curriculum Instruction and Introduction to Education and reorienting their curriculum to include discussions of ecology and sustainability. According to Bowers, this strategy was essential.

As the School of Education was (and still is) facing budget cuts, the strategy of updating the content of existing courses in ways that took into account cultural issues relating to the ecological crisis was absolutely essential. If the approach had been that of adding new courses and hiring additional faculty, the entire effort would have failed. By taking existing courses and showing how the issues and theoretical foundations in such areas as learning theory, curriculum, and classroom communication could be based on understanding how individuals are nested in culture, and culture is nested in natural systems, we demonstrated that a cultural approach to environmental education must start with the reconceptualization of the dominant paradigm that underlies mainstream education. (Bowers, 1999)

They began to hold brown bag lunches with faculty from the entire School of Education on Fridays and discuss readings that brought in an environmental perspective to education. The meetings were well attended by faculty including Karen Noordhoff, Ron Narode, Rolla Lewis, Bill Greenfield, Emily de la Cruz, Tom Chenoweth, Dannelle Stevens, Joan Strouse, and Carol Mack (then Curriculum and Instruction Department Chair) and Bob Everhart (then Dean of the School of Education). By including other faculty, and looking at ways to integrate ideas of culture and ecology into existing curriculum they were able to develop specializations within the existing Curriculum and Instruction program in Education, Culture and Ecology (master's level) and Community and Environmental Renewal (doctora level). Since initially most faculty did not feel prepared to integrate this material into their courses, another strategy that was employed was to bring in visiting faculty with funds available for summer sessions.

In her interview, Dilafruz mentioned that many of the courses in Curriculum and Instruction which had been "greened" by Chet Bowers have since reverted to more standardized curriculum since he is no longer a faculty member on staff.¹ I share this detail in part because it provides some insight into the structural form of the LECL program. It also has relevance to those who may be interested in starting similar programs within other institutions. I believe this story illustrates the

¹ For more information, and Dr. Bower's perspective on the development of these initiatives, refer to C. A. Bowers (1999), "Changing the Dominant Paradigm: Cultural Perspective in Education" in G. A. Smith and D. R. Williams (Eds.), *Ecological Education in Action*, State University of New York Press: New York.

importance of institutionalizing change into program structures whenever it is possible to do so, so that they will be more resilient in the long-term and less dependent on the support of individual faculty members. On the other hand, it also illustrates the importance of looking at the long-term rather than short-term gains that may be achieved by starting initiatives in new areas like sustainability. The early work that Williams and Bowers were able to accomplish drew in a large number of faculty and administrators from the School of Education. It initiated dialogues among them and introduced them to ways of thinking about the cultural and natural systems within which education is embedded in a way that likely had long term effects on the culture of the School of Education. In Pramod's words, "Chet was perhaps a decade ahead of his time, however he planted a seed."

About a year after Chet Bowers retired, Pramod Parajuli was hired at PSU to teach for University Studies, an interdisciplinary general education program nationally known for its focus on building learning communities and incorporating community-based learning into courses. Pramod joked that because of his "ecological and kind of soft technology orientation" he was assigned to teach a course called Cyborg Millenium. At this point, Dilafruz and Pramod met and realized that they had common interests. As Dilafruz said, "I was just delighted because when I became a full professor I'd always wanted to start a center for non-violence and ecology, or ecological sustainability here. So when Pramod showed up it was just a great fit."

They began to work together to discuss possibilities for a sustainability education program, and partnered together in the summer of 2002 to produce the Summer Institute on Leadership for Sustainability which was intended to be a trial run to gauge interest for a sustainability education master's program. The institute was well attended and Bill Greenfield, then Chair of the Educational Policy, Foundations, and Administrative Studies (EPFA) Department, committed to funding a faculty position for Pramod so that they could begin the LECL specialization. Since it would have taken about two years before approval was granted for a new independent program, the directors chose instead to use the pre-existing structure of the EPFA department's Educational Leadership program as a base upon which to add four required courses and electives that would bring in an ecology and culture perspective.²

Development of LECL Program Structure

It is interesting to note that the departmental placement of the LECL program was also due in large part to the faculty positions held by Pramod and Dilafruz. The original efforts to "green" the Education curriculum occurred in the Curriculum and Instruction Department because this was the department in which Chet Bowers was located. Dilafruz mentioned that part of the reason the LECL

² As a point of clarification, LECL is technically defined as a theme of the specialization Educational Leadership offered by the EPFA department; graduating students receive an MA/MS in Education. I refer to LECL throughout this document as a "program" in an effort to minimize lengthy descriptions, but in an official sense it is not a program as it is nested within the Educational Leadership specialization of the Education master's degree offered by Portland State University.

program was placed in EPFA is because she is situated in EPFA and Pramod's background best fit within the EPFA department as he did not have the necessary background to be placed in the teacher licensure program. She also mentioned that because of state requirements it would have been very difficult to weave the LECL classes into Curriculum and Instruction because the teacher licensure program must be very structured.

When Pramod and Dilafruz first envisioned the structure for the LECL program they utilized the same strategy of building onto an existing program and creating a specialization that had been successfully used before. This afforded them to side step the two-year approval process required to initiate a new master's program. But, instead of changing the curriculum of existing courses as had previously been done, Pramod developed new courses that were added to the existing curriculum. In this way, Pramod felt he has been "a little more successful in avoiding ... turf problems" that may have arisen if he had attempted to modify existing curriculum.

Another important point that is raised in this story of LECL's early beginnings that may be of use to others, is that Dilafruz Williams and Chet Bowers shared a common interest but as faculty brought very different academic and personal experiences into the program. Pramod and Dilafruz similarly balance each other in both professional areas of interest and in background. Both have degrees in education, but Pramod's background is in anthropology, while Dilafruz's is in

science. Additionally, while his scholarship is concerned with a global perspective of sustainability, she has scholarly and practical experience with service learning, public schools, and urban education. In both partnerships, there was also a balance of genders. Dilafruz and Pramod bring their personal experience of being from the Global South but Dilafruz is from an urban environment, and Pramod from a rural one.

Diversity of faculty and students was a goal established prior to the start of the program. Pramod's original vision for LECL was to bring together a diverse mix of students who represented community activists, formal educators, scholars and also international students. The intent was to provide this diverse group with tools and content that would prepare them to work as educators for social change through the channels of either formal or informal education, and to build a learning community that offered students rich insights into diverse points of view regarding sustainability, social change, and education.

In Pramod's interview he mentioned that professors in other departments often ask him why the program is not housed in Geography or another discipline. He explained the reasoning for placing a sustainability program in a School of Education by discussing the intent of the LECL program.

We are talking about preparing a new generation of teachers and educators. That's where the key is. That's why we are here. But, what we are saying is they are not educators narrowly in the traditional, classroom sense. They are actually social organizers and leaders. So we will actually combine the two – two groups of people. So that the educators can see the wider social framework of social

change that they need to be addressing, rather than just focusing on teaching this child or that child. And also the social change people, the leaders of NGO's and non-profits, also know that actually social change is a very pedagogical process. So that's my intention - to bring these two populations together and develop a new synergy. That's why the preamble to LECL states: to prepare future educators and leaders who will create a society that is livable, ecologically sustainable, bioculturally diverse and socially just. So the idea is when both of them are in the same class, social change actors are learning a lot about the role of an educator, but at the same time, the educators are learning a lot about organizing, social change, how to work with the larger system. So hopefully it is beneficial to both and we are expanding both realms. So basically, this is the crux of the LECL curriculum: social change as a pedagogical act and pedagogical act as a social change act. And that's why we are uniquely located here, and we need to pursue this and articulate it further.

A unique combination of circumstance, chance and planning determined the development of LECL's program structure, including where it is situated within its home institution. In addition, Pramod and Dilafruz both pointed out that timing was an important factor in the early success of the program: the cultural and political climate at PSU and the larger Portland community was much more receptive to sustainability ideas in 2002 than it was in the early 1990's.

Vision for LECL

During our interviews Dilafruz and Pramod shared with me their visions for the LECL program. When I asked Pramod to share with me his earliest thinking about the LECL program, he told me of his idea for creating a sustainability program or school began when he was a young man back in Nepal.

This has been my lifelong dream to tell you the truth. Even while I was in Nepal ... I was always thinking about establishing a rural university where all kinds of rural livelihoods could be taught. This university I dreamt would be the link between school and community ... from early on I realized that our education system, whether it is in Nepal or here in the U.S. (as I found out later on) builds the “tree of knowledge” but what we have lost is the “tree of life.”

By speaking about a tree of knowledge and a tree of life, Pramod consciously chose to draw from both eastern and western written traditions like those of Europe and his own ancient Sanskritic tradition.

I like to use that [tree] metaphor. Basically that starts way long back in European enlightenment, and also reverberates in all written traditions ... as people like David Abram have shown ...once you begin to codify your thought and experience in languages, whichever language it is, once you begin to print it something is lost. Because the life that begins to be represented by some concepts and letters gradually become just that and the resiliency of life as we live it is lost in translation. So that is what has happened. All the university system and all the education system ... we built up the tree of knowledge, and then unfortunately, we lost the tree of life. Now, I am realizing that was my bug, a field of deep questioning and discomfort. I probably had that bug from ... childhood.

To illustrate his frustrations with modern education, Pramod shared a story from his college days in Nepal when he was listening to an American professor give a lecture about cows. The professor was using a diagram of a Jersey cow in America to explain his lesson. Pramod recalled that they were in a state-of-the art modern building placed on a paddy field that originally belonged to Katmandhu Valley peasants. He recalls with laughter, “While the professor was talking about the cow grazing outside my window I could actually touch a cow grazing outside my window.” Pramod remembered bringing this to his professor’s attention.

[I said] Professor, what are you talking about? If you are really talking about a cow, let's talk about this Nepali cow which I can touch right here, it's grazing right outside our classroom. Why are you using this photograph of a Jersey cow from America [of] which none of us have any idea?

Pramod recalled that this was his earliest recollection of “the irrelevance of mainstream education.” It prompted him to examine how one might develop scholarly, written knowledge while still remaining connected to life.

His experiences working and traveling within peasant and indigenous communities have given him insights into the “tree of life” that he draws from in his own thinking about education.

Working with tribal communities in India and Nepal and traveling across the world, I could get a sense that there can be tree of life without succumbing to the tree of knowledge. Then you can begin to actually deconstruct and question the whole build-up of this knowledge industry, from kindergarten to higher education.

I questioned Pramod about how it is that he is situated within the educational system he critiques, and why he did not choose an alternative path of living in his own village and remaining more closely connected to this tree of life. He answered that it is this contradiction on which he thrives.

I have not given up that we can still change the tree of knowledge and make it closer and closer to the tree of life and hopefully dissolve the gap between the two Once, David Abram was asked: shouldn't we abandon language because it has already lost so much of the real life experience in translation?” His answer was very informative for me. Abram answers and I will paraphrase, “No we cannot abandon language, but we can use the language to actually reclaim what it used to be.” So I am also one of those who explores contradictions. I am trying to see how could we use the university system to reclaim that tree of life, but knowing full well that it is full of contradictions. But, I could not do otherwise, either, because I

am also brought up more on the tradition of the tree of knowledge. Although I grew up in the middle of a sustainable, multi-purpose life in the Himalayan foothills of Nepal, perhaps I spent twelve hours out of 24 hours in a day on books and thinking and writing.... That's why I am here (laughing), I rejoice [in] studying and swimming in the ocean of ideas.

When Pramod and Dilafruz first met to discuss the possibility of creating the LECL program, they drew from Pramod's early visions of a school that explored traditional living and Dilafruz's long-held dream of creating a center at Portland State University devoted to "non-violence and ecology, or ecological sustainability." The structure of the LECL program has sprung from these individual, and shared dreams and from the existing structures available within the EPFA department at PSU.

Developing the LECL Curriculum

In order to develop a well-rounded curriculum, Pramod used the LECL Partnership Model of Sustainability that he developed in 2002 (Figure 3). He intentionally designed the four core LECL courses to cover ecology, biocultural diversity, economy and equity. In addition, he considered how inter-species, inter-cultural, inter-economic and inter- and intra-generational relationships would inform the curriculum. Pramod explained that course Leadership for Sustainability is meant to explain the whole Partnership Model of Sustainability and looks at how to build social, economic and natural capital. Global Political Ecology covers inter-generational and intra-generational equity and inter-economic partnerships.

Ecological and Cultural Foundations of Learning covers inter-species and inter-cultural relationships. Collaborative Ethnographic Research Methods is also concerned with the entire model and is meant to “link the tree of knowledge and the tree of life in the realm of knowledge production.” Pramod explained what he meant by this by referring again to the trees of knowledge and life.

Basically, in this course, students interrogate the tree of knowledge on behalf of the tree of life. And the research process that we are used to, all this kind of standard methodologies are so implicit in creating a very privileged system of knowledge that goes to the intellectuals and gets published in certain sections in a language that is so obscure and has no relevance to the people that we have extracted from. The data was drawn from them but the product is somewhere else. And that corresponds ... exactly with how the global North and South are intertwined in an uneven economic transaction. Raw material is with the South, process is with the North; better quality products are consumed in the North and the inferior quality is sent back to the global South. There is exactly the same pattern in the knowledge industry. So the idea is how to democratize knowledge industry so that the people in the global South can begin to own that knowledge and use it for their own use and empowerment. So [we ask] what’s the role of the researcher in the middle? ... We go into new methodological schools such as feminist methodologies, the Gaian methodologies, participatory action research, autoethnography, autopoetics, focus groups and ... ethnography that incorporates performativity, storytelling.

These four courses provide the foundational base of the LECL theme. Students then take electives and create a thesis or project in a concentration area of their choosing. Students interested in combining an international experience with their LECL program can choose to participate in an international internship.

LECL Challenges and Strengths

As a new program LECL has its share of challenges as well as great new ideas for how to continue to develop. Dilafruz and Pramod shared some of their thoughts on both the challenges and strengths of LECL.

Challenges

Some of the current challenges for the LECL program articulated by Pramod and Dilafruz are that they are short-staffed and over-burdened with responsibilities. Pramod is responsible for teaching all four of the core LECL classes as well as directing the program. Dilafruz is chair of the EPFA department in addition to being a faculty member of the LECL program. She is also serving on the Portland Public School Board. Dilafruz also noted regretfully that she has not often had her advisees as students since she has been unable to teach many classes due to her busy schedule. The classes she does teach are not part of the LECL core, but are electives.

Dilafruz felt that a critical question for the program right now is to articulate the types of career paths that students might follow with a LECL degree, and prepare to provide them with the necessary skill sets for success in these areas. She discussed that LECL's strength is in providing breadth and a global perspective on sustainability, but that the program needs to be careful to provide students with tangible skills they can translate into future careers. Pramod was more optimistic in

this sense, perhaps because he works more closely with the majority of LECL students. From his perspective LECL students are naturally figuring out how to satisfy their needs and are finding courses to take as electives which will strengthen their skill base. He provided several examples of students whom have taken advantage of opportunities at Portland State to gain additional professional certificates (e.g. some students are becoming certified in Geographic Information and in teaching) or have combined the LECL core courses with another master's degree to pursue dual degrees.

Strengths

Dilafroz felt that one of LECL's strengths is its multidisciplinary focus. Pramod mentioned that students have networked among each other, recruiting other like-minded students and in this way the program has grown remarkably in its first few years and the quality of students has been maintained. He also felt that the strength of the program was in its unique approach to addressing issues of sustainability from a relational model that was very personal as well as community-oriented. Pramod voiced that LECL's focus on transformative learning is a unique aspect of the program that creates an openness and optimism in students which allows them to pursue their ideals. Pramod referred to several students in the program who are pursuing divergent areas: one is looking at developing learning communities in businesses, another is interested in creating local, seasonal menus for restaurants. I discussed with Pramod how this approach to sustainability

education is somewhat unique, and unlike the approach taken in programs of environmental policy, for example, which prepare students for more specific career paths. Pramod explained the reasoning behind this approach by referring to a Chinese character for learning which utilizes two symbols; one shows a person in a doorway, the second depicts a bird flying away.

PP: I mean ... there is ... [that] Chinese idea about learning ... the last end of the word is the bird flying out (laughing) see, so that is also the kind of openness I really want to create among our graduates ... not this kind of a rigid framework. Ok, now you are a geography teacher for 8th grade and I prepare you for it. Not like that, much more expansive. And one could go towards arts, go towards health and education ... they'd need more training of course, but opening up. That's the sense. So I do not have a deterministic model about it and I am not anxious for not being deterministic. That's the difference.

AK: Hearing you describe the LECL program like that, and having heard you describe it in the past, it seems to me that the vision you have for LECL is like a doorway. It helps to frame student's thinking, but also helps to frame the totality of who they are, it helps focus their energy. And it is also like a doorway because it helps move them from one place to another, from where they are now, to where they dream of being. It seems your vision of LECL is that it is a program that is transformative for students.

PP: Yes, exactly.

Another strength that Pramod and I discussed is that LECL has been able to bridge the gap between community knowledge and academic knowledge by bringing in community experts to teach courses in naturalist skills and permaculture and indigenous knowledge systems. As Pramod sees it, this is an effort to bring the tree of knowledge to the tree of life, and vice versa.

We are using ... the [faculty] positions we have as a legitimizer. So it's in a sense bringing the tree of life into the tree of knowledge and taking some tree of knowledge to the tree of life, too. Because what has happened in the hierarchy of knowledge - the historical pattern - is that the tree of life has been rendered as folklore, and nonsense and commonsense, and everybody treats it as if that's not knowledge. And we are saying, no. Your knowledge is as valid. So it's a double process. We are hopefully breaking the barrier between the tree of life and the tree of knowledge. But definitely my position is in the tree of knowledge industry. But with the intention of bringing the tree of life into it, and bringing some validation, respect, and visibility for the tree of life.

New and Potential Initiatives

Currently, Pramod is speaking with faculty in PSU's Hatfield School of Government to explore the possibility of establishing a master's program in public administration, non-profit management or executive leadership which would utilize the four core LECL courses, offering a LECL specialization to students interested in educating for sustainability by working in the non-profit or social sector rather than in formal education. He hopes to have this in place in 2006. Dilafruz envisions creating a national sustainability education center at LECL that hires alumni to help bring sustainability education into schools and communities across the United States.

Pramod also mentioned that he and Dilafruz are considering expanding the LECL program and requiring more credits for the degree. I asked Pramod if he would consider offering a certificate program to students interested in taking the four core LECL courses alone. He said he would consider offering a certificate, and

also that it might be a good idea to offer summer or weekend courses for students who had limited time or finances to devote to their studies.

Developing the Ecology Component of LECL

Partly in response to students' requests for more ecology based courses, the LECL program has recently added elective courses in Permaculture, Urban Farming and Nature Awareness. I discussed the ecology component of the LECL curriculum with Pramod and Dilafruz.

I asked Dilafruz how her visions for "ecological education" described in her book *Ecological Education in Action* (Smith & Williams, 1999) have influenced her vision for the LECL program. She spoke about her work at the Environmental Middle School and how important she felt it was to bring in ideas of economics and culture into environmental discourse, as well as to examine community, i.e. how do you form communities, or local economies. She asserted that spending time in nature is an important part of sustainability education.

I'm of a firm belief that you have to have experiences with nature otherwise you just end up with critique ... if children haven't been in the woods and they don't sit quietly and they don't grasp the meaning of their connection with the world and with nature -- I didn't think simply talking about [critiques of modernity] would make any sense to them because they wouldn't have the other language. They wouldn't have that other way of being, the other way of knowing. So I do believe that you have to provide that experience.

When I asked Dilafruz if she thought this was relevant to higher education, she said, “Absolutely. It’s absolutely relevant,” but she clarified that providing this is a challenge because of accreditation requirements, “we can’t simply just go on nature walks and go out and just sit and write poems and all that. We have to engage intellectually, academically with our students.” Then, to explain what she meant, Dilafruz discussed a new 1 credit Urban Farm class she was in the process of planning to explain what she meant.

Even for the Urban Farm [course], I’m going to have a book that I’ll have students read and connect their experience with that because I can’t give graduate credit without having students do that, unless it’s just a workshop, or a practicum. You can have some credits for that sort of thing but you can’t have a lot of those credits.

Dilafruz also discussed how she believes studying science is just as important to sustainability as studying anthropology or economics. Her own background in science has been critical for her understanding of sustainability.

And I would say that the science piece is just as important. I would say that my own love for botany and biology undergirds a lot of why I believe in this work. I mean if I were not fascinated by hummingbirds then I don’t know how I could teach about hummingbirds. Or if I didn’t know much about flowers and gardening and just the aesthetics of it all I don’t know how I would teach. So I would like to think the nature and science piece is part of it.

Dilafruz and I then conversed about how ecology might best be fit into the LECL curriculum. Dilafruz suggested having two tracks for the four LECL core courses, so that there is a “parallel track on the outdoors and nature.” She suggested that experiential nature learning be built into the required community-based learning

(CBL) experiences that are a required part of all four of the LECL courses. Each CBL requires students to spend 30 hours engaged in a community project. Dilafruz thought that these CBL hours could be used to provide naturalist trainings or other experientially based nature education.

When we examined the Partnership Model of Sustainability, I asked Pramod if he could define for me what he meant by ecology. He responded by saying that the other three corners of the model are concerned with the human realm and that nature is present to a lesser degree. For example, it comes into the economy in the sense of biomass and “an economic model of consumers and producers and rural and urban and industry and agriculture.” The ecology component, he remarked, is meant to bring attention to the more than human world. This focus on “inter-species partnership” is a central and unique part of the LECL philosophy according to Pramod. He explained what he meant by ecology in more detail when I prompted him again.

The relational aspect of the human community with the more than human community is the central theme. Understanding and appreciating that umbilical cord would be my definition of ecology. My idea about ecology would not just be counting or identifying species. My idea would be to unfold the whole real history of relationships, the complexity of relationships among species, including humans. That’s the kind of ecology I want.

Pramod referred to Gary Paul Nabhan’s work on pollinators to explain that what he considers to be ecology is not simply scientific investigation of the natural world, it is the recognition and study of the ways that all life is interconnected.

And in that sense the best person I have identified so far is Gary Nabhan. Being an ethno-biologist himself, he's saying that one of the drawback of ethnobiologists is that they are still occupied by the idea of cataloguing, specifying, and naming them. But he urges us to see that what are in danger of extinction are actually the relationships. That the bee, the pollinator, is in relationship with the flower and the diversity ... the whole relationship is in crisis And unfortunately, according to Gary Nabhan, I agree that the ethnobiologists and biologists have not been looking at the relationship. They are more focused on 'how many types of butterflies are there?' And that's what I mean by inter-species, the relational unfolding, complexity in [an] ecosystem between who knows, five hundred elements or five thousand elements working together to make something happen That's the story I want to unfold.

I asked Pramod to explain why this understanding of ecology is relevant to sustainability and sustainability education.

Pramod responded by saying that sustainability necessitates a worldview that helps us to "identify ourselves and find ourselves in that wave of cosmic relationships, not separate from it." He explained that this is connected to his views on ecological ethnicity, a group identity that is based on where people live, not blood-based ethnic identity.

It's not necessarily blood that makes you an ethnic group, or even your language, but actually your ecological connection with a particular place, and your form of harvesting from nature, what and how you produce in collaboration with the more than human world...is more a signifier of who we are than our race So my critique of the anthropocentric social science on ethnicity actually resembles Gary Nabhan's critique of biologists and ethnobiologists in terms of reductionism. So that's what I mean by the unfolding of the complexity of relationships on any ecological event actually, how do we understand all that together rather than just a piece of it.

Pramod clarified how ecology taught from a sustainability perspective was different from that taught by a science perspective, by saying that it was not as reductionistic as science, because it looked at everything as a network or web. As an example he discussed the Ecoliteracy Project in Berkeley that studies food cycles by looking at gardens.

So one example, the best illustration of it, has been done in the food cycles and networks, how they study the food cycle in the Ecoliteracy Project at Berkeley, that Fritjof Capra is working on...what he is saying is ... that this zucchini is at a particular point in the garden, that the garden is within a schoolyard, or a farm, then that farm is within a river system (watershed), that river system is within a mountain system, and a valley, and it is within a Bay area, and the Bay area is part of a Pacific Coast and the Pacific coast in North American...you see? So that's what we mean by it. We want to show the whole circle of relationships and nested systems. That's what it is. That doesn't ignore the particularities of the zucchini plant or the fruit with the bug in it, but it doesn't only remain there. It actually looks into the location, into the whole nested system and goes to the cosmos, the universe. But, I will say at least within that kind of local-regional and global system framework, I would think that everybody should know their location. What kind of sunlight am I getting, what kinds of stars are pulling my plants, what kind of soil is formed, what kind of volcano is there, you know? It's all those things that made the zucchini possible, otherwise it wasn't possible. Remember there is the saying, a whole is always bigger than the sum of its parts. We are trying to grasp that "bigger," whatever that might be.

When I asked him how the LECL program manifested the ecology component in terms of course content Pramod mentioned that he is beginning to focus more attention on this part of the program now.

He also mentioned that students study Fritjof Capra's conceptual framework for understanding whole systems and in one of their assignments are asked to

explore their “ecological self” and assess their own ecological connections to the larger natural world. Readings by authors like Satish Kumar who speak to the hearts of students are also included in his courses in order to develop students natural affinity and love for nature.

Following David Sobel and other educators, we are recognizing that we cannot save something (let us say the earth) until and unless we love it. So before telling people about this crisis and that crisis, in ecology, we have to cultivate love towards the earth. So as sustainability educators, we have tasks ahead of us. How can we cultivate love towards the earth (the human and the more than human unfolding) among our LECL community? Then how can each of us develop such learning and teaching tools that we can cultivate love towards earth among ... youth and adults that we work with? ... We have just begun to scratch the surface in this area.

I was curious to know how Pramod might respond to some of the comments students voiced in their interviews with me regarding how they wanted to learn about nature.

I reflected to Pramod that in the individual interviews I had with students the overwhelming feedback I received when I asked them how they wanted to learn about nature and the human-nature relationship was that they wanted to spend time outdoors studying nature directly. I mentioned that the only place to get this direct contact with nature was in a biology or science class at the university level, and that the underlying cultural perspective is fundamentally different from that which Pramod had been speaking about. Pramod responded by saying he thought it would be a good idea to develop a second part to the Ecological and Cultural Foundations of Learning course that would explore ecology in “the classroom setting, garden

setting and the natural setting.” He suggested adding a fifth LECL core course that would combine Sustainability Education with learning gardens. Pramod also mentioned that he has been exploring the possibilities of developing an international program in Belize to provide students with an opportunity to experience a different ecosystem.

I also asked Pramod how a class that focused on the human-nature relationship taught from a sustainability perspective might differ from one taught from an environmental policy approach. The difference Pramod articulated is that a sustainability course would be concerned with developing students abilities to develop livelihoods and lifestyles that are sustainable, and would avoid “training bureaucrats how to take stock of certain information and make a wise policy.” He says that the difference is that “we are cultivating a sense of a much more creative, freer approach to life. Rather than how to become a good bureaucrat, we are saying you can be a good citizen and good mother and good neighbor and good farmer and good business person, all at the same time. So we have opened up that possibility.” He added that in this sense a sustainability approach to examining the human-nature relationship is both more unpredictable and more open to possibilities.

While Dilafruz was interested in developing students’ communication and presentation skills as well as skills in a specific area of ecological teaching, Pramod was interested in developing students’ ability to not only think critically, but also to think creatively. He felt that since we live at a time where information is readily

accessible, students must learn skills to process and make use of the information around them. “One skill,” he said, “could be how to use the information that is already available and how to make a new meaning, transcending what is already available.”

Every problem can be turned into a solution. And moreover, if we are wise a tremendous change can be triggered into a system with minimalist intervention. I am interested in developing practical intelligence and expand[ing] the art of the possible. So I call it the creation of social capital, the creation of economic capital, the creation of ecological capital. If a person could have those three capitals, and a new vision, and the ability to be flexible [to] work with any part of the system whether private or public or mainstream or opposition, or whatever, it doesn't matter. I think we got it right. So some of you could go to the school system, some of you could go to conservation, some could go to democratization process, some through food. It doesn't really matter.

Pramod also shared with me some recent work he has done on developing learning outcomes for students in the LECL program. The ecological knowledge and skills that he identified are noted in Table 5.

The kingfishers and burrowing owl
 Dig deep into the earth
 To make burrows for their nestlings
 With fervor and with mirth.

CHORUS
 Ground, platform, burrow,
 Cavity, cup and pendulous
 Practical yet tasteful
 Bird nests are tremendous!

Table 5. *Desired LECL Ecological Competencies*³

Desired Outcomes/ Courses and Thematic Content	Inter-species Partnership (ECFL, CERM, LTP, CBL)
Knowledge base (GPE, LFS, CERM, ECFL)	Natural cycles, webs and networks such as hydrological cycles, soil cycles, solar energy flows, cyclic material flows, bio-geo-chemical cycles, watersheds, food-webs, wetlands, urban ecosystems, plant-animal interactions, photosynthesis, biosphere, biomass, ecosphere, hydrosphere
Comprehension of issues (GPE, LFS, CERM, ECFL, CBL)	Biological and cultural diversity, bio-cultural diversity, animal-plant interactions, interrelationships between eco-sheds, human-sheds and learning-sheds
Skills and Practices (LFS, CERM, ECFL, LTP, CBL)	Nature observation, immersion into nature, participatory science, whole systems thinking, envisioning, planning, taking informed action, creating learning sheds and networks
Worldviews/aesthetics (ECFL, LFS, CERM, LTP, CBL)	Recognition and appreciation of the more than human world and their contribution to earth household, reciprocity, sacred landscapes, moral ecology of using nature
Building of natural, social and economic capital to achieve sustainable livelihoods for yourself and others (LFS, GPE, CERM, LTP, CBL)	Create designs, curricula, practices, guidebooks, exhibits, and educate about holistic systems analysis of ecosystems and ecological cycles

Faculty Recommendations for Sustainability Education Programs

I asked Pramod and Dilafruz if they would have any suggestions to faculty or programs interested in developing similar sustainability education initiatives elsewhere. Pramod cautioned that the LECL Partnership Model for Sustainability

³ Documented by Pramod Parajuli on March 23, 2005. Note: GPE = Global Political Ecology, LFS = Leadership for Change, CERM = Collaborative Ethnographic Research Methods; ECFL = Ecological and Cultural Foundations of Learning

might not be an effective model for other programs as it was created in a particular place with a particular set of people: the terms he used in the model might not be the right words to effectively speak to the needs of another group of people in a different setting. Pramod advised that it is important to be attuned to your historical time and place, and to act accordingly. However, Pramod felt that it would be important to focus on relationships and community and to include “some kind of interrogation about the economic hegemony in our thinking and policy and design through more ecological principles including permaculture and whole systems.” He also felt that there should be an emphasis on how people learn, in all facets of life, and that it would be important to “cultivate appreciation for biocultural diversity, [for] how to appreciate the drama of nature, how to appreciate our own participation in the breath of life.” Finally, Pramod thought that it was necessary to include content in leadership, organizing, democracy, and participation. Speaking from his own experience, Pramod felt that it was helpful to be a “perennial optimist.” In closing, Pramod said that LECL is “an evolving, unfolding process,” and that it should be an open process, not a rigid or set structure, but he cautioned that if LECL wishes to be successful it must also be aware that it is part of a system.

I think we have stretched the PSU system to its limits and there is more to do. So we have to be aware about when to stop stretching and letting it kind of heal a little bit, otherwise it might say “No. I cannot handle you.” It can happen, right? It’s too much, you know. If you break the whole thing, you know...so you have to know how much to ask for in the sixth month, how much to ask for in a year.

You have to be very aware of the timing, because a system is a system. If you overdo it, it will brush off, it will engulf you, right? I hope we have not gone beyond the limit. And to me I think we have taken the more positive aspect, rather than destructing the system. We are saying there is another way of doing it and that other way of doing it itself takes care of the critique. That's what my approach has been. That's why people are not completely confronting me saying "Why are you destroying what I have?" I have said "I have not destroyed what you have, I have just added something new, right?" (laughing) "I'm adding a new room, I'm not destroying your room."

Dilafuz added that such initiatives can't be forced onto people, and that it is important that such initiatives do not come from only one person, but involve people with diverse backgrounds and skills that share a deep commitment to making it work.

I would say that it would have to come from not just one person. It would need to come from a couple of people who are really vested in this ... in making this work, it's their life's passion. I look upon this as a natural fit for myself. I don't look upon it as something different. Nor does Pramod. And you really need people like that. It can't be forced onto people. You really need people who have a deep understanding of what the issues are. I think you need people who have a global perspective, too. I think what's unique about Pramod and me is that we bring that. We come from a different country, and different cultures. I think in some ways that's kind of good because we were brought up in a different culture that was sustainable. So we can speak with some authority and authenticity about that and Pramod more so because he was brought up in a rural area, whereas I was brought up in an urban area. It's kind of nice to have these various perspectives that we can bring. We can balance each other. And the same would be required elsewhere -people who are not very similar, people who do bring different perspectives but have the same, similar passions, and similar interests. But they come to it from different places, both academic and through their lived experience, I think.

Dilafuz also mentioned the importance of bringing in diverse perspectives from the outside community as well, noting it “takes a little time to do that.”

CHAPTER VII

RESULTS AND ANALYSIS -- LECL VISIONS FOR ECOLITERACY FOR SUSTAINABILITY: FOCUS GROUPS

My purpose in conducting focus groups with LECL students was to gain insight into students' views about the ecological component of the LECL program as it is currently manifested, and discuss how it might be further developed to best meet the needs of students. The focus group questions were intended to provide insight into how students of programs such as LECL view their educational needs for the purpose of guiding programmatic and curricular development of LECL and similarly focused sustainability education programs. Chronologically, the two focus groups occurred after I conducted the individual interviews with students. The first focus group, held on March 22, 2005 was comprised of four students; the second focus group, held on March 23, 2005, had two participants. The participants were Kerry Newberry (KN), Sarah Logiudice (SL), Greg Dardis (GD), Gayle Highpine (GH), Cheyenne Glasgow (CG) and one student who chose to remain anonymous (AN).

Students' Backgrounds

The LECL students who participated in the focus groups had a variety of academic and professional interests. These included watersheds, indigenous knowledge, urban planning, community dialogues, writing, education, development and community relations, ecological education and agroecology. Students generally felt some ecological knowledge was important to their future career plans, but varied in whether or not they felt ecological courses should be a required part of the curriculum.

Reflection on Research Method

As a research tool, I found that the focus group was useful in exploring questions of curriculum and program development, as students often became excited at each others ideas and helped to expand and flesh out possible changes in content or pedagogy. It also provided immediate student feedback on new ideas which emerged from our conversation. For this same reason, I think the focus groups limited the range of ideas that were expressed by students.

I found it somewhat difficult to find time for students to meet together, and it was easiest to set up a focus group when I established a date, time and place for students to meet and then focused on recruiting students for pre-established times. This strategy was more effective than first recruiting students and then asking

interested individuals for their availability and finding convenient times for everyone to meet based on their availability.

I used a structured set of questions (see Appendix D) for my focus groups that helped to guide discussion, but also kept the atmosphere somewhat formal. My sense was that this structure worked better for some students than others. Participation levels varied widely. I tried to facilitate equal participation but sometimes this did not work because some students had more to say in response to one question than others. I also had the sense that some students needed more time to reflect in quiet before answering a question. The nature of the focus group didn't provide this kind of reflection time, though this countered to some degree by providing students an opportunity to respond further to questions when they reviewed the transcript for the focus group.

Themes of Conversation

Interestingly, both student focus groups independently began with a discussion about the meaning of ecology. Both times, when I asked my first question, a student from the group immediately asked what I meant by the term "ecology." This led students in both groups to discuss how ecology had been poorly defined in our program. Students with a science background knew that the definition of ecology used in the LECL program was different from and broader than the definition used in their science classes, but they had difficulty articulating how it differed. Students also mentioned that they felt culture was another term that

needed to be better defined in the program. One student mentioned that while culture may have a certain definition within an anthropological context, it may need to be defined better for students looking at culture in the context of community relations and sustainability issues.

This etymological interest illustrates that while definitions for “ecology” and “culture” are specific within the disciplines of science and anthropology, common usage of these terms has muddied their meaning for students of sustainability. Defining culture and ecology in terms that are relevant to sustainability is important to students. In addition, students wanted to have a better understanding of what sustainability means.

For the purposes of our focus group discussions, and so that we wouldn’t get stuck in a discussion of etymology, I informed students that I would use the term ecology to mean nature which included abiotic and biotic elements like rivers, rocks, animals and plants.

I summarized students’ comments concerning the ecological knowledge, skills and pedagogy that they wanted included in the program in Table 6.

Pileated woodpecker, and the little elf owl
 Use cavities in tree trunks and cactus
 They make them themselves, or find someone else’s
 Cause they don’t always build better with practice.

CHORUS
 Ground, platform, burrow,
 Cavity, cup and pendulous
 Practical yet tasteful
 Bird nests are tremendous!

Table 6. *Summary of Student Suggestions for Content and Pedagogy of Ecology**Component of LECL Program*

Knowledge	basic ecological principles; science; critique of science; urban ecology; agroecology; urban forest; medicinal plants; keystone species; watersheds/water cycle/river; soil; plants; animals; regional ecology; regional culture; regional politics; trophic levels/food chains; food systems; health; transportation; indigenous cultural relationships to nature; Pacific Northwest ecology; deep ecology; systems thinking; biomimicry
Skills	scientific process; developing comfort in communicating with diverse groups about sustainability topics; permaculture; species identification (local animal and plant species); habitat restoration; community organizing and project work; teaching/facilitating groups; critical writing and thinking
Pedagogy	project based; place based; inquiry based; hands-on; group work guest speakers; outdoor learning; mix science and non-science students together; have students with biology background practice teaching; celebrations around natural cycles/seasons; outdoor learning experiences; nature immersion for concentrated periods of time

Ecological Knowledge

Students were interested in learning about ecology from scientific and cultural perspectives and studying how humans interact with their natural environments. They also wanted to develop familiarity with their local landscape, and practice skills like habitat restoration, permaculture design, and species identification.

Ecological Skills

Students were interested in developing skills related to sustainable living practices as well as community organizing. They gave examples of restoration work, farming, permaculture design, and natural history skills. Communication, facilitation, critical thinking and writing were skills students thought would be

important for engaging in community work. Both focus groups thought an essential skill to be developed was the ability to engage in meaningful dialogue with diverse cultural groups around the issue of sustainability and ecology, including etiquette for approaching tribal members, ranchers and pro-globalization thinkers. They wanted to be able to discuss sustainability concepts with a solid understanding of how they are defined within different subcultures and contexts. Some students felt that learning to communicate ideas within different cultural contexts was more important than learning ecological knowledge, as other departments offered courses where ecological knowledge could be gained. These students felt the uniqueness of the LECL program lay in its focus on the cultural elements of sustainability.

GD: A lot of this work has to do with learning the skills of communicating to people who don't already think the way you do ... learning how to make this kind of bridge is not a skill you're going to get someplace else.

Pedagogy

In terms of pedagogy students were interested in hands-on, project-based, place-based approaches to learning about ecology. They thought it would be best to combine students with and without science backgrounds in the same classes to provide opportunities for rich discussions about how to understand ecology from diverse disciplinary perspectives. Some students thought it would be good to have

science students help teach portions of the class so they could share their knowledge and practice teaching.

How Much Ecology Should Be in the LECL Program? Where Should It Fit into the Curriculum?

Students were mixed about how much ecological content they felt they needed in their program. Some students felt that it was unnecessary to include much ecology in the required core classes of the program because they had already had environmental science classes or biology classes.

SL: I have to say my experience is that I wasn't necessarily looking to learn a lot about the natural world ... my undergrad was environmental science and I took a lot of science classes so I fulfilled a lot of that and I wanted to progress and learn tools and communication tools through education ... ways to connect ecology and nature with different communities and different cultures and from that [to learn] ways to work with those communities and cultures.

Interestingly, while some students with strong science backgrounds did not want a stronger focus on ecology in the program, others felt this was a key area they wanted to explore in their classes.

AN: I thought...I would learn a lot about education which I have and culture ... global and local culture and I feel I've learned a lot about that. And ecology, I felt that it would have equal footing as the other two, and I feel it's been something sort of interwoven but...I don't feel there's been a huge focus on any of our classes really on ecology ... I expected to be a little bit more immersed in Pacific Northwest ecology ... or more immersed in deep ecology, more immersed in looking at ecology as a way in which we

study the rest of our system and cultures around us. I feel like that's woven into the program but it hasn't really been directly focused on.

Students with little science background were also mixed in their response to how much ecological content they thought should be in the program.

Overall, students thought it would be best to have some required coursework that focused on developing basic ecological literacy, but that this shouldn't detract from the other aspects of the program. Students wanted a balance of all three aspects of sustainability. Several students mentioned that they were looking at graduate programs in ecology and environmental science, but decided to join the LECL program because they felt they could study ecology *and* culture *and* education.

KN: I remember being drawn to the course descriptions on the website, which is how I found the program. I liked the interdisciplinary component - integrating social, ecological and economical sustainability.

Students also felt it was important to take advantage of courses in environmental science, biology and ecology offered in other departments so that the LECL program wasn't trying to duplicate courses that could be taken by students as electives. One student mentioned that she felt discouraged from taking science classes from her advisors, however. Other LECL students have been frustrated with the "objective" and utilitarian philosophy towards the natural world that they have encountered in science courses taken as part of their LECL program electives.

Students in the second focus group had suggestions for changing the structure of the LECL program. I try to capture these below. The two students in the second focus group thought it would be a good idea to have one class that was focused on ecology. They suggested blending the Leadership for Sustainability and Global Political Ecology courses to create one course on Global Political Ecology. This would leave room for one of the four core LECL courses to focus on ecology. Students thought this class should focus on local and regional ecology, urban ecology, scientific methods and knowledge, critique of science, and regional politics and culture as related to ecology.

AN: We could have that class be really focused on ecology ... I feel like people should walk out of this program and they should know the regional politics and regional culture and regional ecology. They should just know all of those things, because I feel like this program could be, purports to be, so much about knowing your place and knowing your community ... so really looking at ecology as a way of learning about every part of this. That would be a really cool class.

In addition, students thought that this class should focus on ecological projects such as restoration work that could include analysis of local politics and culture. One student thought this would be a good learning experience for those students with strong science backgrounds as well as those with little ecological background. As our conversation progressed one student came up with the idea of having the class be on Local Political Ecology with the focus of the class being on how ecology affects the culture and politics of a certain region.

Robins, thrush, swallows and dipper
Make mud, twig, grass, and moss cups
On houses, in grasses, or even mid-stream
But mostly in branches, high ups.

CHORUS

Ground, platform, burrow,
Cavity, cup and pendulous
Practical yet tasteful
Bird nests are tremendous!

CHAPTER VIII

RESULTS AND ANALYSIS -- LECL VISIONS FOR ECOLITERACY FOR SUSTAINABILITY: INDIVIDUAL STUDENT INTERVIEWS

I analyzed separately the one-on-one interviews I conducted with students in Portland State University's Leadership in Ecology, Culture and Learning (LECL) program and those conducted as focus groups. For the individual interviews with students I asked questions that would give me insight into how students connected with the natural world in their personal lives. I also discussed with them how they had learned about nature in university courses as well as in nonformal learning environments. I listened for how these learning experiences had helped students define their understanding of the natural world, and how it had influenced the relationship they have to nature. Finally, I discussed with students how they would like to learn about nature in a hypothetical graduate class in which students explored nature and the human-nature relationship.

Students' Previous Experiences Studying Nature

One of the initial findings which came from my interviews with students in the LECL program was that all of the students described having experiences of

strong connection with the natural world. This was true for students with a strong academic background in the sciences and for students without it. While this finding may seem self-evident, as the students being interviewed chose to study in a program that emphasizes ecological learning and for this reason might be expected to experience their connection with the natural world as one with meaning, I think it is important to note. It illustrates that these students who are interested in biocultural sustainability and education, have developed their connection with nature through a variety of avenues. Some students chose to study about nature through college and university courses in biology and environmental science. Others studied the human-nature relationship in geography, anthropology, sociology, and religion courses. Students in the program have had nonformal educational, and personal, experiences in which they have explored the biological, spiritual, political, social and economic realms of their relationship to nature. The students I spoke with have nurtured their relationship to the natural world through many disciplinary avenues, academic and non-academic experiences. I want to start my analysis here, because I believe it is important to consider this fully. It has implications for how we might begin to think about what ecological learning and teaching has been, what it can be, and what kind of ecological education might best fit into a curriculum intended to teach students the principles of bioculturally sustainable living and practices.

At the beginning of the interviews, I asked each student to tell me about their academic experiences studying the natural world. I also asked them to share

with me their informal learning experiences studying nature. Their answers are summarized below.

Tim Holbert has a BA in Biology. He has worked in the biomedical field for over a decade. He took biology courses as an undergraduate. Tim is in his third year in the LECL program and is focusing his studies on Indigenous Knowledge Systems. He currently works in human health research. He was interviewed on October 3, 2004.

Mindy Dornblaser has a BA in Social Sciences with a concentration in Psychology. She has taken undergraduate and graduate courses in environmental science and geography that explored people's connection to place. Mindy is in her third year of the LECL program and is focusing her studies on Public Education and Food Systems. She is also receiving her teaching license from Portland State University. She was interviewed on October 5, 2004.

Dan Daly has an associate's degree in ecology and environmental technology and a BS in Environmental Science. He has taken coursework in systems science and ecology, and has studied nature awareness skills with Tom Brown, Jr. and other teachers. He teaches environmental education and nature awareness skills to adults and children, and developed and teaches a course in naturalist training for the LECL program. Dan is in his second year of the LECL program and is focusing on Sustainability Education. He was interviewed on November 24, 2004.

Rebekah LaBar has a BA in Social Sciences. She has taken courses in anthropology and religion that have explored the human-nature relationship through cultural and spiritual lenses. She recently graduated from the LECL program. Rebekah's focus in the program was Indigenous Knowledge Systems. Her final project investigated the cultural needs of Native American women in higher education. She is currently working on a doctoral program in Post-Secondary, Adult and Continuing Education and works for Portland State University's newly developed Native American Center and as a mentor for Native American students. She was interviewed on December 8, 2004.

David Moen has a BA in Intercultural Studies with a minor in Biology. He has taken coursework in biology, religion, and anthropology, and has studied nature prayer walks with Fred Kruger. David is in his first year in the LECL program and is interested in exploring the cultural dimensions of condor reintroduction in the Northwest. He has worked as a field biologist and as an outdoor, eco-action educator and naturalist. He was interviewed on January 14, 2005.

In my interviews with students, I asked them to imagine a graduate level class for students such as themselves, who were studying in a master's program for educators of sustainability. I explained that the purpose for the course would be to teach students about the natural world and to help them explore their relationships with the natural world. We discussed how such a class could be taught as well as what content it should include. Some of the major themes came from participant's

previous experiences. Others were ideas they found appealing, but had not experienced personally. Some students commented on aspects of the LECL program as they reflected on this question, though my questioning was not particularly aimed at analyzing our program. I thematically categorized the major recommendations that were articulated into the following sections:

Nature Immersion and Observation: Spending Time Becoming Aware

Ecoliteracy: Delving into the Nature of Nature

Biocultural Literacy: Exploring Human-Nature Relationship Natural

Economy: Practicing Natural Livelihoods

Critical Pedagogy: Knowing the Distances that Separate

Holistic Education: Creating Systems of Relationship

For each of these categories I begin my analysis with a summary of the main points for that category. I then elaborate by referencing the particular student comments that form the basis of my analysis. Finally, I evaluate the findings for that category in a concluding paragraph. The reader who wishes to skim through my findings by category can read the first and last paragraphs for an overview. A deeper reading, providing insight into the context for my summaries, can be had by reading through the entire section. Those readers who are interested in reading only specific categories will find them easily referenced by sub-headings. I follow this detailed categorical analysis with a synopsis of student's comments on the value of the proposed course, as well as some general reflections on the interviews.

Hypothetical Course on Ecology and the Human-Nature Relationship

Northern oriole young are suspended
On a limb, in a deep, woven pouch
Safely away from predators,
And secure from a fall into “ouch!”

CHORUS

Ground, platform, burrow,
Cavity, cup and pendulous
Practical yet tasteful
Bird nests are tremendous!

Nature Immersion and Observation: Spending Time Becoming Aware

Summary. The most emphatic, and often the first, answer to my question of what should be included in a class designed to teach students about nature and help students explore the human-nature relationship was that students wanted to spend time outdoors, observing nature. Multiple reasons for this were given. Students' comments fell into two basic categories which I distinguish as external and internal processes of awakening awareness. Students spoke of how time spent in nature developed their awareness of nature (external), and also helped shift their emotional and physical states of being so that they experienced themselves in context with nature (internal). Observing nature increased students understanding of ecological phenomena by allowing them to read nature as text and absorb natural knowledge directly using all their senses. In addition to developing knowledge of birds, mammals, plants, water systems, weather patterns and other natural phenomena, students also spoke of internal processes that spending time in nature initiated.

They brought up that spending extended time in nature helped to develop the ability to perceive subtleties and patterns of natural phenomena, thereby increasing their capacity for learning from nature. They also shared examples of how long hours spent outside had given them a profound sense of well being, and established in them a feeling that they were a part of nature.

Time in Nature. All of the students I interviewed thought that time spent in nature would be an essential component for my hypothetical class. This was often the first recommendation made. Tim felt that “placing people in nature,” would be “most useful and fun” for a class like this, and referenced a class activity where students visited a local riparian area to practice nature observation skills and investigate ecological principles. According to David, exposing students to nature and providing opportunities for nature observation “would be a key ingredient.” Dan repeated emphatically, “the most important thing is time spent in nature, time spent in nature, time really spent immersing ourselves in nature.” He added this was especially important because many people do not spend much time in the natural world. Rebekah wanted “some kind of class where you actually went out,” explaining that “it’s not talking about it, but going out and participating in an activity outside,” that would help strengthen her relationship to the natural world. “I need to feel that connection and actually be outside,” she said. She suggested learning about nature and the human-nature relationship by studying salmon, a keystone species in the Pacific Northwest and an essential source of physical and spiritual food for the Northwest’s people. She enthusiastically commented that it

would “be great to have some kind of field trip,” and gave an example of going to the beach to study tidepools and the animals that live in them. She also pointed out that it isn’t necessarily being outside that’s essential, but having direct, multi-sensory contact with living organisms.

For me, I think it would have to have some kind of kinesthetic aspect where you’re bringing in your five senses and actually working with things that are living and growing, even if it’s inside the classroom.

Throughout the course of our interviews, students described a variety of nature experiences that had been meaningful to them, that they would want to see offered in a course like this one. The emergent view placed “nature” in a variety of settings such as wilderness areas, zoos, farms, fields, backyards, one’s own body and city parks. The impression I was given, however, is that most students’ first thoughts when speaking of going “to nature,” to “learn about nature” and explore their relationship “with nature” were of visiting wildish places. Rebekah and David both mentioned wanting to have a sensory connection with the natural world when they answered the question of what should be done in the class to enrich their own relationship with nature. David wanted to be on a farm so he could get his “hands dirty.”

External Awareness. One of the reasons students wanted to spend time outdoors was that they wanted to learn about ecological phenomenon by direct observation. All of the students I talked with shared stories of times they had learned about details of natural phenomena like weather patterns, plants, or animal

behavior by spending time in wild natural areas. David shared a story of a time he was working on falcon rehabilitation and spent his summer outside. He said the prolonged time he spent in the field gave him a new opportunity to notice what was happening with weather patterns and animal's behavior cycles, and gave him a sense of how natural time differed from human time.

It was an amazing experience sitting in the field with these falcons... I learned that nature's cycles and rhythms are much slower and different than our human rhythms, and I just got to sit ... and learn about it for a summer ... 14 hour days in the field just sitting in one place, and I got to see how the sun moved across the land, the changes of the skyscape-how certain cloud patterns would appear at certain times of the day, and the rattlesnakes and wildlife would visit our blind or come out at certain times. And there was just this awareness of the life-pulse of nature... like the heartbeat of the earth, everyday. Being introduced to that in a really concrete way was special for me, but it was a subtle and lengthy process.

When I asked David how his science classes had supported him in developing a deeper relationship to nature, he responded by saying that contact with nature was the key, and that his contact with nature motivated him in his academic study because he wanted to learn more about what he had noticed.

If it was any class that got me into the field then it supported [my relationship to nature] ... if it wasn't a class that got me into the field then it didn't support it (laughing) ... If I stayed in books then it didn't support it. But, if I was outside then that motivated me to get into the books, then that supported it. You see how that kind of works? Back to the idea of theory following practice.

David's comments speak to the fact that students who are outside can engage in both passive or active nature observation, and that both can help to open students to new experiences. This is important to note, especially for educators who may feel unprepared to teach about nature, and therefore be cautious about bringing students outside of a classroom setting. By simply spending time in nature, whether directed, or undirected, learning occurs. Nature becomes both the text that is studied and the teacher who asks questions that spark investigation and discovery.

Mindy spoke about an afternoon she spent looking for animal tracks and signs as part of an animal tracking training. She was surprised by how much she noticed about the particular environment she was in when she directed her attention in this way; by acutely observing her surroundings to try to locate signs of animal activity she noticed more details around her.

You're looking at every single thing. You have to look at the twig to see if it's bent. You have to look at the ground to see if the dirt is shaped into the form of a foot. You have to smell and listen and immerse yourself in everything around you.

Two points Mindy made here lead us into the internal processes that students commented on experiencing as a result of being immersed in the natural world. As Mindy focused her attention on the plants, animals, soil, and rain *outside of herself*, Mindy also became more aware of herself *as outside*, as nature. "It keeps you outside of yourself," she said of her tracking experience, "You're not walking on a trail in nature. You're not separated from nature." She added, "You have to heighten your senses, all of them. So you have that purpose that blends you into

your surroundings and engages you in nature.” External awareness shifts internal awareness, and boundaries are dissolved.

Internal Awareness. Several students commented on how spending time in nature shifted their internal awareness so that they were better able to take in visual, auditory, tactile, and olfactory cues, heightening their abilities to observe natural phenomenon. They spoke about how spending time outside made them feel good physically and emotionally. Mindy mentioned that some of the internal benefits students experience as a result of outside learning has relevance for classes even when they are not focused on nature study.

Dan reflected on how his own practice of developing nature awareness skills has shifted his perceptions and ability to observe details and patterns around him. He noted that most people have limited sensitivity to natural stimuli because much of our activity requires us to narrow the scope of what we pay attention to in our environment. As an example he mentioned how by training our eyes to focus on books and computer screens we diminish our ability to take in our whole surroundings through our eyes and other senses. Dan illustrated this point by talking about how he was able to increase his awareness of the subtleties of the bigger landscape by intentionally changing the way he focuses his eyes.

It took me ten years to shift from tunnel vision to wide angle vision and what I've found ... is that tunnel vision is the vision of the thinking mind. When I go into tunnel vision I get stuck ... I get stuck in conversations, in songs, in the words in my head and then the animated, living world disappears and I get cut off from my senses. My breathing starts to fall

short and I start seeing the world in a very piece by piece way. And when I expand [my vision] ... I start to breathe more fully. I start to hear the sound of the rain. And the world becomes animated and becomes present in my being and I'm actually capable of paying attention again.

Dan went on to explain that he believes this kind of sensory re-training is critical to include in classes that teach people about the natural environment because it allows “nature to come alive for people.” He added that it also brings people into conscious awareness of the physical, emotional, and cognitive aspects of themselves, helping them become both more self-aware and more observant of natural phenomenon.

Dan described the effects of one of the nature awareness practices he uses which requires a person to find a natural area and return to it frequently over an extended period of time.

I would sit in the woods in this one place through all times of year, in the dark, with the moon, with the rain, in the springtime, with the owls, with the sounds of the rushing streams, with coyotes and mosquitoes, with all of it, and what I found was at first, sitting down, the first couple months of doing it, I just noticed that my mind was so busy. I started to notice that in my head at one time I would have a song, a conversation, and an argument all happening simultaneously, all in my mind. And I never really noticed because I was so busy moving from one thing to the next And after a few months of sitting in that one place as a practice it seemed like the wind and the sound of the birds and just the vibration of the ground, the subtle vibration of the ground, the peacefulness of that place started to break down those layers of static inside of myself.

After several months, of returning to the same place and observing his own thoughts as well as what was around him, Dan found he was able to reach that quality of peacefulness inside himself more readily, and that it produced a profound shift in his ability to perceive his surroundings.

As his mind grew quieter, he was able to more fully experience the present moment.

It took several months ... [until I began to experience] this incredible silence within myself what started happening was a whole world around me started coming alive. It was like the wind and all the subtleties of the wind, its motions climbing through the branches of the trees, all started becoming incredibly vibrant and incredibly real. The sound of the water was just like this deep symphony with all of these different instruments playing. [I noticed] the sound of crows three ridges away. The radius of my awareness expanded exponentially, and this new sensitivity towards life in all of its subtleties started to come into me. I started to come back ... into real time where what was actually happening around me was what was happening inside of me. My senses became wide open, my mind became clear and present, and [I experienced] this whole body level reconnection Even though I'd been sitting in nature for months it was still out there, it was still not happening inside of me because I was so busy in my mind I was so full of myself that there was no room for nature, and those months ... were a process of emptying out ... and making room for a living landscape to start to flow in and become part of who I was, and who I am.

Dan summarized his experience by saying that it offered him a “resensitization to life.”¹

The sense of peacefulness that Dan mentioned feeling as a result of spending time outdoors, was reiterated in childhood memories that Mindy and Tim shared with me. When I asked them to describe their most memorable experiences of feeling connected to the natural world, they remembered experiences from early childhood. Mindy described how as a young girl she would wake up early on Saturday mornings and look out her window observing the world outside, and also spent time sitting with her pony.

I’d get up at 5:30 on Saturday. Nobody else was going to be up for four hours and I had to have something to do with myself and I would observe. I would usually be inside observing outside, but I would watch the shadows move and the dew evaporate and things like that. I would just observe outside I have many, many memories, hours and hours and hours (laughing) I spent doing that ... there were cattle across the street and I observed them. I loved to watch them. And I had a pony and I would spend time out in the barn just sitting there with the pony. I would watch spiders build webs and things like that in the barn. I spent a lot of time doing those things.

When I asked her to explain what those experiences meant for her, she said they influenced her, but she wasn’t sure exactly how, “other than that when I look back

¹ Dan practices nature awareness techniques developed by Tom Brown, Jr., a skilled naturalist and tracker who has written several books and teaches naturalist and wilderness survival skills out of his school in New Jersey. Jon Young, trained by Tom Brown, Jr. runs the Wilderness Awareness School in Duvall, WA. For more information on Tom Brown, Jr. visit www.trackerschool.com. For more information about Jon Young visit www.wildernessawareness.org.

on that I have a peaceful feeling. You know, it's kind of this deep down inside ... centering ... I guess you would call it." Tim similarly spoke of having early childhood memories where he felt a sense of "utter contentment and peace" when he was outside of his home.

I was probably about five years old. We lived in southern California at that time, and it was probably an afternoon very similar to right now, the light was very similar, where it's that kind of later afternoon, low-angle light like in the fall or spring, and the light was coming through these tall, probably fir or redwoods, that were right in front of our house at the time and for me the feeling there was of peace, just utter contentment and peace.

These descriptions by Mindy and Tim highlight the feeling of well-being that both of them felt when observing the natural world in quiet contemplation. It is similar to Dan and David's descriptions of their time spent in the field.

A thread that runs through all of these stories, is that spending lengthy periods of time observing nature generates greater external awareness and understanding of the intricacies of the natural world, and also instills an expanded sense of self that includes the natural world. Tim referenced this explicitly when he eloquently spoke of how the light streaming through the trees in front of his childhood home is a symbol for him as an adult for the kind of relationship he would like to have with nature.

That image has been a guiding image for me - the light through the trees -- the aesthetic magic of it, the biochemical magic of it, of photosynthesis, and energetically what's happening ... is magical as well a guiding image for me of the kind of

relationship that I want [with nature] There wasn't a sense of me and nature it was just a sense of what you might call "egolessness" or "ego expandedness," just being and just peace. I didn't have a sense of 'oh there's me and there's the trees and there's the sun' just a sense of contentment and being. It was quite wonderful.

Mindy thought it would be beneficial to provide an intellectual framework from which students could analyze how their senses and perceptions affect their relationship to the natural world. She suggested that readings such as *The Spell of the Sensuous* by David Abram would be important to include in a class focused on nature and the human-nature relationship as this would help students to explore intellectually the concept of human perception, providing a framework for understanding how our perceptions are affected by, and affect, our experiences of nature. She felt that this would help students "to understand our place [and] our relationship with nature in different ways."

When I asked Mindy if she had experiences as an adult feeling the same sense of peacefulness she had experienced as a child when she was observing nature, she shared a recent experience she'd had of spending a weekend in the woods with a large group of people. She took time away from the group to spend some time by herself.

I found a spot up off the trail, the trail kind of washed out in a place and I went beyond that and I went up into this area where the trees were and there wasn't any undergrowth. It was like a canopy of trees and there was a stream along the side and the ground was covered in moss. And it was just beautiful. And it was dry because it's been dry lately. I laid down on

the moss, to look up into the branches of the tree above my head, or turn over and look in the moss and see the little world around me. That's the same feeling. It's almost like meditating ... it felt like medicine.

Mindy said this was a rare opportunity for her because as a “scattered graduate student” she wasn't able to spend as much time as she would like outside.

All of the students I spoke with expressed a strong interest in wanting to spend time in nature, they also expressed that they didn't have many opportunities for this in their adult lives, particularly as students. Of significance here, is a comment Mindy made about a class she took as an undergraduate that was sometimes held outdoors. Though the class was about human development and psychology and did not have a focus on the natural environment, Mindy shared that simply being outside added a dynamic to her experience that deepened her learning.

I took classes that were held outside that weren't specifically focused on being in nature ... psychology classes ... where you were being introspective and it wouldn't work in a classroom. It wouldn't be the same in a classroom. We [had] ... interaction with nature without being specifically focused on that interaction ... we weren't specifically asked to look at nature ... but it was essential, I think, to the class.

Mindy talked about how being outside in this class allowed students to experience sensory cues (i.e., sunlight, breezes) and also allowed them opportunity for physical movement. By taking the class outside, the learning environment automatically became one that invited more complete human engagement, not limited to the cognitive realm. This speaks to the potential benefits outdoor classrooms can have for adult learners. A natural environment is full of complex and dynamic visual,

auditory, olfactory, and tactile cues, exposing students to them automatically ensures a multi-sensory learning experience that engages us as emotional, physical, spiritual and mental beings. It also helps to reacclimatize students to the benefits of being outside.

Concluding Thoughts. Students discussed that spending time in nature would be essential for a class attempting to provide students with an understanding of nature and the human-nature relationship. This was generally understood as time spent outside, though one student mentioned how bringing nature inside a classroom could be effective. The reasons students gave for including time outdoors was to support both passive and active nature observation which would lead to greater understanding of biological phenomenon and ecological systems. Also, students cited that spending time outside, particularly when this was an extended period of time or time spent in one place, increased their sensitivity to natural cues, and helped them to be more observant when studying nature. They also mentioned that spending time observing nature gave them a sense of peace and a feeling of being part of, rather than separate from, the natural world. One student mentioned that the multi-sensory aspects of an outside learning environment enriched her learning experience even in a class that was not focused on nature study. Time spent in nature increases intellectual understanding of the natural world, enhances sensitivity to sensory cues, and reveals the natural qualities of self and human experience. As the complexities of nature and human nature emerge

simultaneously from the learning environment they are naturally understood as integrated.

Developing Ecoliteracy: Delving into the Nature of Nature

Summary. All of the students with whom I spoke expressed a desire to learn knowledge about how the natural world functions. They wanted to learn about “outer ecology” through studying the structural and functional aspects of natural communities. Specifically, students wanted to study the basic principles of ecology, local natural history, and ecosystem health. They were interested in developing skills in identifying flora and fauna and restoring natural habitats. Students also wanted to learn about their own physical bodies, by studying human biology and health. They were interested in the skills of wild food and medicine identification, gathering and preparation, and various methods for growing their own food. Students also wanted to explore how human communities fit into natural communities. Students felt this set of knowledge and skills would be best learned using a combined method of studying traditional ecological knowledge systems and western-based science as well as engaging in direct nature observation, so that comparative analysis of a variety of knowledge systems and cultural attitudes towards knowing nature would be possible.

Outer Ecology: Understanding Ecosystems and Restoring Environmental Health. All the students I interviewed thought that learning detailed knowledge of natural systems and processes should be a part of my hypothetical class. They were

interested in learning about ecosystems and ecology by observing and studying the relationships that are found in natural communities. Students who had formally studied ecology and biology mentioned that studying both macro- and micro- levels of biological organization developed their understanding of nature's complexity and deepened their appreciation for nature.

Dan thought it would be most useful to keep a holistic, systems approach that focused on "understanding how organisms reciprocate and cooperate with one another so that life can continue." He thought this was important because "it helps us build an understanding of living systems so that we can redesign our economies and human societies to mimic natural systems."

David discussed how focusing on one part of an ecosystem had been a good way for him to learn more about other parts of the ecosystem. He mentioned an "amazing" course he took in which his class followed the path of a watershed from its headwaters to the ocean, and learned about it through firsthand study, and also talked about how his focused study of ornithology opened up a whole new world of discovery that extended well beyond the realm of birds.

Studying birds there's just so many skills that you develop that tune you into nature appreciation and nature awareness, so that it applies across the board to whatever natural realm you're studying. I think that really started to ... refine my connection to the natural world.

David elaborated on how listening for birds' songs, and closely observing their behavior, led him to become more observant of the natural world. Through

observing birds he began to notice how seasonal and weather patterns corresponded with the absence and presence of bird species. As he's traveled, he's been able to study bird populations in different geographical regions, giving him a greater comprehension of both temporal and spatial dynamics, and an expanded awareness of where he is located.

I'd always been intrigued by birds but I'd never known their relationship to other species. Having the ability to discern that by just studying a field guide and being taught their songs and their behavior was really important to me. That became a tool for me to feel a connection and be empowered to know my place, know where I was. It just opened up the whole world to me because it didn't matter where I went there would always be birds there and I could always learn about the different residents of that area. For me that was like giving me a geographical context to fit into, a connection to 'home.'

Tim mentioned that learning the details of plant systems had been interesting to him. And Tim, Rebekah and Mindy all expressed interest in learning how to identify flora and fauna in local ecosystems. They were interested in learning about edible and medicinal plants and how to gather and prepare wild plants as well as how to cultivate plants in their own gardens. Rebekah thought it would be informative to learn about uses of plants while learning "scientific knowledge" about plants. Mindy thought having some scientific knowledge of the natural world would be helpful.

Dan and David mentioned restoration work as a useful skill. Dan brought up the importance of knowing how to identify healthy and unhealthy ecosystems and

discussed how learning about indicator species was helpful in that regard.

David shared an experience he had working on a raptor rehabilitation project, and asserted that his work with the birds fostered in him a sense of responsibility, “I felt like ... a surrogate parent ... it was my job to ensure their safety, monitor and record their development. I felt a big responsibility there.” He also shared how actively caring for these birds increased his empathy and sense of connection with other species, as well as a fierce protectiveness. One bird in particular, made a deep impression on him.

She was a healthy female we called “Red” since she had a red leg band. You have to picture the scene. There’s nothing but open prairie with a few shrubby patches of mesquite here and there and one or two lone ponds... coastal plains extending to the horizon till the ocean. Our site was a simple blind and a big platform with a box on top with seven squawking juvenile flacons scampering about inside, the “hack box” it’s called. So, when we’d open up that box door the birds would eventually all come bumbling out to explore around and catch some wind. This is the toughest part for them, but with the right combination of wind and courage they would take their first flight, usually just a real high hop with some stall time. So, the time came for Red to take her first shot at it and I see her float up and then catch a down wind. She was sailing straight for the nearest hedge with a pond. I saw what was coming. My fears were confirmed as I watched her go right down over that hedge without popping back up the other side. I thought, “that’s it, she’s in the water!”

Without thinking, David sprang into action.

I jumped up and just started running ... I came to the other side of the hedge and there she was in the middle of the pond, flapping at the surface of the

water looking like soaked laundry. She looked pathetic and I thought she was going to drown or get eaten by an alligator or something So here was this analogous experience of the bigger picture of bringing these birds back, there's nothing to restore of an endangered species unless they are saved first, right? So, without hesitating ... without thinking ... I just hacked a limb off the mesquite, shaved it down and headed straight for her in the pond. I rushed over and she was [afraid, but] ... she grabbed on! I picked her up and took her to the shore edge real quick and she didn't let go ... so I just picked her up and headed for the hack box. I ended up walking her all the way back to the flight stand where she had taken off from and I put her back on a perch there. She was fine after that, drying in the wind with her scared siblings.

David talked about how his actions surprised him, and showed him how much he had grown to care for these birds.

After the adrenaline, and mud, and water, and excitement all dried and settled it occurred to me how crazy that was for me to do. That whole area is full of serious dangers. It's south Texas! There are coral snakes, rattlesnakes, cottonmouths, alligators, and whatever else of fire ants and ticks and stuff to run into. But, wow, it was like "mother bear," or "father bear," coming out in me. There was a call to action and I just headed straight for what I needed to do without second thoughts. It happened, it was successful and everything went smooth, but I didn't even care about the danger. I should have, but I didn't. So, it happened and it was impacting to make a difference like that.²

One of the points David makes in his story was that his experience with Red was a metaphor for the overall situation of the falcons, and his emotional response to her danger was driven by both his relationship to her, and his understanding of the

² David confirmed that Red was successfully released at a later date.

overall plight of her species. The experience gave him an opportunity to feel in tangible terms what it meant that these birds were endangered, and also to enact a human response that would help them.

Later in his interview, David talked about how engaging in restoration work has benefits for the person engaged in the work as well as a positive effect on species and habitat. “I think all education should be restoration based. Restoration of our inner ecology: knowing our bodies and cultivating health, and restoration of our outer ecology, replenishing the earth.” He felt an important way of addressing both human and environmental health was through studying and practicing methods of farming and permaculture that “mimic and sustain the cycles of nature ... and invites the natural players of that ecosystem into the process.” Dan also raised the importance of nurturing an attitude of caretaker.

Inner Ecology: Understanding Self as Ecosystem and Restoring Human Health. Tim was interested in studying the human body as an ecosystem. He talked about the significance of this in terms of self-identity and how we define concepts like “ecosystems.”

Teaching people awareness of what’s happening within yourself and within your surroundings is very helpful ... learning those good, solid, ecological principles and then bringing them back to yourself ... your own body and how your own body works, learning about the microbes under your skin, the fungi and the bacteria. We think “Oh, I’m a being and a person,” but you’ve got millions and millions of other beings living on you, from the mites that live only on human eyelashes to the microbes in your gut and on your skin. It’s [challenges] the idea of what

we are, and [helps us realize], “Oh, we are an ecosystem! The same ecological principles operate. There are all kinds of relationships going on within me.” [It’s] another way of connecting myself with nature - realizing I’m not different from nature. Meaning that this is nature (pointing to chest). That this is nature. This body here.

Tim went on to suggest that looking at magnified pictures of the details of the human body, such as electromicrographs of human skin, could be helpful and fun for this exercise in self awareness.

Students were interested in studying how humans could meet their food and medicinal needs directly from wild and cultivated sources. Rebekah and Mindy both expressed an interest in learning to gather wild foods and medicines, and prepare them for use. David, Mindy, Rebekah and Tim all mentioned wanting to develop skills in producing food through agricultural means. David was interested in having a farm as an “outdoor classroom” that could teach students about organic farming and permaculture through hands-on practice. Rebekah had a similar idea of having a year-round gardening class that would take students through seasonal cycles of food production.

I wish there were more classes where people actually grew things, where the whole class project would be to work on a garden from start to finish, a whole season. Maybe winter term do the research on planning the different crops and where they were going to be planted and what plants interact best with other plants and then the spring term maybe would be planting, planting and taking care of the garden, and then the summer term would be the harvesting, and ... preserving and...just taking control of your food source. That would be a really neat class that

went through ... a whole yearly cycle ... and then maybe in the fall recycling and building a compost place and cleaning and preparing the soil for the next year You'd have the outside part -- you'd have the participation part -- you'd have the scholarly part. Something like that where it would just be really hands-on It's really hard to plan those kinds of things, but I would definitely sign up for something like that. That would just be so exciting, it would be like a year-long project, and people could have all kinds of interrelated projects in the midst of that.

Rebekah also mentioned that looking at native people's traditional and current food systems could offer useful insights into how humans are involved in natural ecosystems.

Blending Knowledge Systems: Diversifying our Study of Nature. All the students I spoke with were interested in learning about nature through studying ecology as understood by western science and traditional knowledge systems. Mindy expressed an interest in learning some scientific knowledge and felt with respect to understanding our relationship with nature that we need to have more layers of knowledge in our learning experience. Rebekah stated that she would be interested in a class that combined the spiritual and the scientific traditions. Mindy suggested that one natural object like a tree could be studied from multiple cultural and disciplinary perspectives.

A Native American might have a story on how it came to be and what its future is ... science would have a different idea, maybe somebody from a culture that has very few trees would have a totally different idea, and I think that would be very fascinating to have this idea that the same thing can

have different stories for different people and have different meanings.

Rebekah also talked about how cultural knowledge could be learned together with scientific knowledge. “Plants, for instance -- you could have a whole written aspect about the properties of the plants you used and their history and maybe what cultures were connected to those kinds of plants, or how they used them ... [drawing from disciplines] from science to anthropology to literature.”

Some students who had experiences learning from tribal communities talked about how meaningful these experiences had been for them because they offered a relationship-based way of understanding the natural world. Tim talked about how learning from Native American teachers about indigenous perspectives on the plant world had “been essential” for showing him ways to think about plants that were not “just mechanical.” Studying traditional ecological knowledge helped him to weave together his scientific, analytical understanding of how plants function, with his more intuitive understanding, and gave him an appreciation for the different ways people can develop and express their kinship with nature.

I can use all parts of myself to relate to nature ... I can use that analytical part [to ask] ‘how does photosynthesis work?’ or ‘what’s the name of this plant, how is it related taxonomically to this other plant,’ and that’s part of me, that’s one way of relating, but ... indigenous ways of knowing allow for other parts, they allow for that energetic relationship or for that spiritual relationship, where there’s something happening that I can’t necessarily describe or name or point at, but that feels very real, and kind of an emotional connection as well, those can be there as well in an indigenous knowledge system.

Rebekah discussed an anthropology class she took on tribal fisheries systems where she interviewed tribal members and visited different tribal fisheries and spoke with fish managers. She suggested that a tribal food source, such as salmon, could be used as a central theme for studying how human communities are part of natural communities; students could learn from tribal members and participate in root and salmon feasts and other aspects of community life “to trace the different threads: the political, the educational, the spiritual, and see how [for] one group of people salmon is their way of life, and look at it from all those different levels.”

It is important to note that when students spoke of learning from indigenous knowledge, they inevitably expressed an interest in learning this in the traditional way of passed on oral information learned from people who practice these traditions. This is important because it shows that students are interested not only in studying more relational ways of thinking and interacting with nature, but also are interested in developing relationships with both diverse human communities and with places. Rebekah talked about how a class in the Pacific Northwest might explore salmon and salmon cultures, and invite tribal elders, fish managers and others who could discuss political and cultural issues. Mindy said her fantasy class would be a class in which she went out into the forest and learned from a Native American teacher knowledgeable in traditional ways about identifying medicinal and edible plants. She also wanted to learn oral history about cultural relationships to plants. “I think classes like that are really important,” she said. “It connects us to

the land in a different way. It connects us to nature in a different way. And it helps us.” When he spoke of restoration work, David stated he would like opportunities to work alongside indigenous communities and be exposed to “ways that are life giving and ceremonial.” He also thought it would be interesting to have opportunities to meet with Native American students and share ideas about sustainability.

When speaking about traditional ecological knowledge and science many students spoke of cultural differences between these approaches. All of the students mentioned the cultural aspects of scientific investigation and most thought it would be important to critically examine the culture of science and the limits of science-based knowledge. Tim was interested in studying the history of science and how its development impacted society. He felt it would be useful to study ecology in a manner that would acknowledge the limits of scientific knowledge. Acknowledging the limits of the discipline’s knowledge, he thought, would create an opportunity to learn from what other knowledge systems have explored beyond those same limits. He thought studying multiple knowledge systems that have developed along lines of inquiry different from science would be helpful in expanding one’s understanding of nature, and the human-nature relationship.

All of the students felt that traditional knowledge systems place more emphasis on looking at nature in a relational context, and that western-based science tends to see nature as separate from the human realm. For this reason, they felt it would be important to learn from traditional ecological knowledge systems.

While students were interested in studying the limits of scientific knowledge and taking a critical look at scientific culture, none of the students mentioned similarly critiquing the limits of traditional ecological knowledge systems.

Concluding Thoughts. Students were interested in understanding the natural environment as a whole, and also looking at their own bodies as ecosystems to study. They were most interested in learning ecological knowledge that was holistic and relational, and that helped them to understand their local environments better. Skills students were interested in learning revolved around restoring environmental health through habitat restoration work, and restoring human health through gardening and wild foods collection. Students wanted to study both western-based science and traditional ecological knowledge systems. They felt the culture of traditional ecological knowledge systems was more relationally based, and so was especially appropriate for learning about how to live sustainably. Students expressed interest in having opportunities for being exposed to indigenous communities and learning from and with them. All of the students brought up the culture of science, and many wanted to critically examine how it affects the way we perceive nature and the human-nature relationship. Interestingly, none of the students mentioned critiquing traditional ecological systems. This may have been because the majority of students I talked with felt more connected to scientific knowledge and so felt more entitled to critique it, or that they felt it would be disrespectful to consider critiquing traditional ecological knowledge which did not come from their own background or experience. It would be interesting to explore

this further as it suggests that considering issues of cultural integrity, cultural respect, cultural boundaries and cross-cultural exchange are important when exploring multiple knowledge systems.

Biocultural Literacy: Exploring Human-Nature Relationship

Pledge of Allegiance, Pueblo Style: San Geronimo Feast Day

It is the end of September 2001.

My mom is on the telephone
telling me she went out to the pueblo
to watch the pole climbing.

She tells me about the tourists
always talking like they have to narrate
the whole thing or it wouldn't happen.

One of them, next to her says:

"I just think that's....so.... why is he doing that?"

"How can he raise that flag after what this country
has done to him, to his people? Why is he doing that?"

Maybe you should think about why he is doing that,
my mother thinks, but not out loud.

Maybe you should think about why you are asking.

They take a tall tree from the forest, every year.

I don't know much about it, what they do.

But, every year, they take a tall tree from the forest
and strip it of its branches.

It is always taller than I remember. Every year
it is taller. They post it in the center of their village,
the space between their oldest houses, the place
they live. Who knows how long? They have always
been there. They post it in the center. And the hole
it makes in the ground, who knows what it is?

I don't know, but it reminds me of holes

I have seen in the center of old pit houses and kivas
across the Southwest deserts. It reminds me
of the little hole in my belly, the invisible
umbilical cord that still connects me to my mother.

Why? I don't know. But they remind me

of it every year. Every year they take a tree
and place it in the center. We gather around and watch.
From close up we watch. From far away, we watch.
From wet Northwest forests we watch. From cities
we watch. Or we don't watch. But they do it every year.

A group of men start out trying, and they give up
one by one. Some years you have to hold your breath so long
hoping one of them will stop sliding backwards and make it
to the top. But one of them does, every year, goes all the way
to the top of the pole, to the crossbar, where he rests
and skillfully unties the sheep and squash
gathered from this fertile valley
and lets the harvest down
to the people below.

The climb, some people say
the climb is impossible.
Every year it is harder.
I think it is harder every year.
That's what it looks like to me.

My mother says the old pole climber
- she's been watching him for years -
he's the one who went up that year,
followed by the young man in training.
The old climber unfurled it.
He held it up to the four directions.
Who knows why he did it?

The wind was so strong
it was shaking the top of the pole,
shaking it back and forth.
He stood up, that's what my mom said.
He stood up on the top of that pole and unfurled the flag
- the red, white, blue American flag.
He held it out to the four directions.
Why did he do it?

It looked like he would fall.
The wind was pushing the flag out like a sail.
It looked like it would make him fall down.
Why would he do something like that?

Risking his life. Getting splinters in his legs
shimmying up the pole bare-legged
without any ropes to hold him.
Standing on the cut off end
of a tree six stories, seven stories high,
shaking in the wind. So high up, if he fell,
and he probably would the way the wind was blowing,
he would crack his head in front of all his friends and tourists.

I don't know why he did it.
Some people do things like that,
for reasons you can't explain.
You just have to feel, from wherever you are,
you just have to feel, even if you are states away,
even if you hear about it over the telephone,
what it means to open a flag before everyone,
before everything you know, risking your life to the wind.
You have to feel what it unfurls inside you, billowing out,
the strength of the wind, the trembling humility of gratitude.

-A. Kramer

Summary. In addition to developing their ecoliteracy, students were interested in developing biocultural literacy by exploring nature and the human-nature relationship through a cultural lens. Students were interested in learning more about how their own cultural traditions view nature, and also in exploring how other cultures view nature. They were interested in studying religion, spirituality, and anthropology as a means of understanding culture. They were also interested in expressing and developing their own personal relationships with nature through artistic expression and reflection, and through direct intentional interactions with animals and plants.

Artistic Expression. When I asked Rebekah what she thought should be included in my hypothetical class, she enthusiastically exclaimed, "definitely art!"

The hands-on aspect of creating art was appealing to her, as well as its metaphorical aspect which she felt would help people to tap into their unconscious mind and therefore allow for a different kind of learning than is possible through analytical study. She clarified that for both artists and non-artists creative expression could be a useful way to study nature and the human-nature relationship because it spiritually connects you to what you're studying. Rebekah recollected that some of her best experiences exploring nature as a child were through artistic mediums. She came up with several ideas for how art might be incorporated into my hypothetical class. One project idea she had was for students to create masks of their own faces which would be decorated with items from nature that represented parts of themselves and could be used to form their mask faces. She also suggested a four part mask project in which students would trace themselves through the four seasons and find ways to represent themselves and their relationship to the natural world in each season. The spiritual aspect of this kind of project, Rebekah said, would come from seeing nature "actually incorporated into your face." She elaborated by saying that artwork involves the unconscious and brings together a person's emotional and intellectual selves. When I asked Rebekah if she would be interested in studying nature in a more biological sense and suggested as an example of what I had in mind that she might spend time studying the structure of plants or examining cells under a microscope, Rebekah said she would enjoy studying nature in this way if it was combined with art, so that she could make

“artistic representations of things I saw underneath a microscope ... and understand it that way.”

David also felt that including artistic expression in a class would be useful for deepening intellectual and emotional understanding of nature as well as for helping students to reflect on the human-nature relationship. He commented on how much he had enjoyed, and learned from, drawing plants and animals in his field biology courses. He felt it gave him a way to express the sense of kinship he felt for the organisms he studied, and it also helped his academic achievement because he was most engaged in his learning when he could creatively express himself. “The more I drew,” he said, “the more meaningful and expressive my [field] journal became.” In a marine mammalogy course David created a card game to help teach people marine mammal identification skills. He said it was a great project for him because it felt more meaningful than writing another report that would only be read by a professor. The project was meaningful to him because it was creative, and also because it could be used as an educational tool to “make kids laugh and get them excited about going to the ocean or aquarium to study animals.” This point illustrates how art is useful not only as a tool of self-expression, but also as a means of communication. As both, artistic expression can help us touch realms of human experience that are not usually accessible by academic communication and research-oriented scholarship.

Cultural study. Students were also interested in studying cultural viewpoints about nature and learning how different human communities relate to

the natural world. Some students had taken coursework in anthropology or religion which had helped them learn about diverse cultural traditions and understand how spiritual and cultural beliefs influenced people's ways of thinking about and interacting with nature. Some students had gained personal insights into their own relationship with nature by studying and exploring their own and other cultural traditions. The experiential as well as the scholarly study of culture was emphasized in their stories and suggestions.

When I asked David how a sense of reciprocity between humans and nature might be cultivated in a class or learning environment he stressed that for him it would be through exploring the ecological-spiritual interface. He suggested the class could start with an analytical study of religious ecological values, and then move towards practice, "cultivating and enriching it individually and collectively." He gave examples of a range of experiences that might help to foster this type of learning, from spiritual practices such as prayer walks and sweat lodges to farmers markets and outdoor schools. He emphasized that what he felt was most important was "experiencing things with a reflective mind and with an ecological/spiritual awareness." He explained that he thought this could lay foundation work for students to develop an authentic spiritual connection to nature, but he also cautioned that you can't fabricate a spiritual experience, only create a foundation for from which you can invite the experience to come. David likened this facilitated teaching style to the practice of providing students with tools that can help them to cultivate their relationship with nature.

As an Intercultural Studies major, David explored how cultures interact with the environment. He learned about the influence that religious views have on cultural frameworks.

The school I went to was a private school, so the dominant thinking was Christian-centered. I began to look at the Christian worldview to explore how philosophically nature awareness and environmental activism were related to faith... how those merged.

Studying cultural belief systems about the environment aided David in developing his own understanding of place and helped him to sharpen his own beliefs.

Rebekah spoke about a course she took on religion and the environment which explored how different religions have understood nature. For her it was interesting to compare these different perspectives and to explore how some religions regarded humans as having dominion over other species, while other religions viewed humans as having equal footing with other species. When I asked her if students explored their own belief systems in the class she talked about a group project she did with other women on ecofeminism. They worked together to create a women's altar which included elements like fire and water and plants. When I asked Rebekah if any of these classes had helped to strengthen her relationship to the natural world, she said she didn't think they had helped her strengthen it necessarily, but that they had helped expand her views, and reflect on them from a different perspective.

Spiritual Practice. In addition to learning about different cultural views of nature and how different groups of people understand their relationship with nature, students wanted to actively explore their own cultural roots and engage in active

relationship with nature in conscious ways. Rebekah mentioned an experience she had of gathering sage for a cultural ceremony in her traditional practice. She talked about how she felt the symbolic elements brought into ritual were powerful ways to provide students with a sense of how they are part of nature. She talked specifically about how engaging in group ritual in which an intention was set, or an offering was symbolically given back to the natural world, could be a powerful gesture. “I think it has to have some kind of ritual aspect to it,” she said, but clarified that such a group activity doesn’t need to be religious, simply intentional and symbolic.

I would see some kind of a...almost a creation ritual, where you would put together something beautiful, made out of flowers or found objects from the beach, some kind of group project where you’d construct something and then give it as an offering to the ocean...or even just that symbolic...making something beautiful and floating it out on the ocean, just having that symbolic feeling that you’re making the world a more beautiful place, or symbolically sending out your intentions. Just the act of doing some of those things ... feeling like you have a part in making the world better Just the small symbolic acts.

As another example she offered the suggestion of doing an activity like this at sunset, asking “how can that not touch you?” and then gave an example of a sunrise activity where people might participate in a day greeting ritual during a sunrise.

[A ritual] where you just set your intentions for that day, even if it’s just going around the circle and talking about what you want to do that day. Just being a part of the sunrise, it’s such a spiritual

experience that's not religious, that [doesn't] have any dogma or religious belief attached to it other than just being there and experiencing it.

For Rebekah, noticing the cyclical aspects of the natural world seemed to be especially meaningful as throughout her interview she commented on seasonal activities and here commented on taking notice of the times of day.

Like Rebekah, Dan mentioned the importance of engaging in group activities which reinforce people's connections to the natural world. He mentioned how people sometimes see the wilderness as a retreat, a place to go to get away from other people and the stresses of urbanization, and discussed how this image of nature as separate from people can either draw people towards spending time outdoors, or be a reason that people avoid the outdoors because they perceive it as separate from human experience. Dan felt for both of these reasons it was important to participate in group activities that engage humans in relationship to other parts of the natural world so that people can re-envision the human-nature relationship in a cultural, shared sense.

I think that there is a lot of power in going into nature with a group of people ... [and participating in] a group experience that's not strictly a human experience, that includes more-than-human experiences ... I think that's key because I think for a lot of people there is this huge nature-culture divide where people go out into the woods and they have solitude and then they come back to the world of urbanization and they're with people. And there's this real division ... I think it's really powerful for ... basically solitary people ... to really learn how to integrate those realms, and people who are entirely in the social, human realm have a lot to learn from

just going out in nature and learning how to feel comfortable in the woods. So I think there needs to be a balance.

David also spoke of wanting to explore how he might approach his own relationship to the natural world, declaring “I need a sense of the sacred in my education.” He had previously attended workshops on prayer walks that offered him guided experiences of solitude in nature, and facilitated spiritual practice, and he was eager to see this kind of practical spiritual experience incorporated into a class on the human-nature relationship.

Cultural Storytelling: Generational Knowledge. Another theme which students expressed was that of story and storytelling. Tim thought it would be a good exercise to practice telling stories after participating in nature observation, reflecting on what had been seen and experienced. He also spoke of the relevance of considering one’s mindset when observing nature, “teasing that out” and noticing how it affects “what you’re seeing and feeling.” Tim said, “I think story is an essential way to learn.” He also spoke about memorable experiences he’d had learning about nature in field biology classes in college, and how the social interactions he had with his peers made the experiences more meaningful for him. “I learn best when knowledge is placed in relationship to me personally,” he reflected, recalling one of his biology course field trips and how the social nuances of the trip had intertwined themselves in his memory together with the academic topic of vestigial terrestrial characteristics of aquatic plants. Tim spoke further about how stories helped him to give people a sense of being related to places and

other species, “a sense of kinship with nature.” He believed that having these relational stories helped people develop a sense of caring because they extended their sense of family to include plants and animals around them.

[If you understand] that’s my cousin, the bird, and I know because ... there’s this big story in which he and I are involved and once a long time ago we were brothers, and there’s this whole complex story with just this one bird, and that’s true for all the plants and everything you see around you, they’re all related in these complex stories to me, then I have to tread lightly in the world. I can’t just go tromping around and digging up stuff and polluting here and there. It really matters what I do, so that consequently you get a very different world where people are relating in that kind of way to nature.

When I asked Tim what kind of stories he thought would be important to bring into education, and what purpose he felt they would serve, he reflected further on the need to have stories which leave room for the mystery of the world, and for a sense of kinship between humans and the rest of the natural world.

Well, I think they serve many different purposes. One is, traditionally, these kinds of stories have served to guide behavior, morally. They served to preserve knowledge. They served to show you your place in the world. And they also revealed the world as a magical place full of spirit ... a great mystery. I think the stories have a lot of purposes, and it’s a mystery to me how to bring them back or write new ones. How we go about doing that is a huge thing you know (laughing) but I think it’s essential that we do because otherwise it feels like we’re in this desert landscape that’s a very arid and dry and very lonely kind of place if we don’t ... cultivate that kinship with nature, with story.

Students shared with me memories of spending time outdoors with family or friends where the social aspects of what occurred became part of how they understood their relationship with nature. In particular, they spoke of how they had learned stewardship ethics from other people. David shared memories of interacting with his mother and grandparents and being taught the importance of cultivation and preserving wildlife. He spoke of how he learned about gardening by working with his mother in their yard. In addition, his grandparents were teachers.

My grandma and grandpa had a big garden that we would explore and help in. Their garden introduced me to composting for the first time when I was in third grade. I remember my grandpa would use ash from the fire pit and mix it with my grandma's compost from the kitchen bucket. I had no idea what lovely organic strawberries that could produce at the time! But us cousins would go straight to the strawberry patch first thing and take their juicy rich flavor for granted by stuffing ourselves. That was always nice in the summers. My other grandparents would take us to wildlife refuges too, where I always looked for hawks and owls and woodpeckers. Yes, looking back at it, this was all a very good recipe for an early ecological education and nature awareness. It all came from my early experiences of getting my hands dirty in adventure with my brother and that was just fine for us ... I think we both know now that those were invaluable parts of our childhood, being able to connect to the land.

David also expressed how teaching students about protecting the environment had been a meaningful learning experience for him. When he saw his students take active steps towards protecting their forests, he felt personally rewarded.

Mindy likened caring for nature with caring for one's neighbors, asserting that a critical component was to actively nurture a relationship with the natural world, as one might actively nurture a relationship to one's neighbor. She talked about how the social isolation that keeps us from interacting with the people around us, is also extended to the natural world, so that we are socially isolated from nature as well. Mindy felt that in the same way we can consciously work on overcoming barriers that keep us in social isolation from one another, we can intentionally work on our relationship with nature.

As a culture we are more and more dissecting ourselves in some ways from different economic groups, different cultural groups ... we become so isolated in our own lives and our worlds, our own perspective, our own reality that we lose touch or ... even worse, never get to know the diversity of other perspectives, of other lives. You know your next door neighbor could have a totally different reality and until we get to know our neighbors, until we build community and learn to embrace that diversity and understand -- maybe we'll never be able to understand their lives -- but at least understand there's value in that, then we're going to have social dysfunction, and the same is true of nature.

Following along the lines of Mindy's comments, students shared with me some ways they directly expressed their affection and care for other species and the natural world.

Communicating with Nature. Students spoke of ways they engaged in direct communication with animals and plants. Dan thought it was important to explore "being in reciprocal communication" with birds and other animals, and

“building ways where people can begin to understand the language of nature”

so that they can become more aware of patterns in natural communities. He talked about how learning about how birds communicate with one another has helped him to identify greater patterns of animal movement in the woods.

I can be on the landscape and hear something happening with the birds and [recognize] there's something going on over there -- those birds are really worked up. [To] sneak over to that place and see a barred owl sitting in a tree or find bobcat tracks in moss is a very profound thing, to somehow step out of my own isolation of communication as a strictly human affair and start to learn how to reciprocate my communication, learn how to call to the birds, learn how to understand their voice.

Dan continued to speak about how this awareness has helped him to notice “synchronicities that happen in nature” and that he has noticed how animals relate to him personally, “showing up from time to time doing very strange things within my own presence that don't necessarily make sense.” Dan shared a few stories of how owls came to him in the woods at important times in his life, as if they had a message to convey. Paying attention to how animals are communicating with him, and trying to understand them, has given him a deepened sense that he is in active relationship with them, and that communication is trying to occur from both sides of that relationship.

There's no reasonable, logical reason why an owl would fly down and sit on a branch right next to me and spend time with me, but owls do that with me in the woods. Owls are attracted to me, and I'm attracted to owls, and there's a relationship that's there, and owls have shown up at very profound times in my

life to sit with me very close, within arms reach in the trees, and just sit there and call and share space with me and be present with me.

Dan said that he thinks that “seeing animals as co-conspirators in this great mystery and being in reciprocal communication with them” is common to many indigenous peoples but has not been an active part of modern, western culture. He felt it’s important for education to help students think about ways to bring reciprocation with nature into our linguistic and cultural practice.

Mindy reflected on an exercise where she observed birds, and noticed how her presence affected their behavior patterns. Having this awareness that she affected nature helped her to recognize that she was in relationship to other animals and that what she did mattered to them.

I think the most significant thing I got from the bird experience was this idea that we have energy that disrupts nature until we can find a place of calm and are kind of blended with nature and then we’re not intruders anymore. We’re not us and them. We’re together. I think that was the most powerful message I got from that day ... since then I’m not the same hiker as I was before.

Mindy explained that while previously she might have hiked through a landscape without thinking about how she was entering the home of other species, now she has a greater awareness and curiosity about what is happening in the wilderness areas she walks through, recognizing that by being present she is affecting, and affected by, other natural beings.

David and Rebekah both mentioned that recognizing the autonomy of other species has helped them to deepen their understanding of their role as humans, and given them an important sense of humility with regards to their place as humans in nature. David shared a story of finding a pair of endangered, wild falcons in Belize.

I went to search for the Orange-breasted falcon. The Orange-breasted falcon is highly endangered ... chances are it will be extinct in the next five or ten years. And it's a magnificent bird. It's exotic and beautiful, really an exceptional species, and it's very reclusive. It lives along the cliffs in these massive sink holes in the middle of the rainforests. They're often hard to access and find, so I learned about where this breeding pair was sure to be from some local friends I had made. They invited me to join them on a hike there one day to look for them since they knew I was really into birds. The group was more interested in climbing the cliffs to explore the forested bottoms of these giant sink areas, but me and my one friend were interested in seeing these birds. This was no ordinary hike this was a "jungle hike." We crossed rivers chin deep with our gear on our heads! And slipped down rock faces and jumped over snakes. It was more of a journey than a hike. So, when we finally got to the first sinkhole the falcons weren't there, so my roommate and I wandered off from the group and found another sinkhole nearby. And sitting out over the edge of this 1000 foot cliff face on a snag was perched this striking falcon. We'd stumbled into the pair and spotted the other one a little further off.

In the next moments, David describes encountering the birds, and how they affected him.

We walked right up to the edge at the base of that snag and this bird wasn't moved an inch. Both of

them sat up blinking at us, they weren't intimidated or anything by our presence. They just looked at us like they knew that this was their land, their kingdom, and they were the rulers of it. We were just guests, just there to visit them in their courts. There was something very spiritual about it. I can't describe it but the connection was spiritual, and it was very humbling. I don't know if it was just the rarity of the encounter or what. But it was something like entering another nation, another land, and these were like the regal ambassadors of that land and it was just very clear in my spirit that that's what we were encountering. So, yeah, that was a very impacting experience that knit me closer to the heart of the earth.

The sense of humility that David spoke of, and his feeling of being a visitor in the bird's home, is markedly different from his description of his experience of rescuing Red when he found himself in a position where he was protecting her. In the story with Red, David assumed a role of caretaker. In his encounter with wild falcons, he recognized himself as a visitor in the presence of another autonomous being.

Dan's story of being in the presence of owls alludes to this same type of encounter with another autonomous wild creature who chooses to be in relationship with a human. Rebekah talked about how there were ways she was taught to prepare to enter into conversation with nature when going on a vision quest to seek guidance from nature.

You have to prepare, and you actually do rituals around acknowledging that you're going out to talk to nature, like nature's out there waiting for you, waiting for you to have this conversation with it, and you set up all these rituals and activities that acknowledge that that's what you're going to do.

You're not just going out there blindly ... Your intentions are set to do these kind of things.

Tim spoke of trying to consciously cultivate a different awareness of the plants around his home, as he spent time working in his garden, “for me it’s a lot about spending time in my yard and cultivating plants, cultivating herbs, and trying to grow things, learning how to grow things, and learning to address plants as beings, address them with gratitude and thanks.” He clarified that he weaves together his scientific, analytical understanding of how plants function, with his more intuitive self, and discusses how studying indigenous knowledge systems has given him an appreciation for the different ways people can develop a knowing of nature. Tim shared one example of how his style of gardening has changed as a result. When he needed to transplant some roses and azaleas in his yard he took the time to observe where different plants were growing and to see where they might be transplanted to grow the best. As part of this process he also tried to gain wisdom from the plants directly by asking them where they wanted to be moved, and by asking the other plants to accept them in their new place once they had been moved. He added, “there’s no way I would have done that before, but I found it to be much more satisfying, far more satisfying spiritually and emotionally ... to have that kind of approach ... to have that respect for the plants as beings.” Tim compared this to gardening in which he would “just move things around like they’re chess pieces on a chess board.” Tim and David’s comments speak to how direct contact with wild animals and plants can instill a sense of respect, and an

awareness of the autonomy of other beings. This shift in consciousness is important for creating an ethic of sustainability that honors and protects all forms of life, and natural systems.

Rebekah also spoke about this same sense of inter-species awareness and conscious communication when she related a story of gathering sage with her Aleutian grandmother who taught her to pay attention to plants, and to pay them respect. Before gathering plants, there were specific cultural practices that were done to ask permission of the plants directly and to show them gratitude.

There was that reciprocity aspect that you were interacting with this other life force and it was different than just a commodity because you had to have some kind of a spiritual relationship to it, to have a conversation with it before you picked it. It would be used in some kind of a spiritual context. It was a whole cycle. I mean there was this whole interaction.

Rebekah's comments speak here to the dual acknowledgement that the human-nature relationship has spiritual and economic aspects. This theme of economic relationship is one that also emerged from my conversations with students.

Concluding Thoughts. Students were interested in exploring the human-nature relationship by studying cultural perspectives about the natural world through the lens of anthropology, religion and spirituality. Students were interested in interacting with diverse cultures, and particularly with indigenous cultures, and learning from them in the context of community service projects or conversations. In addition, to studying other cultural perspectives to gain a sense of the diverse

ways in which humans address their relationship to nature, students were also interested in expressing their own relationship to nature through art, story and ritual. In addition, students mentioned family stories that had influenced their views of their personal relationship to the natural world, suggesting it could be meaningful for students to explore family history and how their own families have historically related to the natural world as a way of investigating their personal and cultural relationships to nature. Several students mentioned powerful moments of connection with plants or animals where they recognized these other species as autonomous, spiritual beings, and defined their relationship to them accordingly. Students expressed an interest in exploring the spiritual dimensions of their relationships to other living beings, and practicing different ways of intentionally acknowledging and developing these relationships. Some were interested in class activities that would involve a group of students acknowledging together their connections to the natural world. In sum, students were interested in increasing their biocultural literacy by engaging in study and practice that would help them to explore the spiritual and cultural dimensions of their own and other people's relationship to nature.

Natural Economy: Practicing Natural Livelihoods

Summary. As we talked about a class that would address the human-nature relationship, students raised the economic aspects of this relationship. Some had experiences of gathering food or other items directly from the natural world and

found this helped to strengthen their sense of connection to the natural world. Some were interested in learning to grow or gather plants for food and medicine. They mentioned that a benefit of meeting basic human needs from the natural world instead of buying items in stores was that people would participate in the activities of the natural world more directly, and so would become more aware of their natural surroundings.

When Rebekah talked about picking sage with her grandmother she raised the economic as well as the spiritual and cultural dimensions of the exchange. The fact that the activity she engaged in had a relevant use was part of what placed her and her grandmother in spiritual and cultural relationship to the sage plants.

To me it seems really significantly different when I go out in nature and there's some kind of a spiritual component and there's an activity like picking sage or picking things from a garden, that there's a really relevant use, where then you go out and use those products...I don't know about products, but...I mean you can see and feel the whole cycle of life by how you rely on those things in the natural world to have an experience with them, do something with them, have them impact you, and see how your place is interacting with them, because, I mean, she would teach me the prayers and the proper ways to collect and that you didn't collect from one plant alone, that you'd spread it out, so you'd only be taking a leaf or two from each plant so it would continue to grow. And, so...I mean there was that reciprocity aspect that you were interacting with this other life force and it was different than [if] it was just a commodity because you had to have some kind of a spiritual relationship to it to have a conversation with it before you pick it. It would be used in some kind of a spiritual context. It was a whole cycle. I mean there was this whole interaction. It wasn't like just going to

the store and owning something and taking it and using it. It was like using it in a whole different way.

As was pointed out previously, Rebekah was taught by her grandmother to recognize this economic and spiritual exchange. She learned to give back spiritual energy through prayer, giving thanks to the plant as she picked leaves for her own use. In doing so, she recognized and acknowledged her part in the cycle of life, as well as the life of the plants from which she gathered materials.

Mindy talked about how an ideal class experience for her would include learning about how wild plants could be traditionally used for medicine. Dan mentioned how learning traditional survival skills like making bows and arrows and making fire from a bow drill had helped him to see how relying on the natural world to provide for one's needs shifts a person's perspective of their relationship to nature. He asserted that when people don't gather, hunt or grow food and don't build their own shelters from natural materials, or collect water or make fire then they experience "the illusion of separation between humanity and the natural world." He felt that learning survival skills helped to break down this illusion for himself, and he also observed the impact that learning survival skills had on other people.

I think the experiences that I've had with other people where we go out and we gather mushrooms and we cook them, we go out and we pick herbs and we make tinctures, we go out and we build a shelter and we sleep in that shelter, and nature actually provides in a direct and non-commodified way for our basic needs, that really sparks something in people. It's amazing doing ... things like fire by friction -- when

people get their first fire with a bow drill and they've been working at it for a week and huffing and puffing and smoke coming out and never getting a coal and then finally something clicks and they get a coal and it lights the tinder on fire and they make fire from nothing but whirling three pieces of wood together, people come alive ... something deep within people, I think, is yearning to reconnect with nature in that way where we get to play in the woods but we also get to forage for food and build shelters and make fires.

Rebekah felt that gardening was an important experience that should be incorporated into education. She talked about how a gardening experience should include not only learning how to grow food but also participating in observing the whole life cycle of the plants and learning to harvest and preserve the crops that are grown. She said that she felt that participating in the whole cycle of growing food and harvesting and preserving it helped people “to really feel where food comes from” which she contrasted to the experience of buying food in a store. “I just think that’s really significant,” she emphasized.

David talked about how time spent in school could be reoriented to contribute to a local economy. He mentioned that a mentoring experience could be set up at an organic farm where adults might work with younger students. Rebekah also had a similar idea, and an interest in working with different age groups. In these reflections David and Rebekah were talking about both the economic and social capital that could be produced from inter-generational teaching. David talked about the psychological reward that could be had from farming. “I need to nurture plants and see fruit,” he said, “not just as a metaphor, although that is very helpful

for reflection.” Later he talked about his own experiences growing up near a farm and a forest, and how he felt this was where his “true education” began. He explained his interest in farming as part of an educational experience that stemmed from his own early experiences living near farming culture. “That’s kind of where my roots are from,” he explained. “I think why the farm strikes me as an example is because that’s a direct working relationship with nature that’s not exploitive -- it’s a partnership.” For David, as well as other students, it was important to re-think how we relate to the natural world so that our relationships can be less exploitive and more reciprocal.

Responsible Technology. When I asked Rebekah what she would want to focus on to strengthen her own relationship to the natural world she said she wanted to work on simplifying her life and using more items from nature to meet her daily needs, items that were also imbued with spiritual significance for her.

... finding ways to ... simplify my life and use more things from the natural world that have a spiritual significance for me. I mean ... less dependence on supermarkets and that whole process, and finding more ways for me to actually go out and interact in the world and get my needs met and have a sense of community about doing it.

She continued by talking about how our current economic relationships tend to separate people from having a sense of being a part of life, and of life’s natural cycles.

It just seems that we’re so separate on a day-to-day basis, just going to the grocery store and just buying things and not having any connection to where they

come from, or any say in where they come from ... what's in our food.

Rebekah wanted to explore ways that she might use what she called “responsible technology” which would draw from both science and traditional ways of meeting human needs that respected the spiritual aspects of economic exchange.

I like the idea of being able to use technology that's less harmful, but making choices about what kind of technology we use, and what kinds of things we do ourselves. Kind of a mix of science and going back to the past, the way we used to do things...I'm not sure how to put that...minimizing our impact on the environment and still being happy and having the things we need and having a really rich life. Just being happy with less ... Those more simple things taking care of ourselves. Something that's more equitable to other people around the world that don't have as much as we do, so we don't use as many resources.

Rebekah wanted to learn scientific knowledge that had immediate practical applications which she could use in her own life to improve the economic and spiritual aspects of her relationship to the natural world to provide for her own needs in a way that was less harmful to the ecological processes she depends on. In her comments she referenced Mahatma Gandhi as an important figure who illustrated the relevance of self-reliance and simplicity in the contemporary world and had helped acknowledge the importance of learning practical skills as well as intellectual knowledge.

I'd like to learn more about things we used to know how to do, a lot more knowledge about plants and how to make things for plants, how to preserve things

.... and making things from your environment that's around you...and then learning about the science behind it There's a lot of scientific knowledge you could learn about the plants, ways to grow and collect the plants and make things that you wouldn't have to go out and buy. Learning about those kinds of things Responsible technology ... a lot of those Gandhian principles. I keep going back to all those things that he did with his own hands and teaching people to live in the world with just what's around you, together.

In the comments from Rebekah that I just quoted, she pointed out that our technology has powerful implications relevant to our social, ecological and economic relationships. She emphasized that using more “responsible technology” would change the way that people relate to the natural world on a daily basis, and would also affect larger issues related to our commodified economy.

Dan and Mindy also pointed out that a beneficial side effect of shifting to a more natural economy would be to increase the quantity and quality of people's engagement with other species and landscapes. Dan mentioned an experience he had gathering sticks for arrow making and how his awareness of the whole plant world sharpened as he looked for hazelnut sticks.

There was this one day when I went out to find an arrow shaft because I wanted to make an arrow. And I went up to Powell Butte, and I was looking for hazel bushes because hazel grows really straight shoots and they make really nice arrow shafts. And that day ... I've been to Powell Butte so many times ... that day of wandering through the bushes looking for an arrow shaft I had more intense connections with the plants and noticed more different kinds of plants in that one day of wandering and looking for an arrow shaft than I ever, ever had before. So it really

shifted my attention ... in order to find this perfectly straight stick [I needed] ... to look at every plant and bush in this entire area.

Mindy relayed a similar experience when she was looking for animal tracks in a riparian setting. By searching for something specific, her awareness of her whole environment was heightened.

Concluding Thoughts. While most students mentioned some aspect of their economic relationship with the natural world, they didn't tend to discuss it using the terms of livelihood or economy. They usually tied it to an expression of kinship and relationship, suggesting that they recognize it as a fundamental way in which humans take from and can give back to other species in an exchange of physical goods. It seemed to me that the comments students made about the economic component of their relationship to the natural world was sometimes based on a nostalgic sense of how they perceived people lived in the past, i.e. in Dan's discussion of survival skills he spoke of "modern" people as opposed to "indigenous" ways of doing things, and Rebekah talked about learning skills that "we used to know how to do." This suggested to me that students might not easily think about how they might currently make use of local, natural resources to meet their own needs now. When students talked about meeting their basic needs from the natural world they predominantly mentioned skills that related to gathering, growing or hunting food. Dan briefly mentioned building shelter and making fire for warmth. No one discussed other needs such as clothing or transportation. Only Rebekah explicitly discussed inventing new "responsible technology" which

wouldn't harm the natural environment. My sense in speaking with students was that this area of the human-nature relationship has a great deal of potential for a class to explore, particularly in thinking about how students might learn to reassess and change their own lifestyles and behavior patterns, and approach the idea of reciprocity with other species.

Critical Pedagogy: Knowing the Distances that Separate

Dissection

I recognize the face
in the muscle and bone.
In an unknown place
I recognize the face.
I used to trace eyes like these.
I recognize the face
in the muscle and bone.

-A. Kramer

Summary. As students spoke about what they would like to see included in a hypothetical class which explored nature and the human-nature relationship they discussed ways where they felt the university system, or society in general, works to disconnect students from nature and keep them from engaging in and strengthening their relationship with the natural world. They discussed how being required to sit in classrooms kept them separate from nature, even when they studied nature as a topic in those classrooms. They also spoke of how reliance on science as a way of learning about nature was problematic because in their opinion scientific culture arose from and supported a view that humans are separate from

nature. Students also raised how diverse cultural views, and community expertise was sometimes dismissed in university classes, and how disciplines artificially divided human experience. Students talked about how they generally met their basic needs by participating in consumerism, and not by relying on the natural world to provide for them. Finally, students mentioned that education wasn't holistic and inclusive of the whole range of human experience.

Indoor Learning Environments. As we talked about their nature experiences, several students shared how they felt disconnected from the natural world as adults. Dan expressed how graduate school had been the time for him that he felt most disconnected from nature because he spent so much time indoors, on the computer, or reading books.

I think it's important to note that right now, in this college program, living in Portland going to Portland State University I am less connected to nature than I have been potentially in my whole life ... definitely since going to college. I have less time spent in the natural world right now than I ever have before in my life.

Other students expressed similar sentiments. Mindy talked about how she thought it would be important to incorporate time spent in the outdoors into a class which investigated nature because students are generally not afforded those opportunities. I pressed Mindy about why students couldn't just go outdoors on their own time. She responded by stating that she thought students wouldn't take the time, given our busy lives. She thought it was important for this reason to bring it into the curriculum.

AK: [It] would be conceivable that people could develop [their relationship to the natural world] on their own time ...

MD: Mmmhmmm. But will they?

AK: ... that there would be opportunities for them to study other things at the university but that in their own time that they would have plenty of time to connect to their communities and ...

MD: Why do we have service learning then? Isn't that the same thing? Service learning connecting us to our communities through activities that connect us to different organizations and different groups of people and help us understand diverse issues, social issues. Wouldn't that be pretty much the same? That whole idea is not preposterous, you know.

AK: You were starting to say, but will they ... will they take the time to do it?

MD: And I know people do, but the reality is ... when will I get to go hiking again? University life is keeping that away from me in a lot of ways. Logistically it's not possible for me to get out in nature all the time. Logistically, well, the reality is that the university is a barrier to that instead of being a connection to it."

Mindy also spoke about how having shared classrooms limited the degree to which they could be modified by professors.

I just think about any classroom, and I think of the walls. No green, no plants, no warmth really You have professors moving from class to class to class. They don't have ownership of their space so they can't do things to modify that, to soften that Historically we would have been learning by being out there in nature, by being part of it, learning how to live in nature.

Mindy continued her discussion of the bland structure of a classroom by talking about how senses are connected to aspects of learning. She said she'd been noticing that the sense of smell is strongly connected to memory and had recently done a presentation on gardening in which she brought in a variety of herbs for people to smell as she spoke. She said that bringing in different senses really helped to connect people in a more immediate way to what they were learning.

Dan also felt that learning from textbooks, or field guides alone, was not enough. "I think there is a lot of education about facts and names and information about nature," he said. "And I don't think that's really what makes the difference." Dan continued to explain that it was important for students to develop both an intellectual understanding of their relationship to the natural world, and an experiential one. "I don't think that's really what makes the consciousness breakthrough for people to ... really feel and know their connectedness as a reality, not as a concept." He felt that the experiential component was essential for people to develop so that they could understand how they were a part of nature.

I see the style of education that really makes a difference is nature immersion, where we're really getting ourselves into the landscape, not so much concerned with naming things, although that has its place, but really breaking down the barriers that keep our senses closed down, and keep our bodies shut off from the earth, and really learning how, not learning, just doing, doing and being in nature. As opposed to walking down the trail and making notes about plants, taking off my shoes and wandering off the trail with a group of people is a totally different kind of experience. And that's what I feel like is more

important than knowing the names of things,
in so many ways.

Dan's critique of learning facts was in part a critique of standard environmental education which tends to be rooted in scientific knowledge and methods of inquiry.

Critique of Science Culture. Both students who had taken university level science classes and those who had not had strong opinions about the culture of science. Dan and Tim both brought up that the reductionist aspect of science can serve to sever human-nature relationships by not valuing the relationships inherent between humans and the rest of life. Tim shared how he felt a kind of "intellectual joy" in his college science classes that was shared with his professors and classmates as they explored the intricacies of plant physiology and other aspects of how nature works. "It was more of an intellectual joy ... intellectual excitement about learning...more head and more idea oriented ... it didn't have much to do with a love of nature, it was more like the excitement of learning cool ideas." He contrasted this kind of joy of ideas from the "integrated peaceful, joyful experience" he felt when he was just "being in nature."

Tim talked about how a naturalist approach to nature study appealed to him because it seemed to foster a more personal and intimate relationship with nature than he experienced in his science classes.

My heroes are the 19th century naturalists, and it may just be my romanticization of them, but the image, anyway, that I've had of what I've wanted in science education is something more like direct observation, being a lot more just in nature than in the classroom, and relating to it very personally, understanding

one's body and understanding nature and how the two interrelate, and a kind of love for nature, an affinity for nature, and a place for that. And the education that I had was so ... there wasn't a place for that, there wasn't a place for just wallowing in the glory of how beautiful something was, it was always studying it or experimenting, trying to figure something out. There's a kind of a beauty there as well ... and it was a lot of fun, too ... but overall I think there was a price to that.

Tim went on to explain that he felt the science he studied was separate from the rest of his life ... "separate from my life as a being ... as a person in my emotional life."

He expressed how this affected him negatively. "I think that separation took a heavy toll on me in terms of separating my analytical self and the rest of me, my body and my feelings ... doing that rather than really integrating the two."

When I asked Tim follow up questions on his experience of feeling separated, he explored how the disconnection he felt in science was also part of what he found attractive about the discipline.

It's interesting how you can take something like science education and it does feel very deeply personal ... I took a lot of science, and kind of went that route, working in the biomedical field for eleven years, well, how'd I end up doing that? To kind of backtrack ... I think one of the reasons that I went into science was for that kind of safety of being split off from my emotional side I grew up in an alcoholic home, and it was an unsafe place to be, and so a refuge for me was school and homework. And so science in that way was really safe, because it's not about emotions, it's not about feelings. It's about something objective, and I can just put myself into that and ignore the rest of myself ... my body, my feelings, my family and all that. So in a sense that

propensity that science has now of being hyper analytical and split off, for me was a refuge.

Tim raises the point in his comments of how the objectivity common to scientific study can be both an attractant and a repellant to students. This aspect of ignoring relationality and subjectivity that is common in science classes was conversely unappealing to Rebekah.

When I asked her why she hadn't taken science courses in school, Rebekah responded by saying that the approach of science didn't appeal to her.

I mean it's like a doctor going in with a group of medical students and discussing this pancreas case, when the person's sitting right there, and ignoring that they're a person, but saying everything physical and scientific about their disease without acknowledging that there's a living, spiritual person in that process....The way I look at nature is that it's a living, breathing, alive thing that has a spirit to it. It's not like an entity that you can just study and map out on a piece of paper and say these are the chemical components of this thing, and that's all it is.

I asked her if this was why she hadn't taken science classes, and Rebekah clarified, "I just don't operate on that kind of scientific, abstract, distanced, intellectual plane. I just don't like that kind of a place."

Rebekah's comment speaks both to the aspect of scientific study that requires the observer to separate emotionally from the observed, as well as the reductionist nature of some scientific investigation that can lose sight of the holistic, relational qualities of the observed. Dan also raised the point that reductionist science is concerned with separating connected parts of a system, and

understanding them in a separated context. He acknowledged the value of knowledge gained through this method, while also speaking to how it fosters the same cultural attitude that can lead to destructive practices.

I think there's a lot of knowledge that's been deduced by the scientific world view in terms of looking at nature but I think it can be a very reductionist way of seeing the world where science typically isolates one part of a living system and breaks it down into its simplest components and tries to gain an understanding by isolating organisms from the larger context of an ecosystem, and I think isolation and reductionism is at the heart of what is disempowering and destructive about our culture right now. So I see science as something that needs to be utilized in a way that we can gain from the understanding, but also really look at how does reductionism affect our worldview and how does science lead us to seeing reality as valid only when it can be measured, weighed and reproduced. How does that disempower the reality of our own experience, and how can we validate our own experience outside of scientific hypotheses that require reproduction and validity on those levels? And so I think that science ... using science as a part of a curriculum ... there are professors who have tremendous insight into animals and biology. I guess it's just to me about not getting pulled out of a holistic worldview and allowing understanding of parts and pieces to be part of that worldview and not be seen as the big answer necessarily to the problems that we face right now. So keeping it in context of a larger picture.

Tim similarly spoke about how he thought science would best be used as part of an ecoliteracy curriculum, and also felt it would be important to examine the cultural limitations of scientific investigation of the natural world and to blend science with other more relational ways of knowing about the world.

I think some people have problems with that, but for me, there's kind of a realm that science knows about and that's the realm that it knows about, and then, what's outside that realm, science really can't say. There are those who would say, well, what's outside that realm doesn't exist, but for me it's just another way of knowing, and that's kind of what I've been studying ... indigenous ways of knowing, of learning, and understanding the world. To me, they're much more integrated because I can use all parts of myself to relate to nature, so I can use that analytical part, like ooh, how does photosynthesis work? or what's the name of this plant? how is it related taxonomically to this other plant? or animal behavior, ecological relationships ... there's that whole analytical part that I can use, and that's part of me, and that's one way of relating, but in an indigenous ways of knowing allow for other parts, they allow for that energetic relationship or for that spiritual relationship, where there's something happening that I can't necessarily describe or name or point at, but that feels very real, and kind of an emotional connection as well, that those can be there as well in an indigenous knowledge system, and in a scientific knowledge system, it's not there yet.

Tim continued by speaking about how Fritjof Capra has been using a systems science perspective to bridge the gap between mystical thought and quantum physics, but noted that "the vast majority of scientists aren't there yet." Tim talked about how in the future he envisioned that science might be taught in such a way that it would be used only to discuss certain realms of reality, without dismissing other realms.

I think indigenous knowledge is more expansive in that non-linear way in that it has part of it that can be perfectly linear and logical, but that it's not captivated by that and beholden to that, and kind of enslaved to that type of thinking. And most of the

science that's taught today is kind of enslaved by that thinking rather than that being a tool. It's become an all-consuming paradigm, rather than a paradigm where it's useful now, but then we can shift to another paradigm when it no longer works.

Tim felt that indigenous knowledge systems were more facile than western science in their ability to move from explaining one aspect of reality (physical) to discussing another aspect (spiritual) with ease and in an integrated fashion.

Towards the end of Tim's interview I asked him if he thought there might be a way to practice science that was more relationally oriented, that was mindful in the same way that he had tried to be mindful to the rose plants he transplanted in his garden.

AK: Do you think that it would be possible, kind of in a similar line to you talking about transplanting the roses. One approach is you take the shovel, you find a spot you want to put them in where it looks nice, you dig them up and put them there and that's it. But you were saying for you it was a much more satisfying process to actually connect with the plants, to ask and to be in relationship ... recognizing your relationship with the plants in that process, to you that was more satisfying.

TH: Yeah. Yeah.

AK: Do you think that there's a way of doing science like that?

TH: Yeah, well, I think science has an important part in it, because I think it's important to know the science of what I'm doing, too, know ecosystems and ecological relationships, and know soil conditions and acidity and all those things, that knowledge and that way of knowing fits very well together. It's kind

of like this is, for me, this is like the other half that helps complete the experience.

AK: Do you think there is a way of integrating that, of bringing that idea of consciousness?

TH: Yeah.

AK: Because that's really kind of altering, I mean in science you're taught to be objective. We're taught that we can be objective, so that approach is really counter to what you just talked about.

TH: Yeah. Well, I think the key again is to recognize that there's no complete objectivity ... I say the key is gratitude. And we don't have to get all religious about it, but before beginning a class just being grateful, and saying something like "Well, what's here? The frog's here ... Let's just for a moment, let's just be grateful for the frog." Just settling down instead of [saying] "Let's launch into it from the cortex." [saying] "Let's just be grateful for the frogs that are here. We're going to take their lives and we're hoping to learn from them." I think that's a great way just to plant a seed. Just to do that, would be really helpful.

Tim also spoke of how he would like to learn from an ecologist who understands and acknowledges the limits of scientific knowledge, and recognizes that there are other cultural ways to approach thinking about and studying nature.

An ecologist, who really has that solid grounding and [can say] this is what we know, in ecology, and here are the limits of what we know, instead of acting like the edge of what we know doesn't exist, or no other culture has anything to say about it. But, somebody who has the humility to say this is the edge of what we know in terms of ecology and science today and maybe we will know more about it in science at a future date, but here's what other cultures say about

beyond the edge of what we know, or even about what we do know.

Tim added that this is the kind of class he would enjoy teaching as well.

David spoke about how the culture of academic science can also be disconnected from politics, activism, and community life. He shared his experience as an undergraduate when he discovered that science students weren't necessarily interested in participating in environmental stewardship or protection. He gave an example of how he would invite his biology peers to participate in campus environmental events and they didn't want to because it was "political."

It just seemed to me part and parcel of being a biology student -- that you would care for the earth and want to be committed to changing things and doing clean-ups for example ... and it just threw me for a loop because I just thought it was a natural outflow of being a biologist. But, it really wasn't. That was when I began to learn that those were two separate categories for many people, and ecological activism was something way out there for a lot of hardcore hard science students.

David's realization that scientists, and science students, weren't necessarily committed to looking at how they might affect social change, resulted in his identifying himself "more with the people who were involved and those were more folks on board with sociology, and some biology students, but a lot of people who were interested in cultural change and cultural awareness." This ultimately led him to explore the academic avenues through which he could study social and cultural issues, and led him to changing from a biology major to an intercultural studies major.

Cultural Disconnects. Like Tim, Dan reflected on how the human-nature relationship was impacted by cultural oppressions and human abuses. Dan discussed a phenomenon he had observed where people become “incredibly good naturalists” as a result of socially isolating themselves from other people because they have had experiences of being hurt by other people. He also felt that some of the cultural oppression that leads to people separating from one another along racial, ethnic, religious, class, and cultural boundaries is connected to our attitudes about the natural world.

There's a tremendous amount of unspoken fear that people have towards strangers and towards people that look different than one another. And also the landscape. People see the wilderness as a hostile place and the thought of being alone in the woods seems dangerous and people don't even know what their lives would be like if they would spend more time in the woods or have more of a connection with nature. So I think the kind of education that I want to see happening is about ending people's isolation. It's about breaking down the barriers of fear that people have towards one another and towards the natural world and giving people invitation to really connect with each other's humanity, with themselves, with their group, with each other, and with the natural world if we saw and we valued one another's humanity it wouldn't be ok what was going on right now. And if we were really in love with not only ourselves and with each other but with the natural world it wouldn't be ok what was going on right now. So I think it's about ending our isolation and finding practices that connect us with the core of ourselves, the core of one another's humanity, the core of being part of a natural, living system ... higher education as a means of emancipation for people to really understand how their lives have been affected by domination and institutionalized oppression and

privilege and separation from the landscape and from one other ... [to] build a culture that is a healing culture ... based in healing, ending isolation, and building a sense of intimacy with ourselves and with one another. And really not just talking about that but actually doing it.

Dan acknowledged that this way of thinking extended the idea of what is normally considered as part of a university education. He noted specifically that it is counter to a competitive system that rewards individual achievement through a grading system, and recognizes people for having the “best ideas.” He also commented on how the university system is set up so that there is a competition for resources that is counter to cooperation. He felt that programs in sustainability, like the LECL program in addition to deconstructing issues such as social inequity, they could begin to “reconstruct a healing culture.”

[A healing culture] that takes us beyond our isolation and builds genuine intimacy with life, the full spectrum of life, and starts to disengage with systems of oppression and destruction that are taking our power, our life force and power.

Dan’s thoughts paralleled those of Mindy who also recognized that there was a similarity between the social isolation of cultural groups from one another and the isolation of people from the rest of the natural world. Like Dan, Mindy felt it was important to try to actively overcome those isolating factors by engaging with different cultural and natural communities.

Economic Disconnects. Students discussed how economic interests also served to disconnect people from the natural world. Dan discussed how he felt

economic and intellectual resources were often misused for developing technology that had detrimental affects for the ecological fabric of life.

There's a lot of science that's happening that just seems tremendously unnecessary to me, where it's not geared towards the betterment of learning how humanity can cooperate with nature, it's more geared towards just gaining pure understanding that doesn't necessarily apply to the crisis, global crisis, that we're in right now. And the amount of intellectual capital, and money being spent, and time being spent, and expertise being spent on science that doesn't address the global crisis, like the greatest mass extinction this planet has ever seen. Scientists need to be figuring this out, and what we can do now to deal with it, instead of figuring out what industry needs next or researching something that's going to be put into a file and never looked at again.

Dan's comments speak to the need for economy in how we use all matter of resources, including our own minds. This has relevance to education because much of the learning that occurs in higher education is based on exploring theoretical models or imaginary situations, and is not connected to real world situations. The practical applicability of lessons is not always apparent or relevant to students' lives.

Tim expressed that he saw "the spiritual part and the connection with nature and the kinship with nature," as being essential parts of the human-nature relationship. He thought it was important to focus on this because he felt that "some of the green things being done like global energy credits, green building, even permaculture ... [are] being done from that mechanical ... cut off place, rather than from a respectful, kinship place."

Disconnected Disciplines and Teaching. Students also spoke of how they felt that the disciplinary approach to education served to disconnect areas of knowledge which were intrinsically inseparable in the real world. Both Tim and Dan mentioned that their interest in science was countered by their desire not to get too narrow of a perspective. Tim said that when he was choosing between graduate programs he was looking particularly for a program that was interdisciplinary because he was frustrated with the specialization that occurred in the sciences.

What I was looking for was a program that thought the way that I thought. Outside of the box. Interdisciplinary. [As an undergraduate] I got in trouble because I took too many courses outside of my major: art history, psychology and anthropology and religion and all these things because I think they're fascinating ... they're all part of the human experience.

Tim said he felt something was wrong with that system which punished him for having interests that spanned disciplines, and he questioned why he had to decide between studying one subject or another. "This specialization thing is driving me nuts, you know and especially in science that's the only way to really get ahead is to be a specialist, is to have the scope of your knowledge become narrower and narrower and narrower and narrower until you're studying nematodes for 25 years." I suspect that Tim's frustration at having to choose between disciplinary areas of study came in part because it forced him into studying topics that became increasingly separated from his own lived experience. He contrasted this to an indigenous knowledge system which preserves "very intricate, specialized

information,” but “preserves it so that everyone knows it” not just a particular group of people, and which teaches knowledge that is relevant to people’s lived experience.

When I asked Dan if he felt that disciplines like anthropology or humanities had a place in nature education at the university level he replied by saying he felt the university system created a “conundrum” because it separated the real world into distinct categories that didn’t naturally exist.

It’s a conundrum because I think at the university level what’s valued is expertise and what’s rewarded is expertise, but to become an expert in something basically a person needs to isolate themselves within a discipline, ignore other systems of knowledge and ways of seeing the world and learn everything they can about strictly anthropology, strictly wildlife biology, strictly social sciences. And life doesn’t work that way We need to draw from those layers of expertise but I think that we need to collectively get over the egocentric idea that expertise is going to save us, that somehow isolating ourselves within a discipline is going to address the collective cultural, ecological mess that this culture is in because expertise doesn’t build a holistic relationship between disciplines and how to put them into practice ... that’s beyond academia.

Dan’s comments draw attention to how the disciplinary approach that the university system is based upon can serve to distance the university from community life and experience on the one hand, and on the other hand develop communities that are dependent upon expert knowledge to solve their problems. David touched on the gap between disciplinary knowledge and real world application in his comments also.

One of the reasons David told me he changed his major from science to the social sciences was because he wanted to be able to study “social systems as well as biological.” He also recognized that a science education wouldn’t allow him to explore his activism as much as a social sciences degree would. This speaks to a further separation that occurs across disciplinary lines, and is also mirrored in the university’s relationship to the larger culture. Typically, social, economic and ecological perspectives are taught in distinct disciplines. They are also sometimes disconnected from community life and issues. A few students mentioned an interest in blending artistic expression with science. David had an experience where he was able to draw as part of his field journal, and enjoyed the class more because of it, but ultimately he felt his science courses kept him from exploring other important aspects of life he was drawn towards. Interestingly, for him, his love for the natural world was intertwined with his desire to protect it and understand the cultural reasons why the environment was being compromised. His interest in biology and the social sciences were integrated in his own experience of the world in a way they were not integrated in his university classes.

Concluding Thoughts. Some of the ways in which students felt the university system contributed to detaching people from the natural world included indoor classrooms, book-based learning, a lack of cultural perspectives, and disciplinary divisions that kept knowledge compartmentalized in ways that didn’t correspond with the real world. Students were also interested in learning practical skills including skills which have intentionally been kept out of higher education

because they are seen as not having intellectual or academic value. Particularly, folk knowledge and skills related to human physical and cultural survival are often seen as inappropriate material for inclusion in higher education. When students did talk about practicing ritual or learning how to make medicine from plants, or exploring interspecies communication for instance, they tended to also discuss how these activities could be linked with other learning exercises more likely to be seen as scholarly, like science or historical research. I suspect this is because students recognize that it is controversial to discuss bringing community-based knowledge into an academic setting.

Holistic Education: Creating Systems of Relationship

Summary. In their interviews students consistently talked about how an educational experience might be constructed such that it reinforced and developed relationships among people as well as between people and other natural beings. They felt it was important to create educational experiences that drew from different areas of knowledge, connected experiential and intellectual scholarship, linked the university to community life, and enabled students to engage with diverse groups of people. Students wanted educational experiences that were interdisciplinary, multi-sensory, project-based, place-based and created a diverse learning community that permeated the boundary of the university/community divide. They felt strongly that the pedagogy, as well as the content, of a class which approached the study of nature and the human-nature relationship was important.

Interdisciplinary Learning. Students explicitly, and implicitly, discussed how they would like to see a class on nature draw from multiple disciplines including the natural sciences, social sciences and humanities. Rebekah felt this was important because “it’s more holistic ... less fragmented.” She explained, “the problem I have with a lot of classes is that they just focus on one little thing. They come from a particular stance, and it’s so abstracted from the whole I don’t think I get as much out of it.” Rebekah elaborated by saying that an interdisciplinary class that includes artistic expression and scholarship can be “more dynamic and transforming” for a student because it is more complex. “There’s just all those different aspects interwoven,” she explained, “and I like those kinds of classes that are interwoven with everything.” Rebekah thought a class that integrated the humanities, social science and natural sciences would help her to increase her awareness of herself in the natural world. Rebekah gave an example of a class activity which involved a group ritual to symbolically acknowledge that humans are connected to the natural world. In this example, she also talked about how it could provide “a multidimensional course of study that had everything in it: the science, the writing, experience with other people ... increasing your awareness of how people live together in the world.” She emphasized that there should be a “social justice aspect to it” in addition to a focus on the environment.

Tim told me that he looked for “a massively interdisciplinary program”

when he was exploring graduate programs. He wanted it to include science but also social sciences and cultural perspectives.

I knew that nature had to be there and the environment, so I was looking at Environmental Science programs and Environmental Studies programs because they seem to be the most interdisciplinary ones that studied nature but also brought in the human element. But the ones I came across, they're interdisciplinary in the sense that you studied some science and ecology and then maybe you studied public policy or something like that, but it was pretty dry. It wasn't studying cultures and story and native peoples and those kind of things as well as the ecology.

Tim said he was attracted to the Leadership in Ecology, Culture and Learning program at Portland State University because it incorporated all those aspects, and provided flexibility “to study what I wanted to study, the spiritual connection and how that manifests and how to regain that.”

Multi-sensory Learning. Several students mentioned that environments which stimulated many of their senses were more effective, and comfortable, learning environments. When I asked David to share some of his most memorable experiences of learning about nature, he immediately began to discuss how his sensory experience played a large role in these experiences, mentioning the feel of a rabbit's ears, and the smell of condors. Mindy also discussed how memory was tied to her senses.

I don't know if everybody is like that but I remember a lot of things because of the smell. I remember being

at Grandma's house and smelling the food and how her sheets smelled when I stayed the weekend at her house, and Grandpa's aftershave ... And I think about how my pets smell, they all smell different, and there's emotion attached to it, you know, and with emotion is memory They're all connected to emotions and if they don't have emotions connected to them, we probably don't remember them. Unless they have too much emotion and then we intentionally block it out. But, that's powerful, I think. That's a powerful opportunity for learning.

Mindy talked about how learning environments that stimulate multiple senses are more emotionally nurturing. David discussed how including physical movement can be an invigorating way of enlivening a learning experience. He recalled a learning experience that included physical exercises, "that was very impacting for me, being centered and in our bodies and together and grounded in the rest of what was going on around us ... I liked that connectivity." This brought to mind Mindy's comments about some of her university classes that met outside and by doing so provided a multi-sensory experience that heightened her learning in the class. Rebekah and David also both mentioned wanting to be involved with hands-on learning. One of the appealing elements of studying sustainable farming for David was the opportunity to be physically engaged in his learning. Rebekah said my hypothetical nature class would need to "have some kind of kinesthetic aspect where you're bringing in your five senses and actually working with things that are living and growing." "I have to have my hands in it," she said, "I have to smell it and see it."

Project-based and Place-based Learning. Many of the suggestions students shared with me for what might be included in my hypothetical class on nature were project-based, place-based ideas. David discussed how project-based learning was important because it engages students in practical, meaningful work. He provided an example of a group of students who became involved with a project on the freshwater shrimp of the San Francisco Bay. The class incorporated watershed monitoring, research, writing, civic responsibility and political engagement. Rebekah also suggested class projects that would investigate local culture and ecology. She suggested studying salmon, a keystone ecological and cultural species in the Pacific Northwest, as a way of entering into an exploration of cultural, ecological and management issues. Mindy also discussed how a multi-disciplinary, multi-cultural approach that used “methodologies of different disciplines as well as different cultures” could be used to study one chosen element in nature from diverse perspectives.

You might even have a class that studied one thing and looked at it from different perspectives, like one tree ... A Native American might have a story on how it came to be and what its future is ... but science would have a different idea. Maybe somebody from a culture that has very few trees would have a totally different idea. I think that would be very fascinating to have this idea that the same thing can have different stories for different people and have different meanings.

As mentioned previously, students were interested in interviewing and learning from members of diverse cultural groups within their larger communities.

In addition, students discussed investigating wilderness areas and working on farms as potential activities for my hypothetical class.

Learning Community. Students pointed to examples of how the learning community developed within a class could help to strengthen cross-cultural relationships as well as inter-generational relationships. Students felt an important part of the learning experience was developing relationships with their peers and teachers that could provide them with insights into cultural views different from their own. This would obviously necessitate having a diverse learning community.

Since Rebekah's academic interests involve investigating how to create learning environments that are inclusive to indigenous students, I asked her to share some of her thoughts about how cultural inclusiveness might inform a class on nature.

AK: What do you think would be some of the issues in teaching ... culturally diverse people ... in terms of teaching about nature?

RL: I think you could do that with ... I'm sure there's people ... in the Hispanic community or in the Russian community ... there's all different ethnic groups of people that would have things to say about how they interact with nature and their beliefs around that. If you found people that were knowledgeable ... I think it would be really interesting to have a conversation with say a curandera -- there's one who makes a big white flower wreath for weddings -- there's just all this different cultural stuff that's connected with plants and just having people talk about that. It would be different from science, but people usually have a lot of traditions about how they're connected to the environment. I'd just like to hear about somebody's experiences like that, their

beliefs. It would be interesting to have a lot of different speakers who could talk about their cultures. I think it would be really neat to listen to a curandera talk about how they collect their medicines ... that whole cultural context, or natural artists who use reeds to make tule mats There are a lot of cultural things I'd be really interested in hearing somebody from that community talk about.

I asked Rebekah to consider how the educational system has been un-inviting to people from diverse cultures, and reflect on its relevance to a class on nature. She responded by saying that she thought it would be helpful to use a humanistic and cultural approach to study that drew from and included student's diverse backgrounds.

In addition, she thought bringing in community members who represented various cultural traditions could be a way to bridge cultural gaps of knowledge, and educate students about different approaches to sustainability. She noted that inviting cultural experts to participate in a class would also serve the purpose of recognizing and validating their knowledge base.

AK: What about ... you were looking at some of the ways our educational system creates a schism for people who are coming from different cultural traditions, coming into a university that has certain implicit beliefs that don't jive with where they're coming from. I wonder if you have anything to say about that, thinking specifically about the way that people relate to the natural world?

RL: I keep thinking some kind of an art/poetry/literature class around the environment. Some way you could express yourself on an artistic/spiritual level [coming] from your cultural beliefs but still have the focus be on the environment.

Like environmental writing from a cultural standpoint, or through poetry or visual arts or interviews with people from different cultures I think there's a way to bring in all that really diverse - just the fact that you would present knowledgeable people from different cultures and give them a voice in the classroom and let them come in and talk from an expert stance and validate that that was worthwhile -- just having somebody like that come into a classroom does that.

Rebekah thought this kind of an activity could be linked to academic scholarship by linking it to academic research, community-based research (i.e, interviews with community members) as well as written assignments.

Many of Rebekah's ideas for my hypothetical class on nature and the human-nature relationship involved social dimensions. For her, it seemed that the learning community was a critical component to an educational experience, as it can provide a rich wealth of information and insight into not only the intellectual thoughts of others, but also their emotional frameworks. Rebekah talked about how she felt that the really transformative educational experiences she had often came out of dialogues with her learning community.

I feel that sometimes in my classes when we have really lively conversations with other people we grow closer to them as people. Even though you're just sitting in a classroom you're having all these great conversations and you're getting beyond what people just think, but how they feel about what they think. You're making these personal connections with people when you're discussing academic things, and somehow they start to become part of your life, and you learn from their ideology about how they are in

the world, and see people that are examples, and want to live like they do. I think it's more than just intellectual.

Rebekah's comments raise the concept of learning through imitation. Peers and professors don't teach only through sharing ideas, but also by sharing their experiences and serving as examples to us of different ways to embody ideas that may be new to us.

Rebekah also discussed the importance of multi-generational learning, and talked about how she would enjoy having classes with people younger than herself.

Everybody's so segregated, according to age, I think it would be really fun to have different generations of people learning on different levels, but together. I'd be really interested in being in a class with say, junior high kids, and then ... part of it could be separated ... but there's some things that both groups could learn together. Just that interaction and maybe having one of the kids be one of your mentees, where you'd work together on a project, to me that's kind of like the natural world, inviting the different generations of people to learn together. Kids are so full of great ideas, I'd really love to interact with kids.

Rebekah shared how multi-generational learning communities could participate in field trips together or work on community projects with one another. This was similar to David's comment about how youth could work together with university students on farming projects. Rebekah also was interested in learning from older generations. When she discussed her idea of learning about salmon and studying with local tribal groups, she mentioned that she'd be interested in learning from tribal elders.

I'd be really interested in some Warm Springs grandma talking about going out and collecting roots and how they teach that to younger people, how they take them out to collect roots, and how they cook the roots and different things, and the different native plants, to talk about that, and the times that they go out to collect and how they know how to do that. It'd have to be this really trusting kind of thing ... There's so many experts out there, if you could gain their trust, and not be exploitive.

Rebekah was interested in not only learning about ecological knowledge from tribal members, but specifically in learning about how they teach and pass on their traditions. Her reflection on the etiquette necessary to establish trust between people so that information might be shared in a culturally appropriate and respectful context is also worth noting.

Dan also discussed the sensitivity that exists around sharing knowledge across cultures, and expressed that he felt there was "a need for collaboration ... with anybody who has a solid understanding of how to live in harmony with other people and with other landscapes." Dan referred to all people as having "indigenous" roots and talked about how he thought it was important to not idealize the past as a time when people lived in perfect harmony with one another and with the environment, as this wasn't the case, but that it was important to recognize that the scale of the current human-caused social and ecological violence that is occurring now is unprecedented. He felt that traditional cultures modeled ways of being that could be helpful in navigating the present time.

In addition to these comments on the importance of being culturally respectful, students also raised the importance of creating personal safety for students within a learning community. Tim brought up a class he had as an undergraduate in which he felt he couldn't freely share his ideas and experiences without framing them in a very specific intellectual way. He found this restricting and intimidating, and it greatly affected his ability to participate in the class. After reflecting on what made the class feel so unsafe he shared some of his thoughts.

It was that in that class what wasn't being discussed was how are we as a group of students and the professor relating to each other in the here and now ... we'd be talking in my class intellectually about how we were relating to Michelangelo's work or Dante or political ideas but [we didn't talk about] how are we now relating to each other, who's being heard and who's not, who's speaking and who's not and why are they not? And does everyone feel safe? Do you feel safe to talk about these ideas, to discuss them?

Tim felt the class missed "this layer that's really important the group that you're learning with, that's an important layer to acknowledge and to bring out and to discuss, to talk about." Tim illustrated how this affected him by saying that, "for me talking in that kind of group was like pulling teeth and it took me the longest time to have the confidence to talk about my opinions" He elaborated on why it didn't feel safe by pointing out that the culture of the class focused on student's intellectual ideas alone.

It wasn't an environment where it felt safe to not have full proof behind my ideas before I expressed them -- to be able to brainstorm things, think by speaking, it didn't feel like it was a safe environment.

So, I think that's another layer that needs to be in place in our educational system to really get the most out of it.

Tim later contrasted his experience in this class with his experience as a graduate student in the LECL program. He said one of the aspects of the program that had been "extremely beneficial" to him was that his professors and peers were "fascinating, interesting, heartfelt people" who exemplified for him that it is possible to be both "really bright and intelligent" and also "really caring." He felt that it had provided him with living examples of "the kind of person who can think complexly ... and love the world, and care about people."

Many students also commented on how it was important to approach other parts of nature with respect and generosity -- plants, animals, the ocean. David talked about this aspect of relationship when he discussed working on a farm. He felt that in an indoor classroom, there wasn't a possibility to have "a partnership that's direct with nature." Part of what was appealing to him about farming was that it "makes those hidden connections direct and open." David felt that this was an important orientation for education to have. "I think making education ... direct and explicit about revealing our connections and relationships, is the best starting point," he stated.

Dan reflected on the kind of role he would like to have as a teacher and facilitator of learning experiences for others. He felt it was important "to guide and facilitate people, clarifying that this was different than a lecturing teaching style. This kind of teaching would involve dialogue, "but not one person talking - all of

us talking and really connecting as a community.” Dan summarized his thoughts by saying, “building up networks of connection are so central to life, rebuilding those with people and rebuilding those with nature.”

Concluding Thoughts. Throughout their examples, students spoke of their desire for education that is engaged and active. They wanted a learning environment and pedagogy that embraced the complexities of life and human experience, and allowed them to interact with natural systems and human communities. Students felt it was important for them to have opportunities to interact with people who embody sustainability practices and principles, as well as have opportunities to learn from people of different generations. This suggests that students believe effective education about nature and the human-nature relationship should be both theory-based and experience-based.

Value of Hypothetical Class

Finally, I asked a few students what they thought the value would be in studying the human-nature relationship. Their answers indicated that they felt the value was in helping students connect their own actions to concepts of sustainability. The following excerpt is from Mindy’s interview.

AK: Do you think it would be important for students who are looking at sustainability issues to have an awareness of their personal relationship with the natural world?

MD: Well for sustainability there are huge benefits. Everything we do has an impact on nature and thinking about, you know, having a class like that

would put things into perspective. And I often think, you know, that it's something we have to be reminded of, even though we know it. It's not something that you can just take in one class. There needs to be a reminder threaded throughout the program that keeps bringing things back to this place and weaving it in. So I think it's really important.

Rebekah had a similar answer, though more to the point.

AK: What do you think the value is -- for students interested in sustainability, sustainable lifestyles, looking at the whole way our global society is put together ... what relevance would it have to study, on a personal level, one's relationship to the natural world?

RL: I think it would change the way you interact with things."

Reflections on Student's Interviews

Throughout their interviews, students commented on what kept them separated from the natural world. They also drew out specific ways in which educational experiences can be designed so as to recognize and strengthen relationships that people have with one another and with the natural world. I think it is worth pointing out that many of their examples do not require additional resources or funding. They make use of local resources, and local sources of knowledge and skills. The hypothetical class which I presented to students involved learning about nature and the human-nature relationship, but within this context students drew in all aspects of sustainability: cultural/social, economic and ecological. When I asked students to think about developing a class that would

focus on just the human-nature relationship they naturally extended their thinking to include a multitude of relationships. This suggests that focusing on the human-nature relationship may be an effective approach for simultaneously addressing all aspects of sustainability – conceptually and practically. While students pointed out that disciplinary thinking separated areas of study from one another, they quickly and easily connected a variety of topical areas when we discussed how to approach the “human-nature relationship.” In closing I’d like to end with Mindy’s quote which I think sums up well the majority of students thoughts on how to approach a class on nature and the human-nature relationship.

I don’t think, until we embrace nature, and feel like a community with nature, that we can be sustainable. You have to care about something. You have to care about it to the core. You can’t just say, oh yeah, I really hope my neighbor’s ok. You have to interact with them. And the same is true of nature. You have to interact. You have to have that deeper meaning -- that deeper connection.

CHAPTER IX

REFLECTIONS, RECOMMENDATIONS, AND QUESTIONS

A woman wraps a piece of golden silk yarn around a small grey stone.

“Rivers,” she says, in response to the question, “What do you want to sustain?” At a conference for environmental professionals, Tim and I are explaining sustainability education -- trying to illustrate it through our words and actions. We are building bird nests again. I have brought baskets of stones and colored yarns of silk and wool; also, branches, grasses, flowers and feathers. Tim reads a statement he has written defining “sustainability education.”

The way that we educate children and adults how to live on this earth such that life is sustained rather than degraded needs to have the following characteristics: (1) It needs to reflect current research on the multiplicity of ways that people learn; (2) This curriculum needs to be inter-disciplinary spanning the historical and artificial divide among the academic disciplines; (3) It needs to be developmentally astute recognizing that individuals at different developmental stages have differing needs; (4) Lastly, such a method and framework needs to be humble and open to other ways of knowing, especially those ways of knowing kept by indigenous peoples. It needs to be rooted in the wisdom that we are all connected to each other and to other animals, plants and the whole of Nature. Humans are not separate from nature. We call this way, this path, sustainability education.

Attempting to model what we mean, we ask the participants to read what others have said about sustainability, handing out quotes printed on pieces of paper. We listen as voices fill the room with insights from anthropologists, scientists and educators such as Wade Davis, Janine Benyus, Vandana Shiva and Wes Jackson.

We ask participants to answer the following questions

and instruct them to

(create meaning)

“What do I want to sustain?”

hold a stone

(genetic memory, life)

“How have I been taught to sustain it?”

wrap yarn around a rock

(egg albumin, shells, nourishment from our

caretakers)

“How can I teach others to sustain it?”

collectively weave a nest of branches, flowers, words

(story, community, practice, culture, biomimicry)

As an emerging field, the lines of sustainability education are still blurry, like the soft wings of a monarch breaking free of its cocoon, still soft, pliable and damp with possibility. I say emerging rather than new because I believe the true definition of sustainability education is old, timeless and common. It emerges each generation from cocoons spun to provide safety and room for slumbering, for dreaming, for transforming who we are -- cocoons of thin, sticky, hard-to-see threads.

As I researched master's programs and spoke with students about the kind of education they would like to have I was impressed most by the ways in which students and faculty conceptualized sustainability as a field which crosses academic disciplines and historical divides between community and university life. I began to imagine sustainability education as education that brings to light the connective threads between what seem to be disconnected areas of life; the "ah ha!" factor that helps us to recognize what we already know, because it is what we are experiencing in our daily lives -- in our families, work places, institutions, minds and bodies. Towards the end of my research, during the time I was entrenched in analyzing the interviews and information I had collected, a fellow graduate student shared a story in a class on sustainability education that helped to clarify the elements of sustainability education for me.

Joe Bergen recounted a personal experience as a way of challenging a statement made by one of the authors we were reading, who claimed that science

education was the most effective way to teach children about the environment, and asserted that, “most of the people I’ve met who are emotionally bonded and committed to the preservation of the natural world have been scientists” (Krapfel, 1999). Joe questioned the validity of Krapfel’s statement by telling a story about a day he went hiking with a boy he mentors.

Spiders

I couldn’t just talk to him for hours about spiders - what they do and why they do it. All that science, he didn’t want to know. He would have walked away. He was the kind of kid, when we played ball he always threw it over my head on purpose so I couldn’t catch it. And then he’d laugh at me. The tipping point came one day when I took him on a hike. We found a spider web, holding onto raindrops, glistening. For hours we looked at spider webs. We didn’t get far, walking on the trail, suspended between basaltic rock cliffs, cracked into branching designs of short, straight lines connecting the place we stood to a tumultuous past of lava and mudslides. They were everywhere, all these spider webs! We must have spent three hours just looking at webs and spiders. We didn’t talk about spiders, though. We just watched them. Sometimes you can’t say what you want a person to learn. You can’t even point to what he should look for. If someone comes to you with questions all you can do is try and catch the ball, just to make an effort. It wasn’t his fault - throwing a ball so no one could catch it - his father hit him, used drugs, who knows how far back that question goes? You can’t just tell somebody what you want them to know. Even if he comes to you with a question, if you answer he’ll just laugh at you and throw it back higher over your head. Mostly we don’t even know the questions we ask or why we ask them,

until the answer

is everywhere

caught and thrown
 caught and thrown
 caught and changed
 to

like those spiderwebs stretched out in front of us,
 like the little round body moving through air

“How?” “How do they do it?”

Sometimes
 all you can do
 is be there
 to look
 when he
 points to the
 answer

on the branch, gluing silk
 to the underside of a leaf,
 a brown spider

and keep looking

oh it's falling through space! -
 how scary! what will catch it?

until the answer

that tiny branch

turns into the question

“But how did it *know* it wouldn't *fall*?”

he can answer himself,
 and he reaches out a hand to yours,
 eyes warm and shyly smiling.
 That's what I learned that day,
 out in the Gorge,
 watching spiders with this boy.
 After 2 ½ years of trying
 it was the spiders who made us friends
 connecting dissonance,
 making meaning out of chaos,
 spinning resilient threads.

After that day we got along great.
He learned to see the lines between us.
I learned to teach like spiders.

- A. Kramer

My poem embellishes aspects of Joe's story. As Joe described hiking through the Columbia River Gorge I recalled my own hikes through this landscape – remembered the basaltic cliffs and their cracked designs that resemble spider webs. I reflected on the ways I have also learned about trust by observing animals in nature. Because Joe's story was grounded in a landscape that was familiar to most of us in the class, it immediately brought to life all of our own experiences in that landscape – it tied us together. Furthermore, his story powerfully expressed how nature education is related to social problems – and can help to heal them, if we understand nature study as an opportunity to study our own natures. The facts of Joe's story are that those hours of watching spiders and spider webs allowed a boy and his mentor to connect in ways that had been unavailable to them before. Joe's point was that if he had taken this boy to the Gorge with field books and tried to teach him about the science of spiders, nothing special would have happened. His story speaks to the other lessons that nature has to teach us. They are lessons about how to live well, with a respect and awe for life, and a trust and love of one another. I think they are the lessons of sustainability education.

In recent decades there has been much international attention on sustainability education. The work of the Earth Charter Initiative has provided a

theoretical foundation for defining sustainability that is based on common principles found in contemporary international law, science, religion and philosophy. While the Earth Charter Initiative (2000) lays out the guiding principles of sustainability, the work of the United Nations Educational, Scientific and Cultural Organization (1997) and others (i.e., World Commission on Environment and Development, 1987) have provided useful working definitions of sustainability education that can help to guide educational efforts aimed at teaching people the skills, values and knowledge necessary to organize our economic and social structures so they are congruous with supporting biological and cultural diversity, social and economic justice and human rights.

In the United States, university leaders and educators have drafted declarations, held conferences and prepared reports which provide a direction for sustainability education efforts in higher education. Among these, the *Talloires Declaration* (1990) and the *Essex Report* (1995) stand out. These higher education initiatives call for interdisciplinary, experiential, inquiry-based methods of instruction; they call for curricular content that that develops an ethic of sustainability, ecological literacy and systems thinking. However, many university systems have had difficulty in grasping and implementing suggestions for changing curricular content and pedagogical approaches to reorient education towards sustainability.

My study is intended primarily to provide insights that inform practice.

My work attempts to ask questions and generate answers useful for informing the curricula and pedagogy used in sustainability education in U.S. universities and colleges. It is also intended to inform discussions of sustainability and ecoliteracy that will have relevance to how sustainability education is pursued at all levels of education and in nonformal as well as formal settings. I have structured my concluding chapter to reflect the action-oriented nature of my work.

I will begin by discussing the limitations of my research and what I have learned from the process of research, itself. Then, I will discuss what I feel are the key findings of the cumulative research I have done here. Finally, I will provide recommendations to university faculty and leaders and community educators based on these key findings.

Searching for Answers, Finding Questions:

Research Process and Limitations

One of my early concerns as a researcher was that as a member of the community I wanted to research, I could not “objectively” ask questions of students. They knew me. I had taken classes with a few of the students, and had spoken in informal, social contexts with most of them. Furthermore, as is true of any community, ideas flow from one person to another, shifting collective community understanding. I wondered if I would be able to collect information from students

that was not “tainted” by my own beliefs and influence or that was not simply a regurgitation of what we were studying in our classes, mirroring the philosophies of the authors and teachers from whom we learned. As I went through the frustrating process of trying to design my research so as to minimize this effect, I began to recognize that my attempt to collect “pure” information was based on the same ideas of extraction that I had studied in my *Collaborative Ethnographic Research Methods* class. I was looking for a way to extract the true essence of what students believed and experienced. This, I realized, was immobilizing my research. I gave up on the idea that I would be distanced from my research, I gave up on the idea that I would not influence and bias the results, and I gave up on the concept that the students I spoke with would share ideas with me that were “purely” their own, anymore than my ideas are purely my own. Another concern I had regarding studying my own community was, as one of my classmates said, “You can’t just toot your own horn.” I didn’t want my research to revolve around promoting my graduate program, or holding it up as an ideal. To do so would not only have questionable integrity, it would also miss what is of most relevance and value in studying my program, or others like it, they are works in progress. The flip side of this concern was that of “airing our dirty laundry.” As a new program, LECL has its fair share of problems. In fact, one student, who had reached a point of exasperation with the program as a whole refused to participate in my focus group, concerned that it was an attempt to falsely advertise the merits of the program. We

are a new program, a new community, we have big dreams, and we are working on putting them into practice. It is for all of these reasons, that I finally discovered the type of role I felt most comfortable taking with regards to my research was rooted in tradition, and my own past, as much as academic scholarship.

In my elementary school, my classmates and I were visited weekly by an old woman with white hair named Mrs. Summit. She did not own a car, so she walked the dirt roads and hitched rides to get to our school. Because she walked everywhere, and because she wore sandals, her toenails and her feet were gnarled, cracked and stained in varying shades of gold and brown. If you have ever seen one of those country dolls with gingham dresses, and faces made of dried up, peeled apples, then you know exactly what her face looked like. If you haven't, suffice it to say it was very wrinkled. When Mrs. Summit came into our classroom all of us kids ran out of our chairs to give her a hug, and after she had shushed us and gathered us up into a circle, perhaps taking a puppet or two out of the brightly woven bag where she kept such things, and selected one or two of us more persistent children to sit in her lap, Mrs. Summit would look out at us from her blue, sparkling eyes and glasses and would begin to tell stories. She gathered these stories from everywhere, all over the world - from South America, Europe, Africa and Asia, and from the villages where we lived.

Snow

the old woman
with white hair

says

white

snow

shake
the comforter
hard

let the snow fall out in feathers
let the world below be blanketed

One of my favorite stories she told was that of Mother Holle. Much later, I realized the story comes from Northern Europe, where my mother was born. My favorite part of the story is where Mother Holle tells the young girl who is visiting her to shake out her featherbed every morning so that the world will have snow - snow that gives the moisture necessary for life. I think I love that part of the story because it speaks to how our own actions have large impacts on the world, teaches us that we are connected to natural cycles of weather, and to people in places we do not know and will never meet. But, I digress. It was from the position of a storyteller that I finally decided to approach my research.

Storytelling is an old art form, one I haven't perfected. It is useful in that it collects anecdotal information, accumulated through lived experience, and reflects it back to a community. In so doing it offers a view of ordinary, daily experience as part of a larger fabric of lived, human experience that includes all times, all places, and all stories. Storytelling is a process of creating meaning, meaning that comes from a community, and is given back to a community. It is concerned with truth, but it does not claim to tell the truth. It attempts to provide insight, to dig

down, to see hidden meanings and how they might connect to seemingly random events. Storytelling has always been a communal process. Stories do not belong to the storyteller. Even the storyteller who tells the story, does not own the story. The knowledge contained in the story is informed by the whole community of life (human, plant, animal, mundane and divine). The storyteller's role is to synthesize it and reflect it back to the community. What happens from there is the work of the story, not the storyteller.

Viewing myself as a storyteller freed me to converse with students with more ease. It also gave me free reign to follow what seemed to be relevant lines of the story, even when they diverged from where I intended the interview to go, or veered from the questions I thought were relevant. As a storyteller, I tried to be attentive to the communal story which wanted to be told, rather than trying to tell my own story. In this way I tried to use my position within my community as a point of strength, but not one of authority. I revisited the question of influence when I conducted the focus groups. With more people involved in the conversation it was clear that students were influenced by one another's ideas. Even though I ran the focus groups with more structure than the individual interviews, the students collectively reoriented my research questions. Both groups independently shifted from my focus on ecology to address issues of language and communication, which indicated to me that these issues had emerged within the LECL community collectively and independently. While it was tangential to my interests in ecology it

was relevant to the community story I was trying to tell. As a researcher, I found myself drawing both from my training in science as well as my practice in writing poetry. Science works with averages and community norms to find out the weight of a story. Poetry is often concerned with the outliers, margins, the forgotten, missed, obscure details of life that can, when positioned correctly, become a single drifting feather catching the eye, shifting attention and the perspective of a story, adding layers of freshly fallen snow.

In my research of other programs, I was limited to document analysis as I could only use the information I was able to collect from afar to evaluate programs. While all programs had information online, their websites were dissimilar in the type, quality, and quantity of information provided. In order to overcome this disparity, I attempted to make contact with program faculty and staff to help fill in the gaps. This proved quite helpful in some cases; some of my contacts eagerly and enthusiastically shared with me their syllabi and course descriptions and patiently and thoroughly answered my questions. In other cases, due to professional time constraints (and, in one case, unwillingness to share detailed course information which had been plagiarized in the past) my contacts were only able to provide limited information. For these reasons, I feel the depth of my analysis was somewhat compromised. Ideally, I would have loved to have had the opportunity to visit with each program, observe classes and immerse myself in the experience of their respective learning communities. However, due to budget and time constraints,

this was not possible. Working with the information I had, I tried to be cautious in my interpretation of the work of these programs, rather than to make assumptions that might prove inaccurate.

I did not intend to evaluate the effectiveness of any of the programs I reviewed. In addition, the student interviews or focus groups were not meant to assess or evaluate the LECL program, and I did not directly ask students to evaluate the LECL program. However, I did ask students to talk about what they would like to learn about ecology, and how they would like to be taught about it. And we did discuss what they thought would be the best way to organize the ecology component of our program so as to best meet the needs of students. In some cases this prompted students to make evaluative comments about the program. Some of these I included in my analysis, others I did not. I think evaluating the LECL program, and the other programs I studied is important, however I felt it was beyond the scope of my research, which I saw primarily as a means by which to dialogue, and document current thinking among students and faculty. Further, I felt that as a current student in the program, it was lacking in integrity for me to evaluate the effectiveness of my own program. I was more concerned with generating ideas that could help form its development. I do believe that it is important to conduct assessments of the effectiveness of these programs, but I think this could best be done using a combination of student and faculty perspectives from both within and outside of the communities involved. It should also involve

long-term qualitative and quantitative analysis that brings in the perspective of the communities where these institutions are located and with whom the students interact (i.e., organizations, businesses, schools, diverse citizens) and tracks alumni and their effectiveness at shaping sustainability culture within their respective communities.

Along a similar vein, one of the lessons that I learned in conducting this research is that knowledge is a dynamic process. The ideas that I present here were ideas that individuals shared with me months ago. It is possible that their ideas will change, or have changed already. As I am sure will my own. I call attention to this because I think it is important to recognize the fluid nature of learning and communities. One of the purposes of storytelling is to remember where we have been, so that it can inform where we are now. By identifying students by name (with their permission) I hoped to both credit students with their ideas, and provide LECL community members or other interested persons the opportunity to follow up with them to further discuss the ideas they presented here, with the intent that this might help the LECL program to continue to dialogue and grow. That said, I would hope that anyone choosing to do so, would approach the study participants with respect, and with the understanding that they may not be interested in further conversation about their ideas. Being transparent about the identities of my participants places an added responsibility on them, and on myself. For them, there was more impetus to be certain they have told the story they want to tell. For me, I

was more aware that I should interpret their stories with care, as any flaws in my interpretation can be more easily identified and pointed out. In both these respects, I think it made my research more careful, and more truthful.

Key Findings

My research questions, listed below, asked how programs designed to prepare students to educate and provide leadership for sustainability are practicing sustainability education, and how these practices might help to inform and define higher education's approach to sustainability education. My study also asked how educators can best teach about nature and the human-nature relationship so as to promote a culture imbued with sustainability values. The two sets of questions that drove this study were:

Can education/leadership programs in sustainability provide useful models for university education as a whole? What philosophies and pedagogies have they embraced? What program structures are used? In what ways are the three aspects of sustainability (ecology, society/culture and economy) addressed? How are leadership and education defined in the curriculum?

How might sustainability redefine ecoliteracy? Does ecoliteracy for sustainability differ from environmental education? How might sustainability education expand the way educators teach about nature and the human-nature relationship? What does the new generation of sustainability educators and social

change leaders say about this? How do they want to learn and teach about ecology and the relationship between humans and nature? What kinds of ecological knowledge and skills do they feel are necessary to create a culture that will support sustainable decision-making?

Sustainability Education Models for the University System?

The programs I reviewed address the issues of sustainability within an education or leadership framework. In other words, they are looking at training a new generation prepared to transform our culture into one that embraces social justice, economic equity and ecological health as keystone dimensions for our survival. University leaders and faculty are similarly trying to create a culture of sustainability within their own institutions. For this reason, I was interested in seeing how these programs might provide insight in how to create a culture of sustainability within education that could be useful to the larger university system. The graduate programs I reviewed have several characteristics in common that I think may be relevant to discussions for how the larger university system might successfully approach sustainability education in the United States. They institutionalize their commitment to sustainability, reinforce sustainability values in their pedagogy, provide curricular depth and breadth, and transform the practice of leadership.

Institutionalize Commitment to Sustainability

All of the programs I reviewed clearly state in their marketing material that they are committed to working for social justice and ecological health. Further, they state that they are committed to using education as a tool for personal and social transformation. While these commitments may seem unnecessary, they do make an impression upon faculty, staff and students as well as the surrounding communities within which such programs are located. Institutionalizing the values of sustainability is an important step in creating a university culture that is adherent to the goals of sustainability.

Reinforce Sustainability Values in Pedagogy

The programs I reviewed are committed to reinforcing sustainability values through their pedagogy as well as their curricular content. They do this by emphasizing community-based learning, respecting students multiple roles, including diverse perspectives in curriculum, creating strong learning communities, developing a permeable university-community boundary, and focusing research to serve the needs of local communities.

Community-based learning. The programs I reviewed all emphasize community and collaborative learning. They provide opportunities for students to work with local organizations, bring community speakers into classrooms, and take students out of the classroom in order to facilitate community interactions and dialogue. In addition, these programs recognize that students learn from one

another. They facilitate cohort bonding through group work, intensive seminars, celebrations and social activities, residential programs that require students to live and study together, and non-residential, distance learning programs that allow students to live and work in communities where they already have strong roots. This focus on community learning fosters the same skills and attitudes that will help students to work collaboratively with others in a variety of roles. It also values knowledge gained through the lived experience of individuals and communities.

Respect for lived experience. This respect for lived experience is evident in program structure that supports students' multiple responsibilities to family, work and academic life (i.e., weekend intensives and distance learning opportunities). It is also present in pedagogy, exemplified by assignments that ask students to engage in self-reflection, discuss their own experiences, and listen to those of others. In using self reflection and community as text, these programs draw from a history of activism and social movements that have utilized consciousness-raising personal and community dialogue about lived experiences as a means to raise awareness and develop theory relevant to real life. For example, they blend critical, feminist pedagogies with traditional academic teaching models. Feminist scholar bell hooks (1994) explains the importance of this teaching approach in her book, *Teaching to Transgress*. Quoting Catherine MacKinnon hooks says, "we know things with our lives and we live that knowledge, beyond what any theory has yet theorized." Making this theory is the challenge before us. For, in its production lies the hope of

our liberation, in its production lies the possibility of naming our pain -- of making all our hurt go away” (p. 75). In relying on grounded theory as well as theory that comes from philosophy students are given freedom to explore the nuances of theory with respect to its relevance to their own lives.

These programs recognize and validate the expert knowledge of community members who are working outside of academia by bringing them into the classroom as visiting faculty, or by taking students out into the community to work with them. This approach helps students to develop what Prescott College refers to as the “scholar-practitioner,” someone able to utilize knowledge so as to benefit their community. Emphasizing the importance of building personal relationships and social capital is an extension of the philosophical underpinnings of these programs. Beyond the human community, some of these programs also ask students to reflect on their personal relationships to other species and the natural world, extending their discussions of community to include biological communities.

Recognize cultural aspect of sustainability. These programs have been designed to focus on the cultural aspects of sustainability. As mentioned, they recognize that the roots of sustainability education lie in both social activism and scholarship. In their pedagogy and curricula they are bridging the gap between scholarship and activism and drawing from critical pedagogy to critique social structures. These programs, with their focus on education and leadership, prompt students to examine how the educational system (and other institutions) support

classist, sexist, and racist power dynamics that work against social justice ideals. They engage students in exploring alternative methods for creating knowledge (i.e. participatory research methods) as well as sharing knowledge (i.e. teaching) that support social equality, and also make critical links between environmentalism and social justice. The university system as a whole could benefit from addressing how leadership, research and education might be transformed to help create an educational culture rooted in sustainability values. The interdisciplinary courses of these programs provide examples for how courses in disciplines as diverse as physics, literature and psychology can address the cultural aspects of sustainability in their courses by simply including some of the interdisciplinary texts that these programs utilize. This would offer an easy way to incorporate discussions of sustainability's cultural aspects into all areas of disciplinary study.

Provide Curricular Depth and Breadth.

These programs are modeling how sustainability education can provide both depth and breadth. The programs provide a broad approach to sustainability issues by bringing in community experts, offering cross-departmental courses, and structuring programs with built in flexibility so students can design their courses and program. In some cases, students choose concentration areas that focus their studies on specializations such as food systems. Some programs have been built upon existing programs, infiltrating curriculum with a sustainability perspective. In these ways, these programs illustrate how universities might reorganize themselves

to bring sustainability issues into existing programs and courses with relatively little effort.

All of the reviewed programs are interdisciplinary and include exploration of ecological, social and economic aspects of sustainability. However, they vary greatly in how much each aspect is addressed. Overall, ecological and social aspects are emphasized more often in the curriculum of these programs than are the economic aspect of sustainability. Ecology is most often taught as a single discipline, often in courses with a science-based, natural history focus. The programs incorporated social sciences, natural sciences and to a limited degree the humanities (literature). Art, music, dance, poetry and other forms of cultural expression are largely missing from the curriculum of these programs, both as aspects of culture to study, and to practice, although several of these programs have begun to explore the relevancy of cultural expression to sustainability. This comes into their curriculum by way of studying diverse cultures and their relationships to the environment primarily from anthropological perspectives. In some cases, ritual and ceremony is also used as a way of creating meaning and shared community experience. These programs could further explore how creative arts like theater, art, dance and music might be used as a means by which to convey cultural values that support sustainability, by providing students with opportunities to explore creative scholarship. The UNESCO definition of sustainability states that humanities should be central to a curriculum aimed at creating a culture of sustainability (UNESCO,

1997, paras. 69-70). Overall, this is an underrepresented area that could be explored in much more depth. This is an area in which these programs might be able to model future pedagogy for the larger university.

Transform Leadership

Recognizing a need for cultural leaders who will work within communities, educational institutions, non-profit organizations, government agencies and businesses these programs see education and leadership as important to the curriculum. The skills, knowledge and values that they have collectively identified as important for developing teaching and leadership abilities include group facilitation, community organizing, conflict resolution, teaching, curriculum development, systems thinking, organizational theory, educational theory and history, multicultural education, environmental education, educational reform, learning communities, cross-cultural communication and appreciation for human diversity. These programs are steeped in a culture of activism, that makes use of the lessons for leadership that have arisen from the environmental, feminist, labor, civil rights and indigenous rights movements within the United States as well as abroad. University leaders interested in creating a culture of sustainability at their institutions could likewise examine how leadership roles in the university might be used to facilitate community dialogue about what it would mean in the broadest sense for the institution to embrace sustainability principles as well as practices, addressing issues of social justice, diversity, and equity alongside efforts to green

the curriculum and university operations. Furthermore, leaders can ensure that faculty and staff receive professional development trainings and on-going support in creating a culture of sustainability that is reflective, responsive, and inclusive so that it can best serve all members of the community.

In his book, *Whose Reality Counts?*, Robert Chambers (1997) discusses new methods of research that acknowledge the power imbalances prevalent in development work and attempt to shift this by placing the researcher in a facilitator role that recognizes a community's strength to analyze its own problems and develop and enact solutions. He sums up the challenges of actively shifting power dynamics to place "lowers" in positions of leadership in his closing chapter.

The challenge ... is to the powerful, to the structures of power It is to upend the normal, to stand convention on its head, to put people before things, and lowers before uppers. Imbalance is needed to establish balance. So children come before adults, women before men, the poor before the rich, the weak before the powerful, the vulnerable before the secure Reversals [in power relationships] would be absurd if pushed to anarchy, dismantling the state, abolishing bureaucracy, removing all rules and controls. They would be improbable if uppers had always to lose. They would be immoral if driven to extremes which made lowers into new uppers. But what is sought is not revolution. It is reorientation, retaining some hierarchy while loosening constraints and freeing actors. (1997, pp. 210-211)

How Can Sustainability Education Redefine Ecological Literacy?

David Orr has described education for ecological literacy as education that is concerned with both the "substance" and "process" of learning at all levels (Orr,

1992, p. 90). He emphasizes that education which provides people with the skills and knowledge necessary for participating in sustainable living, will rest on six fundamental principles: (a) “all education is environmental education;” (b) “environmental issues are complex and cannot be understood through a single discipline or department;” (c) “for inhabitants, education occurs in part as a dialogue with a place and has the characteristics of good conversation;” (c) “the way education occurs is as important as its content;” (d) “experience in the natural world is both an essential part of understanding the environment, and conducive to good thinking;” and (e) “education relevant to the challenge of building a sustainable society will enhance the learner’s competence with natural systems” (pp. 90-92). Orr asserts that ecological literacy is based on a tradition that counters the forces of modern society.

This tradition emphasizes democratic participation, the extension of ethical obligations to the land community, careful ecological design, simplicity, widespread competence with natural systems, the sense of place, holism, decentralization of whatever can best be decentralized, and human-scaled technologies and communities. It is a tradition dedicated to the search for patterns, unity, connections between people of all ages, races, nationalities, and generations, and between people and the natural world. This is a tradition grounded in the belief that life is sacred and not to be carelessly expended on the ephemeral. (Orr, 1992, pp. 93-94)

Orr contrasts this kind of education -- education that aims to connect people to places and deepen their understanding of how they are connected to natural systems, with more common approaches to environmental education. The latter tend to focus

on finding solutions for particular environmental problems, rather than addressing the underlying cultural assumptions and behaviors that generate them.

The programs I reviewed are concerned with the cultural aspects of sustainability, and with recalibrating human societies so that humanity is better integrated into the healthy functioning of natural systems. As I reviewed these programs I was particularly interested in looking at how they addressed ecological literacy in their curriculum and pedagogy. There was a wide range of approaches. Ecology was sometimes taught in conjunction with the social and/or economic aspects of sustainability. It was also taught in combination with education and/or leadership. Ecology was also often taught in separate courses that examined ecological principles or natural history. These programs draw from environmental studies, biology, and ecology in teaching about the natural world. Some included studies of indigenous knowledge systems, and studied cultural diversity in how the human-nature relationship is defined. Students in some of these programs were asked to reflect on their own personal relationship to nature. Most programs did not require outdoor experiential learning about the natural world, but the Audubon Expedition Institute made this a central part of their curriculum.

My discussions with LECL students suggest that students are interested in learning about nature from a multidisciplinary perspective that would include outdoor learning, scientific research methods and critique of science, traditional knowledge systems, responsible research and technology. They would like to

explore the human-nature relationship by learning how this relationship is understood by diverse cultural groups (i.e. people from various ethnic groups, religious traditions, livelihoods, etc.). They want to participate in activities that would help them to strengthen their personal connection with the natural world and help them to feel that they are a part of ecosystems. These would include exercises that help them reflect on their own personal and cultural connections with the natural world and express these through creative expression. In addition, they are interested in developing their abilities in nature observation, habitat restoration, permaculture and similar skills related to human and environmental health.

Use the Natural World as Classroom and Text

In their stories, many students shared moments they had of feeling strongly that they were a part of nature. Overwhelmingly they wanted experiences like this to be a part of their own education. These feelings of affinity arose from time spent in nature, particularly for extended periods of time. It also came from recognizing their cultural, familial and spiritual connections to nature and exploring what those meant for them personally. In addition, students talked about childhood connections, contemplative practice and practical skills such as gardening, farming or restoration work. Some spoke of an extended sense of self, of feeling connected to the earth in ways that brought to mind the work of Lynn Margulis, James Lovelock and others who explore the boundaries between living organisms and shatter our notions of being bounded individuals. (Lovelock, 1988)

Many educators and naturalists have discussed the importance of childhood connections with the natural world as being necessary for developing a love for, and therefore protective feelings towards, the natural world. Gary Paul Nabhan and Stephen Trimble explore the many ways that children feel themselves belonging to the natural world in their book *Geography of a Childhood* (1994). E.O. Wilson (1994), who coined the term, “biophilia” talks about how his own affinity for the natural world began at an early age, and influenced his career as a biologist. David Sobel speaks to the developmental necessity of having children spend time in nature to develop affinity for the natural world (1999). Sobel suggests that the most critical component to developing a child’s affinity for the natural world is time spent in nature with an adult who can demonstrate how to participate in having a relationship with the natural world.

As I listened to my peers speak about their experiences, particularly Dan, I couldn’t help wonder if time spent in nature at any age, and time spent learning from mentors at any age, are the critical components to developing a sense of being part of the natural world, a sense of kinship with other life. As adults, these students felt most aware and connected to nature when they were able to explore or observe what was around them. This kind of unguided immersion is exactly what children experience when they go outside to play. As children, we allow our attention to wander through our landscape. As adults, time spent simply wandering in nature without a specific agenda (such as a hike or a scientific study) is rare.

As I listened to students describe the sense of peacefulness they felt when in nature in an unstructured way, for extended periods of time, I reflected on my own explorations of the natural world. When I feel most at home, and most myself, I am connected physically in some way to the natural world that is not composed of human-generated mental and physical structures. The sense of affinity with nature I sometimes feel is what drives my own desire to protect the natural world from human injury. It is the extended feeling of self that lets me know that when a river is polluted, or habitat is destroyed, that I am personally harmed. It is the quality of feeling that lets us recognize, as Thich Nhat Hinh (1991) says, that “the sun is our second heart, a heart outside of our body” and “if it were to stop shining, the flow of our life would also stop” (p. 103). It gives us a sense that we are, as Mary Oliver (1986) says, “part of the family of things” (p. 14).

Spending time in nature as a child generally involves movement. Dan’s comments about how we use our eyes, and how this can shift our perception brings to mind my own study of martial arts and dance which has taught me that moving our bodies in unaccustomed ways, exploring the different motions and shapes we can embody, can shift our consciousness and emotional states and help to clarify our thinking. Outdoor learning provides a classroom environment that invites exploration of our physical natures as well as our intellectual natures. Most movement education lies outside of the academic arena; it is an untapped realm of potential discovery. Systems thinking through our bodies along the lines of work by

physicist and martial artist Moshe Feldenkrais (see Feldenkrais Guild of North America; www.feldenkrais.com) can help students to explore theoretical frameworks through their own bodies, experiencing how interconnected systems orient and tune to one another. Shifting movements of eyes, and bodies, can lead to new perspectives.

It was interesting to me to notice that in most of the programs I reviewed, nature study is rarely a part of required curriculum. As I analyzed students comments about how they would like to learn about ecoliteracy, I realized that they could easily be categorized under the three components of sustainability: ecology, society, economy. When speaking about ecological curriculum, students naturally raised ideas that encompassed the social and economic aspects of sustainability. This is important. Nature study, if taught well, provides a meaningful framework for studying economy, society and ecology. This makes intuitive sense if we remember that the economy is a subset of society, and society is a subset of the environment (see Figure 1).

Teach from Multiple Cultural and Disciplinary Perspectives

Include science and traditional ecological knowledge. At the university level most courses that teach students about nature and the human-nature relationship do not include hands-on study of the natural world unless it is through the lens of science, i.e. biology or geology. The downside of this approach is that many students who have an interest in understanding nature won't take these

courses because they don't like the cultural aspect of science that serves to emotionally remove the researcher from the object of research. They feel that a scientific perspective limits the ways they understand the natural world. It is important that students are given alternative ways to develop a deep understanding of nature that comes from direct observation, not textbooks. They should also develop an appreciation and understanding for what the scientific method is, and how it is used, so that they develop scientific literacy as well as ecological literacy.

Learning to recognize patterns and cycles in nature is essential to developing skills necessary to evaluate ecological health. As Orr (1992) says, ecological literacy should be made central to all education, because "people who do not know the ground on which they stand miss one of the elements of good thinking which is the capacity to distinguish between health and disease in natural systems and their relation to health and disease in human ones" (p. 86). Exposing students to traditional ecological knowledge alongside science, and exploring with them other ways of gaining knowledge directly from the natural world (i.e., extended observation, or food collection) will open students' eyes to new ways of exploring nature. It can also begin to teach them about the value systems and perspectives of those people who are more directly dependent on their environment to meet their basic needs, some of whom have critiqued western science and technology because it has negatively impacted their ability to continue their natural livelihoods. Further, by expanding the disciplines used to teach about nature and

including history, anthropology, literature, poetry, art, etc., students can learn from and discover the natural world in ways that most appeal to them.

While it might seem that a multidisciplinary approach could water down what students learn, especially if they are interested in more technical, scientific approaches, we should keep in mind that studying nature through artistic or multicultural lenses can help to refine the intuitive side of scientists which could have major benefits for scientific research as scientists like Barbara McClintock have pointed out (Keller, 1983, pp. 201-205).

As a science student, I have often scurried home from late nights in the lab to write poetry about what I observed and how it affected me, how it had relevance to my life. I knew very well that these observations of mine had no place inside of my lab reports. Nor did I feel they were topics I could raise for discussion in my classes. Nonetheless, studying other forms of life, working with them, dissecting them, learning from and with them, I was learning lessons of life and relationship, lessons I wanted to express. Had I been given the opportunity, these emotional observations would have made meaningful and fruitful discussion that I believe would have enhanced and added to the content we were exploring in my classes. In this poem I describe an experience I had in a developmental biology course. I was studying embryonic development in zebrafish embryos and spending late nights in the lab on an independent project.

Zebrafish I

It is late. I work in silence. I place a bowl full of freshly fertilized eggs on the white stage of my microscope and adjust the lens. Zebrafish eggs suspended in Ringer's solution snap into focus. The vitelline membrane rises off the denser yolk sac. I can't see, but conclude, a successful sperm has fused to the membrane, everting DNA into the egg. In a few hours I expect to observe the first signs of new life: cell cleavage followed by multiple flurried divisions into a multi-celled ball that will polarize itself into animal and vegetal hemispheres and then in a gasp, invaginate, sucking in its own cells to form a hollow tube surrounded by and swallowing the sea.

But that is expectation based on texts and films. What I know curves below my eye, round and semi-permeable, enclosed in a thick circle of glass. Expectations have nothing to do with eggs.

I observe the small spheres submerged in saline. Their smooth, curved surface catches light, throws it back against my eye. It's hard to tell where the light source is located. It could be the bright bulb of my microscope, or the overhead fluorescents, or the trace coming through the windows from the city's electricity bouncing off clouds. It's hard to tell what source of light illuminates the eggs – they glow with a quality I see and can't name.

-A. Kramer

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For years, this image has stayed with me, the luminosity of the embryos, the quality of their aliveness. When I began writing the experience down as a poem, I connected it quickly to an experience I had while viewing Michelangelo's unfinished sculptures. These statues are figures half carved from the marble blocks he worked. The effect of leaving them unfinished in this way drew attention to their emergence from the stone. It highlighted that Michelangelo's work was not only of his own creation; there was a feeling about the stone that one could see was trying

to emerge. By leaving the stones unfinished, in the middle of this process of emergence, Michelangelo allowed viewers an experience of what his work is as an artist. As I wrote my piece about watching the development of zebrafish embryos I linked it to my memory of walking past Michelangelo's unfinished statues.

Zebrafish II

I spend a week in Florence walking past David replicas. On the seventh day, I pay the entrance fee to the museum to walk down a long hallway, past Michelangelo's unfinished statues. David is at the end, where the hall widens into a round room. He holds a rock in his hand. Where the light strikes his muscled arms, the stone twists it back. Light strikes my retina, the smooth rippled stone turns to skin.

-A. Kramer



In the last section, I played with the idea of life and death having visible qualities – qualities that had something do with physical structure, and also spirit, qualities we can observe, but not necessarily quantify.

Zebrafish III

I nudge the bowl. The embryos rock back and forth in their artificial ocean. One looks different. I can't determine how. The membrane is not yet slack. But, it lacks resilience, a hint of luminescence. I sense the absence but I'm new to this study of eggs and embryos. I can't quantify how I know it is dead. Before the membrane has sunken in, before it has wrinkled and deflated, before I can determine why I know, I don't know how I know it is dead.

- A. Kramer



Anyone reading my lab notes describing the zebrafish embryos I observed would have noticed that I recorded the death of this embryo only when I could see that it was wrinkled. But it had, in fact, died more precisely near the time I first intuited its demise. In this case my intuition was more accurate than my reliance on visible cues.

If I had not attempted to describe my lab experience through poetry, I wouldn't have articulated as clearly for myself what was common to these two experiences -- both were concerned with ideas of essence, of life, of generative energy. Exploring this through a poetic lens, provides an example of the kind of back and forth dialogue between scientific observation of life, and artistic observation of life, that exists. Both illuminate the mystery of life, the mystery of what is not known.

Similarly, studying history and anthropology can give insight into how science and culture influence one another, and break down for science students the commonly held belief that science simply describes reality. By providing deep analysis into the cultural aspects of science, students can learn that how we see nature depends on what we expect to see, and further that how we understand our own human nature depends on what we believe is "natural." Exploring the natural world from multiple disciplinary perspectives can provide deeper analysis within each of the disciplines. In addition, it provides students with a greater respect for

other disciplines as well as a more realistic understanding of the insight and limitations of any knowledge base.

Familiarize students with perspectives of multiple stakeholders. Teaching from a multi-cultural perspective also means that students will be directly exposed to perspectives of multiple environmental stakeholders, particularly those whose views are marginalized by society, for example, members of communities experiencing environmental racism and classism, and members of rural communities whose needs are often overlooked or dismissed by mainstream environmentalism. Developing greater understanding about how others perceive and make sense of the natural world and understand the human-nature relationship will help students to gain skills in communicating across cultural rifts. It will also provide them with insights that can help them to see the value in folk, traditional, and community-based knowledge.

Explore Responsible Research and Technology

Ecoliteracy provides us with options. By learning the intricacies of life cycles, metamorphosis, pollination, water cycles, energy transfer, we learn the metaphors we need to know to transform ourselves, and gain insight into how we can develop technology that allows us to participate in the restoration of our inner and outer ecology. Janine Benyus (1997), who coined the term “biomimicry,” says that nature can be used as a model for our technology, as a standard against which to measure the success of our technology, and a mentor who serves to inspire us to

develop technology that supports the ecological systems to which we belong.

Responsible technology also attends to how knowledge is generated. Research methods that do not teach us to respect other organisms, or acknowledge when we take their lives or harm them, are research methods that fail to teach us how to behave in an ethically responsible manner towards the natural world. Students want to develop skills they can use in their own lives to better understand the natural world, restore damaged habitat, and meet their own requirements for food, medicine, shelter and other basic needs in a sustainable, and respectful, manner. This could be done by providing opportunities for students to work with community experts in wild foods, natural building, etc. It could also provide opportunities for students to research what types of goods might be harvested from local or regional wild places or alternatively how urban settings could be redesigned so as to include production of building materials (i.e., bamboo, trees) or food on both small and large scales.

The study and critique of various ways of developing knowledge about nature is also important when considering responsible technology. Some students have ethical concerns about what they are required to do in many science classes, i.e. manipulate and harm other organisms. Others are turned off by the emphasis that science places on quantifying and measuring nature, and relying on statistics to interpret what is observed. The merits and faults of scientific inquiry, and other kinds of inquiry, can be included in classes that teach about nature so that students

can deepen their appreciation for the variety of tools that are at their disposal, and avoid being utterly deterred or enamored of any one disciplinary or cultural approach to learning about nature.

Rediscover the Creative Arts

Art teaches us to fit patterns together, to create connections, to bring forth beauty. “What is art?” asks theoretical physicist David Bohm (1993), and explains that it is rooted in a Latin word meaning “to fit.” It is meant to create “coherence.” Bohm contests that art and science are both necessary for having a coherent value system, a coherent culture (p. 150). If sustainability education is a matter of culture and values, then ecoliteracy must blend art with science, creativity with logical inquiry. Art can also be used as a means of noticing and conveying the intricacies of the natural world that people otherwise might just pass by. Painter Georgia O’Keeffe talks about the use of art as an educational tool in her famous quote about why she decided to paint enlarged views of flowers.

A flower is relatively small. Everyone has many associations with a flower - the idea of flowers....Still - in a way - nobody sees a flower - really - it is so small - we haven't time - and to see takes time, like to have a friend takes time So I said to myself - I'll paint what I see - what the flower is to me but I'll paint it big and they will be surprised into taking time to look at it - I will make even busy New Yorkers take time to see what I see of flowers” (O’Keeffe, 1976/1985).

By inviting students to communicate how they see and experience plants, animals, rivers, and other aspects of nature, they can similarly explore the detailed

structures of natural forms, and also explore their own relationship to the object of study. The artist is concerned with conveying not only the physical structure of a plant or animal, but also the emotional feeling that it evokes in the artist. This is different than a scientific approach which teaches students that emotions are irrelevant to their research.

Art can also provide new insights into how we understand form and function. For example, Lisa Weasel's (2001) reinterpretation of the cell membrane as a membrane of connectivity, not one of separation was influenced by her work as an artist. The functional relationship of researcher-organism can also be understood differently within the context of science and art. In science this relationship is often understood as a boundary that must be maintained for the integrity of the research, whereas, in art it is seen as a point of communication and conversation that is essential to the work itself. But some scientists, such as corn geneticist Barbara McClintock (cited in Keller, 1983), have criticized this aspect of scientific culture, inviting methods of scientific research that acknowledge the relationship of the researcher and the researched. Their work suggests that focusing on the relationship we have with another organism can enhance our abilities to recognize what it is, and what it is doing. It also reminds us that we affect what we are observing, and that our actions towards it matter. These are critical values to infuse into any curriculum that attempts to teach the sanctity and value of life and ecological systems. As poet and professor Emily Grisholz (2001) writes, "Despite

their inevitable conflict, poetry and science have one important thing in common: they are both representations.” Students who study nature through both scientific and artistic lenses may become more aware of the usefulness and limitations of each.

I took a music class once, taught in a desert canyon, which taught us listen to natural sounds. Learning to differentiate and recognize sounds can also be an avenue for understanding natural patterns and relationships. The nature awareness curriculum developed by Jon Young (www.wildernessawareness.org) provides one example of how learning to recognize the patterns of birdsong can help give insight into larger natural patterns.

Using creative arts could also help students to explore concepts of the “ecosystem as self” exploring how their own bodies resemble the larger world. It can also provide students with tools to explore how they understand their natural relationships. For example, students might make a collage of all of the types of animals and plants that have personal meaning to them -- perhaps animals they encountered in the wild, or plants that they have grown in their gardens. Students might also make artistic representations of familial and cultural connections they have with the natural world, creating a map of relationship.

Finally, art directed towards expressing the spiritual dimension of the human-nature relationship has potential to help transform our culture into a culture that embraces cultural and biological diversity. According to adult learning theory,

when we are faced with change which requires us to transition from one way of thinking and being to a new way, there are three common phases that we must pass through. These are resistance to new ideas, grief for that which we must leave behind in order to change, and courage to transform (Robertson, 1988, pp. 57-59). If students are asked to question the root values of their culture in the deep ways that sustainability education requires, then they should also be provided with tools that can help to support them through this process. Artistic expression can be one such tool that can help students to explore the emotional, intellectual and spiritual dimensions of what they are learning.

Develop Cross-Cultural Communication Skills

When I asked students what ecological skills they wanted to learn, both the focus groups mentioned the ability to effectively communicate with diverse cultures as a skill they considered critical. At first, I thought they must have misunderstood my question, that is, I was asking about ecological skills, not cultural or leadership skills. But, as I listened more closely to what they saying I realized they had developed a more complex way of thinking about my question. They were imagining what skills they would need to convey ecological knowledge and to learn it from others. They recognized that to effectively work in the area of sustainability they would need to have great dexterity and skill in how they communicated about ecology with others who had different perspectives and knowledge, i.e. persons of different socioeconomic status, different political views,

different livelihoods, etc. They recognized that how we talk about nature and the human-nature relationship can alienate communities, or include them. If we are to work in the real world as environmental and social justice advocates we need to be able to speak and listen to people who are different from ourselves. And the time to learn these important communication skills is when we are learning about ecology.

In the same way that nature is model, measure and mentor, culture also provides insights into possibilities for how we might live and organize our social and economic systems so as to live in a way that supports rather than disturbs natural rhythms and cycles. Social and cultural values, beliefs and practices can illuminate possibilities we may not otherwise consider. In addition, providing students with opportunities to explore their own cultural traditions can help to develop a sense of community and a sense of purpose within students and connect them to their own rooted values from which they can draw strength and encouragement as they explore the difficult questions that we need to ask in order to create a sustainable future.

Students should also study communication so as to be aware of how language encodes cultural values. Chet Bowers (2002) points out that the language of environmental education is often based on “root metaphors” that come from a scientific viewpoint and a reductionist way of looking at the world. Students who explore how language encodes culture may be better able to address some of “the

modern assumptions” encoded in language and our educational systems that promote unsustainable thinking and practice; “these modern assumptions include viewing change as progressive in nature, intelligence and creativity as attributes of the autonomous individual, science and technology as the sources of empowerment, and the commodification of all areas of community life as the expression of human development” (Bowers, 1999). Examining the language of sustainability is important as well. Does it convey what is important? Is it muddied by current debates? When talking about the human-nature relationship is it more valuable to discuss “concepts like ‘respect,’ ‘obligations,’ ‘responsibilities’ and ‘ethics’ than it is to talk about sustainability,” as educator Bob Jickling (2002) discovered while educating Yukon College students about the political, cultural and ecological dimensions of the human-wolf relationship in the Yukon. Jickling has found it helpful to “speak about cultural, spiritual, aesthetic, and intrinsic values,” and to expose students firsthand to the views and values of diverse stakeholders by having them participate in community forums and public debate.

It can be useful to study traditional ecological knowledge and values through texts, but this is not the same as having direct contact with knowledge holders of particular traditions. The students I spoke with were interested in learning how to respectfully dialogue with traditional peoples. They also wanted to be able to learn from them through observation. They felt that learning skills and knowledge such as plant identification and use would be most effectively

transmitted through direct interaction. Students also raised concerns about cultural appropriation, the misappropriation and use of knowledge and skills that are not of their own cultural lineage. In teaching about traditional ecological knowledge it is important to recognize that these are traditional in the sense that they are knowledge systems that have accumulated hundreds or thousands of years of lived experience within a particular bioregion, but they are contemporary in that they are constantly changing and adapting knowledge systems that are relevant today. Learning to respect the fluidity of traditional culture and also its relevance to contemporary life is important for both students and indigenous people.

Folk wisdom is often rare and unique, vitally necessary as we work at building a new world. And folk ways are of even greater value when they are learned from a living culture. Besides the value to us of what we learn, there is a value to them in feeling that their way of life has something to contribute to humanity as a whole. When we learn from what others have to teach we grow in respect for them, increasing the feeling of the interdependence of all.
(Coperthwaite, 2003, p. 14)

I want to emphasize that students who study other cultures should also engage in serious study of their own cultural traditions. This is particularly true for white Americans who often don't feel like they have a culture. Studies on how adult learners perceive ethnicity indicate that "it is reasonable to assume that whites who deny their own ethnicity will reject ethnic groups who want to stress and celebrate their own cultural uniqueness" (Jones, 1990). The opposite phenomenon is also true, where White students may become so enamored of other cultural traditions, that

they dismiss the lessons they might learn from exploring their own roots, and may tend towards cultural appropriation of other traditions. Research also suggests that White students who understand and appreciate their own cultural heritage can more comfortably examine concepts of “White privilege” and “White racism” and understand how they are personally connected to institutionalized forms of racism (Ortiz and Rhoades, 2000). One of the errors of the U.S. environmental movement is that it has framed its history as a White American history, represented by people like Henry David Thoreau, John Muir and Rachel Carson. It has pointed out that if the environmental movement wants to be effective, it needs to be a movement that moves beyond its White, middle-class base and includes the interests and voices of working class communities, and people of color. In response to a recent report, *The Death of Environmentalism*, (Shellenberger and Nordhaus, 2005), Brown (2005) called attention to this, advising the environmental movement to concern itself with the issues of social justice that press against the working class and people of color as a matter of survival as real as environmental threats. If the sustainability movement is to be successful at addressing the social, economic and environmental problems it aims to heal, it will be a movement of movements that emerges from the common struggles for indigenous rights, labor rights, civil rights, gay and lesbian rights, and the common histories of the peace movement, environmental movement, and feminist movement to name just a few. An effective sustainability movement will embrace religious, political, class and geographical diversity and

recognize that any successful effort to achieve social justice, economic equity and ecological health must be based in compassion and the reality of people's lived experience. If the sustainability movement in the United States is not to be exclusionary, it will need to recognize its connections to all of the diverse grassroots movements that work to address social and economic inequities and restore environmental health, and it will need to actively address social inequity at all levels. Any professional conference, association or educational forum on sustainability should feel a moral obligation to represent the dreams and work of people from all backgrounds, so that we not repeat the mistakes of the past. Focused effort should be made to acknowledge and reward the academic, professional and community work of underrepresented and underpaid members of the sustainability movement, particularly people color, women and elders whose work to build community connections, preserve cultural heritage and support the natural environment is often invisible, unpaid, and marginalized.

Another important way in which biocultural literacy can contribute to sustainability is by providing models for different ways of teaching and learning (Barnhardt & Kawagley, 2005; DeLoria, 1991). For example, we can learn how to utilize less resources in educating by adopting learning techniques used in cultures with primarily oral traditions. I am sure most scholars of classical western education are familiar with the *Odyssey* and the *Illiad*, great epics of unquestionable beauty and meaning. I am sure that most are also aware that these

epics are oral masterpieces, passed down from generation to generation, taught, learned, and remembered all without the pen, paper or computer. The facility of a mind that could retell such a tale is awe-inspiring. But, such feats are still accomplished today. One might argue that this type of memorization and rote learning is unnecessary. I believe it is not only necessary, but that it would help to refine the quality of learning that takes place in the university. Without the use of pen and paper, a person must internalize knowledge and integrate it into themselves, or they will simply lose it. Developing these abilities would enhance students' abilities to learn and increase their capacity for not only understanding but also integrating knowledge. It could also help students learn to respect and appreciate oral knowledge traditions and learn how to transmit knowledge in ways that rely on human memory and community memory. Writing and computers are useful tools, but we and our educational system have become overly dependent on them.

Exploring ways to increase oral literacy would also help to free professors and students from the confines of the classroom, as conversations and recitation can happen anywhere without requiring writing implements, paper, desks, etc. In addition oral literacy would provide a means by which the humanities could easily enter into a sustainability curriculum, as it could draw from theater traditions as well as speech and debate, and oral literature. Poetry, in its oral form, has made its way back into popular culture through rap and hip hop music and slam poetry. And of course there is lyrical music. Exploring the richness of human vocal expression

can bring the practical concepts of linguistics into the curriculum as well. In addition, it would develop the capacity for listening, a critical skill for community dialogue and discussion, necessary tools for negotiating and developing relationships. Furthermore, I think oral traditions call for a nakedness which written literacy avoids. When a person speaks they speak with their whole self: physical, emotional and vocal. They express through body language, gestures and feeling. Learning which calls upon us to practice these abilities is vital for sustainability education if it is to teach us to acknowledge, repair and restore relationships with people whom we have been taught in our current social paradigm to ignore or dismiss. It will invariably help to bridge the gap between the intellectual academic world and the other multitude of communities to which we belong, or could belong, some of which do not use the written word to express themselves. While current academic writing calls for students to develop their thinking and ability to construct logical, meaningful documents, it does not generally allow for or develop creativity of expression. This is a missed opportunity. If a cultural shift is needed for sustainability to take root, then artistic, cultural expression will play a vital role in creating this shift. Students who are well-versed in diverse forms of expression will be better able to use cultural tools to shift consciousness.

Explore Human-Nature Reciprocity

A major concept that came up several times in my conversations with students was reciprocity. This was interesting to me because I felt it could provide a

useful way of bringing questions of economy -- the exchange of goods and services -- into classes on ecology. If we talk about the human-nature relationship in economic terms then we can begin to see how we can use our economy to benefit ourselves as well as our ecosystems. In this regard, understanding ourselves in economic relationship to nature is simply recognizing that we have ecological services and goods to give to our non-human neighbors in exchange for what they provide for us. For example, as animals, we humans consume food and excrete waste that can in turn become food for plants, bacteria and fungi. We breathe in oxygen and breathe out carbon dioxide that plants utilize; they release it back into the atmosphere as the oxygen we require. These are some of the more basic biological ways that we are connected to the natural world. Although we often think of our own "waste" (both excrement and garbage) as something to be removed, sterilized and kept apart from the natural world, we can also look at ways to use it for the benefit of our own and other species. The structures that we build, and the landscapes that we alter can also provide for the needs of other species if we design them well. Becoming more conscious of the possibilities for how we might contribute to our biological communities can help us to explore how we meet our own needs without compromising ecosystem health, which ultimately is our own health.

In addition, two of the distinguishing characteristics of humans are our vocal capacity for language and our ability to create things with our hands. Martin

Prechtel (2005) teaches that our language and our technology are our human gifts - both of these can be used to harm others, and both can be used to help restore what we damage by being alive. First Nation member Joe Sheridan (2001) calls for us to consider that habitat restoration work includes cultural restoration work. He speaks of the mythical stories that are struggling to survive, and have “gone underground” because of ecological damage to the landscape. He talks about ecology and story as “twins,” two manifestations of a common spirit. And he advises that “to have healthy forests and healthy myths requires understanding that story can only be guided by ecology, and ecology can only be guided by what is intact.” Understanding that the material relationship we have with the natural world is a spiritual relationship, we might ask how we can use our gifts of language and our abilities to build with our hands to provide useful, meaningful gifts to that which sustains us. We might also acknowledge, as Jordan (2003) suggests, that even if we live in the most sustainable way possible, we are indebted to the web of life in a way that we cannot repay, and that it is for this reason that it is important to make symbolic gestures that recognize we live, and we have lived, at the expense of other lives, and in this way mitigate spiritually, since we cannot materially, for the damage we have done.

Education about the natural world and our relation to it also offers an opportunity to delve into issues of economy. Through studying cycles of energy exchange that occur in the natural world, we can imagine different ways of creating

and understanding economy. Economic models can be further informed by studying diverse cultural ways of organizing human labor, and exchange of goods and services. The exchange of goods and services is another way to define ecological relationships, so if we study economics we can also ask questions about reciprocity, generosity, shared resources, natural equity, and cooperation, and what Hawken (1997) has termed natural capitalism. Rather than a burden, our economy can be a gift to the other forms of life which help to sustain us. By studying economic issues through an ecological lens, students can ask questions about how they support themselves in the world, and learn to identify and cultivate the gifts they have to offer. By extension, they will learn to cultivate these gifts in their peers and understand how they can organize to contribute to natural, social and economic capital. They can learn to value the economic systems that support them which are not monetary, and to recognize those people who contribute to them and are often unrecognized for their work. Permaculture offers an interesting way of calculating human services and needs. Students studying ecology and the human-nature relationship could use the permaculture strategy of assessing the functions of design elements to determine how humans can best fit into natural ecosystems so as to benefit other species and create usable habitat.

In *The Sunflower Forest*, a brilliant examination of restoration ecology work, Jordan (2003) discusses how restoration work provides a tangible means by which humans can understand their economic relationships to the natural world.

Jordan discusses the impact and importance of ritualized exchange as a means of mitigating the damage that humans ultimately must do to other life forms in order to survive, and discusses how understanding that we cannot ultimately reciprocate enough to pay back the debt we owe to past generations and to life itself provides humanity with a healthy dose of humility.

Everything we have we take from nature, sometimes by persuasion or collaboration, sometimes by outright theft. Either way, the debt we incur is, or at least ought to be, a constant concern. (2003, p. 96)

Further Recommendations for Educating for a Culture of Sustainability

Having already made a number of recommendations by way of summing up the key findings of my research, I would like to end by mentioning a few additional ways that educators and educational leaders can foster a culture of sustainability in their classrooms, institutions and the wider world.

Support Cultural and Linguistic Diversity

Cultural knowledge is encoded in language, and formal education is one of the leading factors in destroying linguistic and cultural knowledge. The Americas and Australia lead the world in loss of linguistic diversity; in the United States and Canada 417 languages are on the verge of extinction (Oveido, Maffi & Larsen, 2000). Acknowledging that cultural diversity and biological diversity are linked, institutions of higher learning should use their institutional power to help preserve

linguistic and cultural diversity by providing opportunities for keepers of traditional knowledge to teach about their culture and language as they see appropriate.

Create Diverse Learning Communities

Actively recruit students from diverse socio-economic, geographic, ethnic/cultural, rural/urban backgrounds so as to provide students with opportunities to learn from others who are not like themselves. The U.S. Department of Education provides many examples for diversifying the student body of a program or institution in its report *Achieving Diversity: Race-Neutral Alternatives in American Education* (U.S. Department of Education, 2004).

Support Colleagues in Addressing Sustainability

Remember we all need encouragement. Approach sustainability as a conceptual whole, commit to it as a whole, but recognize the need for specializations as well to move things forward. Create learning communities among faculty and staff to discuss ways to implement sustainability pedagogy and bring sustainability values into curriculum and teaching practice. Hire faculty and staff who work across departmental boundaries to address sustainability. Create resiliency in the university enough to withstand funding shortages. Become creative in how sustainability is brought into the curriculum.

Connect to the Wider Sustainability Movement

Participate in academic conferences and community dialogues on the direction of sustainability and host your own. Make use of the Internet as a tool for connectivity. Utilize graduate program guides and listings to spread the word about what you are doing to others. Sign the *Talloires Declaration* and other international declarations and endorse the *Earth Charter*. Post curriculum on sites such as Association for the Advancement of Sustainability in Higher Education (www.aashe.org) that can be accessed by other educators. Focus visioning work on bringing sustainability into all disciplines, and into pedagogy. Work with departments to come up with strategy for addressing sustainability within departmental curriculum, pedagogy, research and operations. Set concrete goals for how to shift towards a sustainability culture.

Create a Permeable Boundary Between the University and Community

In addition to furthering knowledge, universities confer social and economic status to individuals through the granting of degrees. This places the university system in a unique position to recognize realms of knowledge that have previously been ignored or marginalized within the university. Recognize community experts in areas of sustainable living and practice and bring them into your classroom, or bring your students to where they live or work. Williams and Taylor (1999) coined the term “permeable boundary” to refer to this more fluid relationship between community and school environment. Develop community

based learning programs that focus on supporting local community sustainability efforts. Focus university research on supporting biocultural community needs.

Be Multidisciplinary in Approach

Explore the human-nature relationship from disciplines such as natural sciences, literature, philosophy, anthropology, political science, history. In strengthening the breadth of approach, be cautious in not reducing depth of learning. Emphasize humanities/creative arts. Bring in diverse cultural perspectives (i.e., from divergent socioeconomic, ethnic, religious, vocational backgrounds). Help students to develop their communication skills and ability to understand diverse perspectives.

Use Ecology as Basis of Curriculum

Spend time outdoors and use nature as text. Press against your own boundaries of discomfort and allow yourself to explore new ways of teaching. Learn from the work of others. Remember you don't have to be a biologist or a naturalist to meaningfully educate about the natural world using a hands-on approach. Develop your own relationship to nature; create a culture that is attentive to the dynamic workings of the natural world. By dissolving the dichotomy between human and nature, cultural values that support both will begin to emerge.

Recommendations for the LECL Program

It takes years and years to know things, to learn things in a tribe. Education is a graceful, gradual thing among the adherents to traditional Mayan ways. Learning too fast or conceiving large knowledge too quickly at too early an age is considered dangerous to the soul and nonproductive to the community. (Prechtel, 1998, p. 122)

With consideration for the unique history and perspective of the LECL program and community, and with respect for the careful, heartfelt work that has gone into its development I would like to offer the following observations and suggestions for continuing to improve the LECL program. As throughout my recommendations, I will reference the current course offerings of the program, I have outlined them in Table 7 for ease of reference. My recommendations include suggestions for faculty size, student to faculty ratio, student diversity, community-based learning, program flexibility, faculty diversity, curriculum, program leadership, and celebrations. While these recommendations will likely be of most interest to the LECL community, as it continues to evolve, they may also be of interest to students, faculty and administrators of similar programs.

Table 7. *Current Required Courses in LECL Program*

EPFA Core (16 credits)

Developmental Perspectives on Adult Learning (4 credits)

Social Foundations of Education (4 credit) or Philosophy of Education (4 credits)

Educational Organization and Administration (4 credits)

Principles of Educational Research and Data Analysis (4 credits)

LECL Core (16 credits)

Leadership for Sustainability (4 credits)

Global Political Ecology (4 credits)

Collaborative Ethnographic Research Methods (4 credits)

Ecological and Cultural Foundations of Learning (4 credits)

Faculty Size

Observations. I believe the most critical limitation in the LECL program is that there is only one committed faculty member who is available to teach the four LECL core courses. Since this faculty member is also the executive director of the program this creates a lack of organizational resiliency; the bulk of the program is carried forward by one person. In the current situation, Pramod Parajuli is required to develop content and curriculum for all four LECL core courses; facilitate meaningful classes by providing students with adequate academic and personal support; serve as a graduate advisor to 70 students; supervise several graduate assistants; advise theses and project students; interview prospective students; develop relationships with community partners; engage in strategic visioning; attend meetings with the newly developed LECL Leadership Council; organize community events; and guide the direction of the LECL program. This places the program at risk as it is entirely dependent on Pramod's ability to support it. It also

limits students' ability to engage academically with faculty with divergent perspectives and areas of expertise in sustainability.

Suggestions. Secure funds to bring in sustainability oriented faculty with strong backgrounds' in biology/ecology, economics, and humanities (i.e. literature or other arts). In addition, bring in more visiting faculty from a variety of backgrounds to diversify and enliven the learning community. Bring back the tradition of Friday brown bag lunch discussions on sustainability with EPFA faculty. This may be a way to help to infuse the EPFA core courses with ecological and cultural perspectives, providing students with a richer learning experience. Also, utilize the newly formed LECL Leadership Council to provide needed support to LECL faculty.

Student to Faculty Ratio

Observations. Currently there are over 25 students in their thesis or project work and only two primary advisors to support them. This ratio is considerably higher than that of most other comparable programs according to information I collected. Thesis/project students are limited in one-to-one access to faculty advisors. Further, many of the concentration areas that LECL offers lie outside of the areas of expertise of current faculty.

Suggestions. Secure additional faculty for the program. Alternatively, reduce the number of students admitted to the program. Restructure the advising process to provide more structure for students. For example, offer a guidebook for

the project/thesis process written by former students. In addition, limit the number of concentration areas offered to those few that have strong faculty and university support.

Student Diversity

Observations. The original vision of the LECL program was to bring together students of diverse backgrounds. While the size of the student body has grown, the vision for a diverse and varied student body has yet to be fully realized. It is diverse in professional and academic backgrounds, as well as age and life experience. However, with specific regard to gender and ethnic diversity, the program should strive for a more balanced representation. Continue to broaden the geographic base of the program, and recruit international students to increase the effectiveness of the learning community. Current recruitment materials include the program website, program brochures, and word of mouth. LECL has tabled at several local events in the Portland area, primarily environmental conferences and fairs. Since the U.S. sustainability movement is strongly rooted in the environmental movement, and is dominated by white professionals and activists, recruitment efforts aimed at these audiences are going to predominantly attract white, progressively-minded young people to the LECL program, and serve to perpetuate a student culture that is fairly homogenous. As Schein (1985) observes, “... culture perpetuates itself through the recruitment of people who fit into it”

For LECL to become a truly diverse community, it must examine its recruitment and retention processes.

Suggestions. LECL faculty and students should work together to develop a recruitment strategy that attracts students from diverse socio-economic, ethnic, geographical, etc. backgrounds. In addition, gender balance should be a goal for the program. Institutional support for increasing diversity is ample at Portland State University. PSU President Daniel Bernstine has taken an active role as a spokesperson for increasing diversity in the student body, faculty and administration of PSU. He established the PSU Diversity Action Council to examine how PSU could effectively increase campus diversity. In recent years the Council released a Diversity Action Plan that set institutional goals around increasing diversity represented in students, staff, administration and curriculum (PSU Diversity Council, 2003). The Plan, backed by \$45,000 per year, allocates funds for recruiting efforts and scholarships to attract students from underrepresented cultural groups. The Plan calls specifically for increasing ethnic and cultural diversity in PSU's graduate programs. As a graduate program that focuses on social justice and diversity issues, LECL could make use of these resources to increase student, and possibly faculty, diversity. Additionally, faculty could engage students more often in partner and small group exercises that facilitate discussions of class, gender, race, sexual orientation, religious and other identities so that students can hear and learn from one another's life experiences.

Community-based Learning

Observations. This area of the program as suggested by Dilafruz Williams needs some attention to maximize its potential.

Suggestions. I will address this in my suggestions for curricula changes.

Program Flexibility

Observations. The LECL program has created flexibility by offering electives that make use of PSU's wide course offerings and faculty expertise. In addition, it has developed student-led courses to harness the skills and knowledge within LECL's student body.

Suggestions. If any changes are made, I would increase students ability to self-design their programs. This flexibility allows students, with careful advising, to deepen in particular concentration areas that best meet their interests and needs.

Credit Hours

Observations. Current credit hours provide adequate opportunities for depth and breadth, but also afford students with time and financial constraints to finish the program. Students who wish to take additional credits are still able to do so. Comparable programs average 40 credits, and of the seven programs I reviewed only Antioch required more credits than LECL; the other programs all had fewer credits than LECL.

Suggestions. I recommend keeping the same credit hours.

Faculty Diversity

Observations. The “perennial optimism” of Pramod and Dilafruz is a constant inspiration. They each exemplify the effective strength that comes from combining the power of intellect and heart, and are unwaveringly committed to making the world a better place. As Dilafruz stated, they bring to the program the perspective of the urban and rural Global South that is invaluable. They also balance each other well with regard to their professional areas of expertise and experience. Their involvement with students in the program however is not equal, so the overall effect is imbalance.

Suggestions. Involving visiting lecturers and community partners is an effective strategy, and there is a good deal of diversity represented in those who have been a part of the program thus far, this should continue with mindfulness as to who is *not* being represented, and on-going efforts made to continually increase the diversity of the program. Of particular need right now, in my opinion is to include people who come from rural, conservative and corporate points of view, as well the working poor and Portland’s communities of color.

Curriculum

Observations. The content of the core LECL courses is rich and varied, but there is always room for improvement. My sense is that it is better to work with the existing structure of the four EPFA courses, four LECL courses and respective community-based learning hours (CBLs) and not tamper with the EPFA courses,

with the exception perhaps of the research course. I enjoyed and was informed by all of the EPFA core courses, but found that the Research class did not have enough depth to be of real use, since the course covers both qualitative and quantitative analysis, and Collaborative Ethnographic Research Methods (CERM) covers qualitative research in much more detail.

Suggestions. I agree with Dilafruz that the most effective way to adjust the LECL curriculum is to work with the existing structure of four LECL core courses and their respective CBL's. But, I think some adjustments would make the program more integrated and cohesive. If possible, my suggestion would be to substitute the EPFA research course with a 3 credit elective in a more sophisticated Qualitative or Quantitative Research course that would serve the purpose of helping students with their project/thesis work. I suggest continuing to use the Partnership Model of Sustainability as a framework for the LECL curriculum, and including it as part of the syllabi for all LECL courses so that students understand the framework for the program. In addition, I would suggest teaching Leadership for Sustainability (LFS) as a weekend intensive course during the beginning of the fall term that would be used as an orientation to the LECL program for new students to provide an overview of all of the four partnerships of sustainability. In addition this course would help students to define terms like ecology, culture, sustainability, leadership and education within a sustainability framework and compare it to the multiple definitions used in various academic disciplines as well as in common usage. The

remaining content from LFS could be woven into Global Political Ecology (GPE) or the other courses. I would restructure Ecological and Cultural Foundations of Learning and combine part of the content with Dilafruz's Sustainability Education class which would then become a core course and would allow Dilafruz contact with all LECL students. I think Sustainability Education should include nonformal and formal education and include a history of sustainability education and analysis of UNESCO's work and the Earth Charter Initiative which provide leadership and visionary tools for educators. The remaining class of the four core LECL courses could be called Ecoliteracy for Sustainability and be taught ideally by an additional faculty member with experience in biology, ecology and natural history as well as a deep understanding of the issues of sustainability education, and a cultural perspective. This course would be focused primarily on understanding ecological concepts through the lens of science and culture but would have more in-depth ecological knowledge and would include study of local and regional ecosystems from ecological and cultural perspectives, similar to the Local Political Ecology course that one of the focus groups suggested. It would address all of the ecological outcomes Pramod developed (see Table 1). This suggested rearrangement is summarized in Table 8.

Table 8. Recommended Changes to Required LECL Courses *

EPFA Core (15 credits)
Developmental Perspectives on Adult Learning (4 credit)
Social Foundations of Education (4 credit) or Philosophy of Education (4 credit)
Educational Organization and Administration (4 credit)
<i>Qualitative or Quantitative Research course (3 credit)</i>
LECL Core (17 credits)
<i>Leadership for Sustainability (1 credit) -overview of all partnerships</i>
Global Political Ecology (4 credit) - inter-economic partnership
Collaborative Ethnographic Research Methods (4 credit) - inter-cultural partnership
<i>Sustainability Education (4 credit) - inter-, intra- generational partnership</i>
<i>Ecoliteracy for Sustainability (4 credit) - interspecies partnership</i>

**Proposed changes are in italics.*

The 30 hour CBL component of each core LECL course could then be utilized as it is now to provide hands-on experience to students. I believe the CBL's would be most effective for students, faculty and community partners if they were approached as long term research projects. The long-term projects could be carefully selected and designed so as to provide students direct experiences working with diverse biological and human communities with the specific intent of providing opportunities for students to deepen their ecoliteracy, biocultural literacy, research, teaching and leadership skills. There is a model of community research for undergraduates of science that I think has relevance to the LECL program: the U.S. Long-Term Ecological Research Network (2004) involves science students and faculty in long-term research projects located on wildlife refuges. These research efforts are funded by the National Science Foundation, have a long-term

focus, provide measurable and significant research outcomes and provide great experiences for students and faculty alike. LECL could similarly look at developing four long term research projects in each of the focal areas that could be developed as a funded long term project with community partners. This could be a way to begin building the LECL program as a national center for sustainability education research and curriculum development. This approach may also be a way to secure long-term funding for additional faculty.

In addition to developing students' cross-cultural and inter-species relationships, the CBLs would be designed to provide specific skills to students within their relevant content area. There are many that could be included, but a few that seem relevant are:

1. Inter-species: Identification of local flora and fauna; identification of medicinal and edible wild foods and knowledge of preparation; permaculture; identification of natural seasonal and weather patterns as knowledge of how these affect local ecosystems; nature observation; ability to effectively teach others for nature appreciation and knowledge through the use of cultural and scientific tools.

2. Inter-cultural: Building community knowledge; facilitation; dialogue; networking; observing; interviewing

3. Inter-economic: Grant-writing; business plans; non-profit management skills; human resources skills; labor laws and policy; non-monetary goods and services

4. Inter- and Intra-generational: teaching at all levels: professional trainings; public school systems; campaign organizing; curriculum development; press releases, journalism; graphic design; performance art and ritual

Program Leadership

Observations. It seems to be that the newly formed Leadership Council can play a useful role in helping faculty to articulate the vision and strategic plan for LECL by providing a student/alumni/community perspective. I think strategic planning would be most effective if communication about program direction was clearly articulated and agendas were set in accordance to goals.


Suggestions. I would recommend for summer 2005 that the LECL program undergo an intensive visioning session, facilitated by a trained professional that would involve all members of the LECL community interested in participating so that a 10 year plan for LECL's development can be articulated clearly with community vision and insight, and an agenda can be set with an attached timeline and desired outcomes so that it is clear how each member of the LECL community can participate in effective leadership and efforts to the most effect. As part of this

effort, I recommend that Pramod share with the LECL Leadership Council his work on Desired Outcomes for students, part of which appears in Table 1 of this thesis.

Celebrations and Rituals for Remembering Who We Are

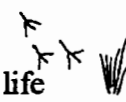

Observations. The LECL community has great vision, energy, optimism and thoughtfulness. It would be great to harness this in a celebratory manner that is planned in advance and that involves the whole student community in the planning process, and helps to solidify our communal commitment to all of the partnerships of sustainability.

Suggestions. A powerful symbol for the LECL program is the Partnership Model of Sustainability developed by Pramod. It would be meaningful to structure community gatherings and rituals around each of our core partnerships. Since there are four partnerships, each one could represent a season. At the fall retreat students could sign up to help coordinate one of the four seasonal community events. By having a quarterly celebration that was pre-scheduled this would help share the burden of organizing and also provide students with an opportunity to work on a meaningful leadership project together. I sketched out a sample idea for what this might look like and some places where it might happen. Of course, the LECL program will evolve as it needs to evolve from the collective vision of the program. Consider these suggestions just a snowflake to add to the collection, as well as a mark of gratitude.



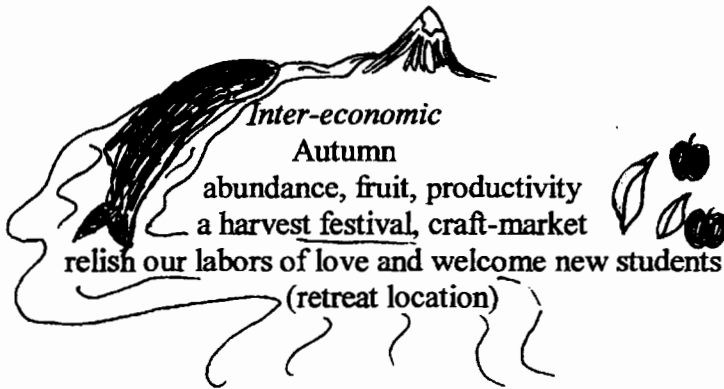
Inter-species
 Spring
 hope, renewal, life

quiet reflection to enjoy our connections to nature
 (Columbia River Gorge; Sandy River; Sauvie Island; Oregon Coast)





Inter-cultural
 Summer
 exuberance, joy, expression
 a community celebration

dance, art, music, story from all of our collective cultural traditions
 (Portland Park Blocks or Waterfront)



Inter-economic
 Autumn
 abundance, fruit, productivity
 a harvest festival, craft-market
 relish our labors of love and welcome new students
 (retreat location)



Intra- and inter- generational
 Winter
 elders, children, storytelling
 a gathering together of stars, snow, stories
 remembering with the older and younger people in our lives
 (faculty and student homes; cabin on Mt. Hood; Marmot cabin)

There is a word for it
 open mouth
 eyes wide wonder
 of this blue, green egg

somewhere, something hatches
 perhaps it is the ginkgo stem
 fanned out like a leaf
 an old umbrella to the rain

perhaps it is the oak
 bronze autumn scurry
 of squirrel tails
 bustling about
 with business purpose

it could be the ants
 advancing into the pantry of sugar
 exposing unclean surfaces

or the wind
 dusting snow over pawprints

whoever says it first
 builds the nest

whoever says it next
 brings birds back
 to the roost.

-A. Kramer

Weaving It Together

There are always stories within stories, and they expand outwards. Sustainability education is nothing short of good education as one astute observer noted. It is what human beings have always taught. “The proof is in the pudding,” as someone’s grandma said. That is to say, if people hadn’t ever taught sustainability education before this generation then we wouldn’t be here to talk about it in the first place. The lessons of sustainability are lessons of relationship: relationships among peoples, relationships among species; relationships among ecosystems; relationships among the seen and the unseen. They are lessons of survival. Leslie Marmon Silko (as cited in Wright, 1986) says the Laguna people tell stories to one another in times of hardship, stories of how hard it was for someone else, stories of how they got through it. The stories include trees, rocks, rivers and seasons that situate the story in their familiar home. Over time, embedded in the place they live, their landscaped stories and their storied landscapes are understood as inseparable. These twins embody the sustenance of their survival.

Like the threads of spiders, caterpillar threads are quiet matters. They are almost invisible to the human eye. It is only when wrapped into a thick mummified case that they are seen, and by then the task is done, the caterpillar’s soft body carefully tucked away. What I mean to say is that sustainability education happens all the time in ways we are not accustomed to seeing. Spider webs have little to do

with academic institutions. Neither do cocoons. And thread? Handiwork is the antithesis of the scholarly life. If words are the text of scholarship, then threads are the text of sustainability. Hiding behind the words we write have always been the fibers we take for granted. Hidden handiwork of generations, destroyed, dismissed, ignored, burned, killed, forgotten. It is not necessary to invent education for sustainability, only to let sustainability education reinvent us. What is needed is to notice what we are not paying attention to, who we are not listening to, and to open the doors of the university wide - to welcome in the teachers left out for far too long, to let out the students who yearn to understand the living movements of the world beyond the confines of walls.

I tell a story about a white snake. It comes to me from the Brothers Grimm, from the region where my grandparents were born.

A servant lifts the cover from the platter he carries to the king each day, and discovers a white snake. Secretly he tastes its flesh. Now, he is able to understand the language of birds. Now, he understands animals. He finds a ring, leaves the castle, wanders in search of something. He stumbles across fish, ants, birds in trouble. They are not what he is looking for, but he helps them. They tell him, in turn, they will return his good deeds. They tell him when he is in need they will come to him. A princess appears, magically, and the man falls in love with her. She does not love him. She sets him to tasks he cannot accomplish. Sort the grains of the field. Fetch the ring from the bottom of the sea. Bring me the apple from the

tree of life. He is humiliated as all good men must be. He is unable to do any of it himself. She has nothing to do with him. Ants come into the field, working through the night. Grain is sorted into neat piles. Fish appear from nowhere holding a golden ring. Birds fly in and drop red fruit in the court of the princess. By his friendship with animals he is saved. By his generosity he is granted wishes. For his dedication she loves him. Happily ever after, they live.

I am back in class, instructing my peers to make two circles, facing each other. "Remember the stones, the grass, the birds and animals, the dirt and insects you interacted with today," I instruct. "What did you taste of the natural world today?" I ask, and the inner circle responds to the outer. The inside ring rotates to the right. "What did you hear?" I ask another question and the outer circle responds to their new partner. "What did you touch?" "What did you smell?" "What did you see?"

The air fills with sounds, smells, sights, tastes, sensations of the world we live in. the students sit down and find a partner. They begin to share stories of themselves, old stories of the places where they come from. We talk about the lessons buried in the folktale. First, the man learns to listen to the cries of others. He hears fish calling from the reeds where they are struggling to get back to their lake. He hears them, and he frees them. Then, in his carelessness, the man leads his horse over a colony of ants. The ants are crushed, in disarray; they are angry and tell him so. He recognizes he has harmed them, and he rectifies the harm. He turns

his horse aside. Finally, he meets birds, pushed from their nest, deserted by their parents. They are hungry. He has no food to give them, so he sacrifices the horse he rides, putting their needs before his own (and those of his horse!). If we understand the horse as a symbol it symbolizes the man's independence, his mastery over animals, what sets him apart from the earth. He gives this up for hungry nestlings. Through these actions of reciprocity: caring, changing behavior, sacrificing and nurturing he becomes a member of a larger community of life. He in turn, is supported when he is in need. We talk about the story and we build nests. We make eggs out of sunflower seeds and small pieces of colored fabric tied up with string. Later, we take them to the places we live, we unwrap them to feed birds. Storied reminders to pay attention to whom we meet and how we meet them. Small gestures of reciprocity.

Ground, platform, burrow
Cavity, pendulous, cup.
It's now your turn to build one
Or else make a new one up!

Of all the nests that birds can build
 There's six that we can name.
 So join us for a bit of fun
 As we play a naming game.

Listen close to each description
 And when we're done, repeat
 This chorus line that lists them all
 In a little rhyming beat.

CHORUS:
 Ground, platform, burrow,
 Cavity, cup and pendulous
 Practical yet tasteful
 Bird nests are tremendous!

Killdeer, geese and murres
 Simply nest upon the ground
 In a slight depression of soil or sand
 Made by pushing dirt around.

CHORUS

Eagle, heron and great horned owl
 All had a revelation.
 Their platform nests are made of
 sticks
 Piled high for elevation.

CHORUS

The kingfishers and burrowing owl
 Dig deep into the earth
 To make burrows for their nestlings
 With fervor and with mirth.

CHORUS

Pileated woodpecker, and the little elf
 owl
 Use cavities in tree trunks and cactus
 They make them themselves, or find
 someone else's
 Cause they don't always build better
 with practice.

CHORUS

Robins, thrush, swallows and dipper
 Make mud, twig, grass, and moss
 cups
 On houses, in grasses, or even mid-
 stream
 But mostly in branches, high ups.

CHORUS

Northern oriole young are suspended
 On a limb, in a deep, woven pouch
 Safely away from predators,
 And secure from a fall into "ouch!"

CHORUS

Ground, platform, burrow
 Cavity, pendulous, cup.
 It's now you're turn to build one
 Or else make a new one up!

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APPENDIX A

ADDITIONAL MASTER'S PROGRAMS WITH A SUSTAINABILITY ORIENTATION

Antioch University New England, Keene, NH. Antioch New England has several masters' programs in education that address environmental issues. Their programs emphasize place-based education, <http://www.antiochne.edu/>.

California Institute of Integral Studies, San Francisco, CA. The Institute offers an MA in Transformational Learning and Change that can include a focus on the environment; an MA in Cultural Anthropology and Social Transformation with an emphasis in Gender, Ecology, Society is also offered, <http://www.ciis.edu>.

Ecoversity, Roving Scholars Program, Santa Fe, NM. Ecoversity offers certificate and undergraduate degrees, and may offer a master's degree in the future, <http://www.ecoversity.org/>.

Naropa University, Boulder, CO. Naropa offers an MA in Environmental Leadership. The program emphasizes systems thinking, wilderness exploration, and indigenous knowledge, <http://www.naropa.edu/envma/index.html>.

University of the Wild, Petersham, MA. University of the Wild is a program of Earthlands that is currently forming partnerships with the University Without Walls at the University of Massachusetts, Earth Education at Greenfield Community College, Massachusetts and other experientially-based institutions of higher learning worldwide. The program offers an individualized progression of study to help students deepen as “ecological citizens” through natural inquiry and exploration of self in a global context, <http://www.universityofthewild.org>.

University of Washington, Bainbridge Island, WA. Islandwood is a residential program offering an MA/MS in Education, Environment and Community. Students and faculty live, work and study together for the duration of the program, <http://www.islandwood.org>.

APPENDIX B

SUSTAINABILITY EDUCATION CENTERS AND INITIATIVES

In my research, I came across some non-degree initiatives that address the cultural facets of sustainability education in unique ways. These programs influence various levels of university education programs. I've listed a few of these below with a short synopsis and website link.

Arizona State University, Phoenix, AZ – International Institute for Sustainability is a newly funded institute intended to address regional and international sustainability issues. The institute will involve interdisciplinary collaboration across ASU's colleges and schools and will partner with institutions such as Stanford, Harvard, MIT, university of Washington, Instituto Tecnológico de Monterrey in Mexico; Cambridge University in the United Kingdom; the University of Cape Town in South Africa; and the Indian Institute of Technology in Delhi. <http://sustainability.asu.edu/iishome/index.jsp>

Florida Gulf Coast University, Ft. Myers, FL - Center for Environmental and Sustainability Education provides opportunities for faculty, staff and students to engage in scholarly activity related to environmental and sustainability education, advances the research methodologies and pedagogies used in sustainability

education, educates for an ecoliterate citizenry and provides professional development to educators. Dr. Peter Blaze Corcoran is the director of the center; he has been active in international sustainability education initiatives and currently serves as a Senior Fellow in Education for Sustainability University Leaders for a Sustainable Future and a Senior Advisor for the Earth Charter Initiative in San Jose, Costa Rica. www.fgcu.edu/cese

Franklin Pierce College, Rindge, NH - Monadnock Institute of Nature, Place and Culture is a research and education institute that examines “sense of place as a context for living;” the institute works with local high school students and undergraduates at Franklin Pierce College. Projects have included oral history gathering to map out both human and ecological communities.

<http://www.fpc.edu/monadnockinstitute>

Loyola University, Chicago, IL - New Academy for Nature and Culture is a jointly sponsored initiative of Loyola University Chicago and Northeastern Illinois University and is housed within the Environmental Studies/Sciences Program at Loyola University Chicago. Courses in the cultural and ecological aspects of restoration ecology are offered. The program is directed by William R. Jordan, III, author of *The Sunflower Forest* (2003). I was unable to locate information on the

current status of program or what, if any, degrees are being offered at this time.

http://www.luc.edu/depts/envsci/new_academy.html

Northern Arizona University, Flagstaff, AZ - Center for Sustainable

Environment collaborates with other projects and programs at NAU including The Ponderosa Project, Ecological Restoration Institute, Center for Environmental Sciences and Education, Conservation Certificate program, and MS in Environmental Science and Policy program. The center is directed by Dr. Gary Paul Nabhan, author of several books on cultural ecology, including *Cultures of Habitat* (1997). <http://environment.nau.edu/index.html>

Rice University, Houston, TX - Shell Center supports interdisciplinary research in sustainability, develops educational material and methodology for high school, university, graduate school, and corporate settings, and provides community-based learning opportunities in sustainability to Rice students. The Center is sponsored by Rice's Environmental and Energy Systems Institute (EESI) and the James A. Baker III Institute for Public Policy and works closely with EESI and the Rice Energy Program. <http://shellcenter.rice.edu>

University of New Hampshire, Durham, NH - Office of Sustainability

Programs integrates sustainability principles and practice into all aspects of

university life including research, curriculum, operations, and public service.

Programs are organized around four initiatives: Biodiversity Education, Climate Education, Food and Society and Culture and Sustainability.

<http://www.sustainableunh.unh.edu/mission.html>

University of Wisconsin, Madison, WI - Center for Sustainability and the

Global Environment works with other programs at UW-Madison to offer degrees in conservation and sustainable development, rural sociology, and public affairs.

<http://www.sage.wisc.edu/>

APPENDIX C

FOCUS GROUP QUESTIONNAIRE

Name _____ Age _____ Gender _____

Ethnic/Cultural Background:

Academic Background (please list institutions attended, degrees earned, and major/minor areas of study)

of terms completed in LECL program

___ 1 term ___ 2 terms ___ 3 terms

___ 4 terms ___ 5 terms ___ 6 terms

___ 7 terms ___ 8 terms ___ 9 terms ___ other

Concentration area in LECL: (if undecided, please check all areas you are considering, or fill in other)

___ Sustainability Education

___ Feminism and Ecology

___ Urban Ecology

___ Agro-ecology and Food Systems

___ Eco-psychology and Nature Writing

___ Indigenous Knowledge and Knowledge Systems

___ Democracy, Justice and Citizenship

___ Community Health and Health Education

___ Indigenous Cultures and Ecology

___ Social Movements and Conflicts

___ Conservation and Green Economy

___ Watershed and Water Policy

___ Other _____

What LECL courses have you taken so far? (check all that apply)

___ Leadership for Sustainability

___ Global Political Ecology

___ Collaborative Ethnographic Methods

___ Ecological and Cultural Foundations of Learning

What do you hope to do with LECL degree?

APPENDIX D

QUESTIONS GIVEN TO STUDENTS PRIOR TO ATTENDING FOCUS GROUP

In addition, please reflect on the following questions that we will be discussing at the focus group.

What ecological knowledge (i.e. content) do you want to learn in your time with LECL? What ecological skills do you want to develop in LECL?

Compare and contrast your experience learning about ecology in LECL with past experiences learning about ecology you may have had. What is similar or different?

Has LECL changed the way you think about nature? If yes, how so?

Has LECL changed the way you experience your relationship to nature? If yes, how so?

What specific LECL courses, assignments, readings, community events have helped you to learn about the natural world?

- a. Of these, what has been most meaningful, and why?
- b. What has been least meaningful, and why?

What are you most interested in exploring about the natural world? What do you most want to learn? What are the questions you're curious about?

If you were to take a hands-on class that would address your questions about nature, how would you want to explore these questions? What methods of instruction/learning would work best for you?

What does the human-nature relationship mean to you?

How much ecology do you think a sustainability program like LECL should teach? What kind of knowledge/skills should be taught? What disciplinary approach/es should be used?

APPENDIX E

PROGRAM CURRICULUM FOR SUSTAINABILITY EDUCATION MASTER'S PROGRAMS

Antioch University, Seattle, Washington **MS in Community and Environment**

Required Courses (Credit Hours); Total Credits (66)

Systems Thinking for a Changing World (3)

Communication Design (3)

Ecological Sustainability (3)

Critical Inquiry and Ways of Knowing (3)

Global Pluralism (3)

Transformative Leadership & Change (3)

Reflective Practicum Seminar I -3 quarters (12)

Theory and Practice of Socio-environmental Change (3)

Economics and the Environment (3)

Environmental Policy and Decision-making Processes (3)

Integrative Environmental Science (3)

Reflective Practicum Seminar II 3 quarters (12)

+ 4 electives drawn from across programs offered at Center for Creative Change or students can design Independent Studies. (12)

Some students integrate environmental education into their program. Antioch's education classes may also be elected with departmental approval, Antioch's education classes incorporate social justice issues.

Audubon Expedition Institute, Lesley University, Belfast, Maine
MS Environmental Education

Required Courses (Credit Hours); Total Credits (39)

Overview of Natural History and Ecology (2)
 Systematic Investigations of Local Flora and Fauna (2)
 Outdoor Skills & Leadership (1)
 Water Systems: Effects, Interrelationships & Problems (2)
 Life Systems and Their Communication (2)
 Special Topic in Ecology (2)
 Philosophy of Education I (2)
 Methods in Environmental Education (3)
 Approaches to Research in Environmental Education (3)
 Environmental Education and its Applications (3)
 Anthropology: Cultural Perspectives of Human Communities (2)
 Culture, Spirit, and Ethics: Relationship to the Living Earth (2)
 or Science, Technology and their Effects on Nature (2)
 Ethics of Water and Land Use (2)
 or Sustainable Human Ecology (2)
 Outdoor Skills & Leadership (1)
 Learning Communities: Group Dynamics, Ethics & Decision-making (3)
 Learning Communities: Environmental Psychology (2)
 Learning Communities: Communication, Leadership, and Advocacy (2)
 Independent Study in Writing: Practicum Proposal (2)
 Practicum for Environmental Education (3)

This place-based program travels through a variety of bioregions and human communities.

Eastern Michigan University, Ypsilanti, Michigan
MA Social Foundations of Education, Ecojustice Concentration

Required Courses (Credit Hours); Total Credits (30)

Multicultural and International Education (2)
 Philosophy, Ethics & Teaching (2)
 History of American Schooling & Literacy (3)
 Sociology of Education (2)
 Teaching for Social & Ecological Justice (3)
 Ecojustice & Education (3)

Educational Research (3) - *students select from one of three research courses*
 Culminating Project/ Thesis (3)

+ 9 elective credits selected from the following:

Field Studies in Education (1-3)
 Workshop: Developing Curriculum for Sustainable Community, Elementary (3)
 Workshop: Developing Curriculum for Sustainable Community, Secondary (3)
 Wetland Ecosystems (3)
 Terrestrial Ecosystems (3)
 American Cultural Landscapes (2)
 Topics in Feminist Philosophy: Ecofeminism (3)
 Globalization: Race, Ethnicity, Class and Gender (3) (soon to be included)

New College of California North Bay, Santa Rosa, California
MA Humanities & Leadership in Culture, Ecology & Sustainable Community

Required Courses (Credit Hours); Total Credits (36)

Core Leadership Seminars:

Personal Leadership (6)

Role of Leader Within Community and Organizations (6)

Role of Leader in Building Social Movements (6)

Field Research (9)

Master's Thesis/Project (9)

All students take the Core Leadership Seminars. Field Research coursework is chosen according to the concentration area selected. The MA concentration areas are: EcoDwelling; Consciousness, Healing and Ecology; Ecological Agriculture; Holistic Nutrition; Activism and Social Change. Students may also design their own concentration area with the help of a mentor and develop a curriculum that includes facilitated group study, independent studies, and tutorials as well as practicum experience in the field.

Portland State University, Portland, Oregon

MA or MS Education, Educational Leadership in Ecology, Culture and Learning

Required Courses (Credit Hours); Total Credits (45)

Developmental Perspectives on Adult Learning (4)

Social Foundations of Education (4)

or Philosophy of Education (4)

Principles of Educational Research and Data Analysis (4)

Educational Organization and Administration (4)

Global Political Ecology (4)

Ecological and Cultural Foundations of Learning (4)

Collaborative Ethnographic Research Methods (4)

Leadership for Sustainability (4)

Electives in Area of Concentration (7-9)

or Practicum: Regional or International Internship (5-6 months)

Master's Thesis (6)

or Culminating Research Project (4)

Concentration areas: Sustainability Education; Feminism and Ecology; Urban Ecology; Agro-Ecology and Food Systems; Eco-psychology and Nature Writing; Indigenous Cultures and Ecology; Social Movements and Conflicts; Democracy, Justice, and Citizenship; Indigenous Knowledge Systems; Community Health, Conservation and Green Economy; and Permaculture. Students may also suggest new concentration areas.

Prescott College, Prescott, Arizona
MA Environmental Studies

Required Courses (Credit Hours); Total Credits (30)

Students interested in studying sustainability education may approach this from either an **education** or an **environmental studies** perspective. Each student must set goals in a statement of purpose, study relevant theory, develop competency in social and ecological literacies, research and research methods, and complete a practicum and thesis.

Students in the **MA Environmental Studies** program who are interested in sustainability education can concentrate in either *Environmental Education* or *Sustainable Science and Practice*.

For the *Environmental Education* concentration, students will study each of the following areas:

- Education
- Natural Sciences
- Human-Environment Interaction
- Environmental Stewardship

For the *Sustainable Science and Practice* concentration, students will draw from the natural sciences, social sciences and humanities to study and develop alternative theoretical and practical solutions for sustainable living. Sustainable community development and sustainability education are two areas of possible focus.

Saint Mary-of-the-Woods College, St. Mary-of-the-Woods, Indiana
MA Ecoliteracy

Required Courses (Credit Hours); Total Credits (36)

Concepts of Earth Literacy (4)
 Principles of Evolution and Change (4)
 Nature and Cultures (4)
 Justice and the Earth (4)
 Healing Earth (4)
 Integrative Project (4)
 Certificate Project (1)
 Integrative Seminar (2)
 Practicum (1-4)
 Topics in Earth Literacy (1-4)
