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ECOLOGICAL LITERACY IN TEACHER PREPARATION: URGENCY, AFFECT, & AGENCY

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Abstract

In this article I describe an elementary grades teacher preparation capstone course on education and global issues, where the focus is on nature and the environment. As part of this course students write a thesis paper, design a curriculum project, investigate and report on environmental advocacy, and read widely on the topic of ecological literacy. Additionally, they participate in an intensive study abroad trip to Costa Rica, where they are immersed in mangroves, rainforests and other natural settings, and visit several schools whose missions privilege environmental literacy. Student reflections on the entire course as well as on the immersion experience were collected and analyzed for emergent themes. Findings reveal that students were impacted primarily in terms of their knowledge, affect, and behaviors, and were inspired to promote ecological literacy and nature-based learning in their future classrooms. A primary means by which students (and instructor) were transformed and became further motivated to learn, experience, and teach others, was through the development of biophilia, which is our affinity for other life forms and our innate tendency to seek connection with nature.

Ecological Literacy in Teacher Preparation: Urgency, Affect & Agency

Introduction

When I was young, one of my favorites albums was Bob Marley's *Catch a Fire*. Decades later I have caught such a fire. For me it is slow burning and it burns from the inside out. It is also contagious—others catch it. This beautiful burning contagion is a growing biophilia, which E. O. Wilson (1984) hypothesized as our innate tendency to seek connection with nature. Biophilia allows for a deep love and reverence for all life forms, from fungi to the Earth herself. As a

teacher educator I have been compelled to tell others about this new love, not unlike someone who has discovered her soul mate. It has fueled a passion to cultivate this love for the Earth among my students—future K-5 teachers, who in turn want to cultivate it among their elementary grades students, in order to create a better world and to live lives in greater harmony with nature. This caring creates the motivation for wanting more knowledge and for wanting to become more literate about the Earth, her ecology, and our human place as nature, rather than as separate from or superior to nature. We live in a world in which with each passing day we are more inextricably linked—economically, socially and environmentally. This globalization requires us to be good global citizens if we are to survive and thrive. Learning about the Earth as our common home can promote more responsible local and global citizenship, greater well-being, sustainability, social justice, and ultimately the common good, where that is linked to stewardship of the Earth, which has its roots in education.

Education has as its Latin root the word *educere*, which translated means “to draw out” or to see the potential in something and then develop it. The preeminent ecologist David Orr (2004) suggests that what needs to be drawn out of us is our affinity for life, in order to build humane and sustainable societies. This paper is an attempt to describe how I was able, to some extent, to lead my students toward greater ecological literacy by seeing their potential for biophilia and by drawing out their affinity for life. The ultimate goal of my work with pre-service early grades educators is to develop ecological literacy, or “ecoliteracy,” which is “the ability to understand the basic principles of ecology—the processes by which the earth’s ecosystems sustain the web of life—and to live accordingly” (Stone, 2017, p. 36). A natural, authentic and efficacious path leading to this end is through developing social emotional intelligence, which begins with a budding biophilia, which has the power to transform the mind. This new mind, made possible through new awareness, often has as its starting point the recognition that we are of the Earth—oxygen, carbon, hydrogen, calcium, sodium and so on; we are wholly dependent upon the Earth’s elements and systems, a reality that now lives prominently in my consciousness.

The Study

In my current professional position I direct the undergraduate elementary grades teacher preparation program at my institution. As such, I have the privilege and responsibility to shape the program and to provide curricular leadership and intellectual guidance. I feel strongly that teachers need to know as much as possible about the complex world in which we are living. To this end, I recently added as program requirements a world geography course and a capstone course. The capstone course, which I developed and teach, is on Education & Global Issues, where our global issue focus is “Nature and the Environment.” I developed this course because I feel compelled to continually improve the program in order to graduate increasingly socially aware and ecologically conscious teachers, who will go into elementary schools, both public and private, able to promote ecological literacy, and thus our collective wellbeing. As part of this culminating teacher preparation capstone course we visit Costa Rica, a country known for its biodiversity and sustainable practices and policies. There we visit three schools, two of which are focused on teaching about the environment, and both do so in, through, and with nature. We

learn a great deal about species interdependence, the importance of biodiversity to maintaining ecological balance, and about advocacy, including the establishment of the critically biodiverse Children's Eternal Rainforest reserve in Monteverde, which my teacher preparation students learn was originally funded largely through the efforts of elementary grades students in Sweden holding bake sales!

In this paper I describe findings from data gathered from my pre-service teachers across two contexts during their capstone course on the environment. Of the fourteen female students in the course, ten went on the Costa Rica immersion trip; four students had other commitments and were unable to participate. This course was one of the immersion abroad trips supported by the liberal arts college at my institution, through which all students with financial need are supported, such that no student is unable to participate due to financial constraints. Toward the end of the intensive eight day immersion trip, the students—all future teachers, were asked to reflect and comment verbally on what had most impacted them regarding their study abroad experience, which came half way through the semester-long course during the university spring break. Notes were taken during this debriefing session in which each student shared her reflections at the end of the trip, while still in Costa Rica, regarding what had most impacted her about the immersion experience. At the end of the course, these same teacher candidates wrote final reflections, where they were again asked to focus on what had the greatest impact, but this reflection encompassed the entirety of the course and all fourteen students. (In both reflections students were also asked what they would recommend or change to improve the course and the immersion experience.) A content analysis was done on both sets of student reflections, looking for themes within each set of reflections, as well as across both sets of students' comments. For the final written reflections, students were told they could put their names on their reflections or not, whichever they preferred. Many chose to attach their names to these final reflections. Findings from students' reflections are discussed below, following a review of relevant literature, which provides context for the study and the student experience.

Educational Approaches & (Eco)Literacies for a New Age: The Anthropocene

We are living in a new human dominated epoch and geological era—the Anthropocene, the Age of Man, in which Earth's systems will be under increased pressure to support approximately 10 billion people by 2050 (Ellis, 2018), a mere thirty-one years from the date of this writing. This fact, along with other realities, including the 2018 International Panel on Climate Change (IPCC) report creates “an urgency we ignore at our peril” (Assadourian, 2017, p. 5). The Anthropocene is characterized by

...corrosive spillages and frightening excess of broken ecological boundaries, damaged ecosystems, poisoned oceans, plastic landscapes, deforested landscapes, toxic multispecies exchanges, nuclear holocausts and mushroom clouds piercing the once sacred demarcation between ground and heaven, rising carbon emissions, rising sea levels, oil spillages, loss of biodiversity, and proliferation of the horrific, evinced not merely in terms of genetic mutation but in our evolving analyses and capacities to notice

how bodies interpenetrate other bodies, often in monstrous and unpredictable ways. What the Anthropocene refers to is the stunning impact of human activity on a now damaged planet; the very conditions of this epoch imperil both those who are blameworthy and those who are ‘innocent’ (Akomoalfe, 2018).

Given the realities of this age, we must help our students to be hopeful and inspired about the future, knowing they can persist and make a difference, rather than feeling defeated and powerless, through what Macy & Johnstone (2012) refer to as “active hope.” Jensen (2006) claims that hope alone, without real action keeps us chained to the same system that created the current reality and is causing the destruction of the Earth. And he adds, only false hope would allow us to think that the system is going to inexplicably change; hope is a secular way of keeping us in line. Rather, he urges us to realize the agency we have to protect the people, things, and places we love (and is so doing become dangerous to those in power).

While students in the capstone course studied difficult material and seemingly intractable problems, their approaches and their work, including their curriculum units, advocacy projects and theses were creative, solutions-based, and diverse. At the university and program levels we are preparing students to be “career ready,” but also to be stewards and advocates who are prepared attitudinally and pedagogically to create a healthier, safer, and a more just and sustainable world. Clearly “career ready” for all elementary grades educators must come to include the knowledge, skills, affect, dispositions, and behaviors associated with an ecologically literate person. Indeed, one wonders why, given what we know, this is not already the case, (beyond what is too often only a cursory teaching of discreet environmentally related science standards).

There is a growing body of research and knowledge about the importance of Earth Education. We see this evidenced by the U.S. Department of Education’s designation and recognition of Green Ribbon Schools, the nature-based early childhood education and forest schools movements, our recognition of concepts such as “nature deficit disorder” (Loev, 2013), the growing field of ecopsychology—the study of our relationship to the natural world, as well as the growing interest in ecotherapy to bring about more balance and to address numerous issues, stresses, and disorders. Many states have developed “blueprints” or other frameworks for environmental literacy. Across many disciplines there is an increased interest in ecology. However, the silos in which higher education often operates, do not promote the type and degree of interdisciplinarity and systems thinking needed, but elementary grades teacher preparation is a place where the possibility for integration and interdisciplinarity is natural and relatively achievable, where such a goal exists.

A systems approach is critical, not just for understanding ecology, but in order to see the connections of all things, including our buying habits and the interaction of human and natural systems (Goleman, 2010) and the connection between policies and irrevocable planetary disasters (Orr, 2017). Offering students practical, relatable ways to see these connections of all kinds is important in terms of understanding our interdependence, which can also promote a

desire among students to be good stewards of our shared home. Across the grade levels teachers are required to meet standards and teach content linked to Earth education and the environment (for example, food webs, water cycles, energy systems etc.). Skilled teachers at all grade levels, from preschool on have always made these types of lessons accessible and comprehensible in age appropriate ways. Asking students to go the extra step in their thinking regarding their knowledge and application of this content to their lives is important in terms of students being able to use their learning to understand their impact and to make decisions. For example, even young students can do a very simple survey that will give them an idea of their carbon footprint, or their impact on the environment. One tool shows this in the number of Earths it would take to sustain one's lifestyle. David Orr argues that students attending public schools at all levels, from elementary to university should study water, understand its meaning, and become involved with local watershed restoration projects. He suggests that as we come to understand the meaning of water, we may well come to understand the meaning of being human, as water is the mother of all life. He states poignantly "When the waters again run clear and their life is restored we might see ourselves reflected whole" (Orr, 2004, p. 59). Such understandings are part of what it means to be ecoliterate.

Ecoliteracy

Frameworks. The Center for Ecoliteracy has distilled years of research and experience on ecoliteracy down to four basic principles—nature is our teacher; sustainability is a community practice; the real world is the optimal learning environment; and sustainable living is rooted in deep knowledge of place. Embedded in each of these are numerous other principles (Stone, 2017, p. 37).

There are various definitions of environmental education, environmental literacy, and ecological literacy or ecoliteracy, as well as attempts to tease out the distinguishing features of the various frameworks and approaches, where for example, some consider ecological literacy a subset of environmental literacy, but most frameworks share some version of similar key components around affect, knowledge, cognitive skills and behaviors (McBride, Brewer, Berkowitz, and Borrie, 2013). These frameworks and their components have evolved over time to include the concepts of sustainable development, resilience, as well as a "common worlding" approach (Nelson, Pacini-Ketchabaw, & Nxumalo, 2018; Taylor, 2017b) in which humans and more than human species live well together with the earth. McBride et al. (2013), explain that what most differentiates ecoliteracy from environmental literacy

...is the clear emphasis on sustainability, and the introduction of the spiritual, holistic components, expressed in terms of 'celebration of Creation' (Orr, 1992), 'spirit,' and 'reverence for the Earth' (Capra 1997, 2002, Center for Ecoliteracy 2013), and 'expansion of the soul' (Wooltorton, 2006). ...An ecoliterate person is prepared to be an effective member of sustainable society, with well-rounded abilities of head, hands, heart and spirit, comprising an organic understanding of the world and participatory action within and with the environment (p. 14).

McBride et al. further explain that Fritjof Capra and the Center for Ecoliteracy include in their framework the key components of most other frameworks, which are head (cognitive), heart (emotional-affective), hands (behaviors) and a fourth level being the spirit/connectional, which includes “experiencing wonder and awe toward nature, feeling reverence for the Earth and all living things, and a strong bond with and deep appreciation of place, *feel kinship with the natural world and invoke that feeling in others*” [emphasis added] (p. 15). Throughout my experience teaching the capstone course, it was the profound experience of this fourth feature that was radically transformational for myself, as well as for my students. Of course this spiritualism and experience with and of nature is not new and modern era Transcendentalists such as Emerson and Thoreau had written of these ideas well over a century prior. It is the explicit inclusion of them in different, less romantic and more dire contexts and as aspects of more recent educational models and ecological frameworks that has changed. A related and important key distinction in these various approaches is between those that are more human centric, versus those that are more ecologically inclusive and less anthropocentric, where the latter take into consideration the value of all life, sentience, and earth forms, beyond their primary usefulness for sustaining human life on the planet and where humans are perceived as primary, separate from, or superior to all other life forms.

A major organizational force doing important work in this area is the North American Association of Environmental Education, which has developed many resources, including the Environmental Issue Forum. In 2011 it published a framework for assessing environmental literacy, which details specific competencies, knowledge and dispositions, which lead to and allow for particular behaviors and “action competence,” as well as their definition of an environmentally literate person as

...someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well being of other individuals, societies, and the global environment; and participates in civic life. Those who are environmentally literate possess, to varying degrees particular knowledge and understandings of a wide range of environmental concepts, problems, and issues; a set of cognitive and affective dispositions; a set of cognitive skills and abilities; and the appropriate behavioral strategies to apply such knowledge and understanding in order to make sound and effective decisions in a range of environmental contexts. This definition treats the primary elements of environmental literacy—the cognitive (knowledge and skills), affective, and behavioral components—as both interactive and developmental in nature. That is, individuals develop along a continuum of literacy over time—they are not either environmentally literate or illiterate (Hollweg et al., 2011, p. 5-16).

As explained here, it is important to understand that environmental literacy, like all other types of literacy, is developmental. Students become literate over time—at no point is a student either fully literate or illiterate. Fundamentally, an ecoliterate person understands that as a species we are dependent upon the earth and have a deep need for nature, especially given the world of

social media and technology in which most of our lives are situated. We are coming to better understand the realities of nature deficit and our need to cultivate biophilia, as well as the many benefits of learning in and through nature. Students in the capstone course experienced learning in and with nature across multiple contexts, for example, as they did nature-based art in the rainforest as a form of personal expression, visual literacy, and reflections of lived experience, which included, for instance, a tribute to a deceased loved one and recognition of a life moving toward greater balance over time.

Provocations. However, even this approach of immersing students in nature is problematic in that it presupposes that we are outside of and separate from nature, and so needing to go ‘into’ or “back to nature” (and in the case of the capstone course this was achieved somewhat ironically by creating a large carbon footprint by flying to a foreign country to be in nature). Nelson et al. (2018) make this point regarding the concept of *returning to nature* and argue that nature-based education is often against a backdrop in which nature is “utilized” in an extractive, colonial, and anthropocentric approach characterized by human exceptionalism, where children are viewed as future fixers, rather than in a common world with all other humans, as well as the more than human.

Nelson and colleagues present this “common worlding” approach in which humans are not the “keepers” of this common world, but where human and the more than human attempt to live well together. She and her colleagues investigate a wide range of ideas and issues with young children in forest schools through exploration and inquiry, including concepts such as sentience and climate change, where for example students learn that trees “talk to each other” and also sweat, seed clouds, change weather patterns, and indeed are sentient beings. This work is important for several reasons, including the emphasis on indigenous presences and consciousness surrounding indigenous lands and ways of knowing (which have been appropriated quite literally, and physically, in the case of the former), resistance to human centered frames of reference, and questioning and problematizing of dominant assumptions regarding nature-based and environmental education. Learning to think and perceive outside of our usual paradigmatic prisms is fundamental to becoming more ecoliterate. Teacher preparation programs can promote this by guiding students to become cognizant of the frameworks within which they are operating—political, ethical, social, economic, and so on. One fundamental way in which the social and ethical come together meaningfully and in potentially powerful ways that can and do promote ecoliteracy is through cultivating social emotional learning and intelligence.

Pathways. Within the study and practice of ecological literacy, it is generally well understood that social emotional learning is a primary pathway toward becoming ecoliterate. New pathways become perceptible as we develop our ecoliterate consciousness and begin to question dominant paradigms and their consequences, including, for example, neoliberalism (Martínez-Rodríguez, Vilches Norat, and Fernández-Herrera, 2018). Becoming ecoliterate allows us to considering alternative philosophies and other ways of existing and interacting in the world, ways which may help to walk us back from the edge of ecocide, such as the African concept of *Ubuntu*, meaning “harmony,” but more broadly where everything in the cosmos is connected and we therefore

have a moral obligation to care for other people, species, and the Earth (Rodenberg and Bell, 2017). *Ubuntu* embodies the combined essence of social emotional intelligence and ecological intelligence. For future elementary grades teachers in particular, their first step on an ecoliterate path can begin with the understanding that “all education is environmental education...by what is included or excluded we teach the young that they are part of or apart from the natural world” (Orr, 2005, p. xi).

Findings

Many of the components of ecological literacy described above, including understandings, dispositions, and behaviors emerged in various ways in students’ course reflections. A content analysis of the students’ final course reflections showed that they were impacted in three main ways, all of which intersected, where the main categories of themes that emerged were:

- Greater knowledge and awareness of ecological issues or ecoliteracy, and a desire to teach what they had learned to their future students;
- Affective changes and relationships, with self, others, nature, and the Earth—a growing biophilia and social emotional intelligence;
- Behavioral impacts and a sense of agency, which included inspiration and awareness of one’s ability to make a difference in the world and to promote social justice, as well as to reflect on one’s actions.

The following illustrative excerpts reveal ways in which these main themes emerged separately, as well as how they overlapped within students’ written statements. I underlined these main themes in the first quote below in order to illustrate this—how themes emerged separately and how they overlapped. One student wrote:

“This class exposed me to so much information regarding the environment. I was not aware of how much it would influence me as a future educator. I grew a love for nature. The relationships I made in this class, the immersion experience, and the research done truly changed my life for the better. I am so grateful for this class and cannot image my [college] experience without it or without all of you.”

Another student in the course, who did not go on the Costa Rica immersion trip, wrote:

“The most impactful part of the class was the environmental consciousness that I gained. This gave me a sense of purpose as a teacher and a student in that it made me passionate about being an advocate for environmental literacy and made me feel like I can make a difference. This class changed me in so many ways and brought new meaning and purpose to my life. For the first time in a long time I was excited and hopeful for a future

where I can make a difference. This class made me want to get out of bed and plan for the future. It made me want to be alive, because there was something I felt I had to do.

A second student who did not go on the immersion trip wrote:

“This class has taught me many things, not only as a future educator, but as a citizen of the Earth. As a teacher, learning about all of the benefits of outdoor and environmental education for young students, will help me integrate them into my teaching. As a person, learning about my impact on the world, all the little things I do and can do to help the environment, and ways to influence others, has altered my view of how I go through each day.”

Several students expressed similar sentiments around the issue of responsible local and global citizenship and reported that they felt a sense of responsibility to teach students about the Earth, how to be good stewards of it, to help them to develop a love of nature, as well as to have experiences in nature. Rather than feeling overwhelmed by the state of the environment, many used the word “excited” and described feeling ready and eager to teach Earth and environmental education to their students. Many students also wrote about how the course had inspired them to make changes in their own behavior, which included changing their diets, their daily practices to reduce their carbon footprint, and greater involvement with and advocacy around issues of ecology, sustainability and ecological justice. The following illustrative excerpt demonstrates that students understand that these issues (and the major themes that emerged in their writings) are interrelated. When writing about what was most important and impactful to her, one student wrote, “...learning about all of the benefits of Earth Education and learning how beneficial it is to students—the social justice aspect, environmental literacy, social emotional intelligence and so forth.”

This (anonymous) student’s writing was preceded by an ante script, written in cursive that read “Love you” followed by a heart. I note this not to show that I am loved by my students, but rather to highlight the affective relationship that developed among participants, including the instructor with the students. This is important because we cannot meaningfully separate out affect from cognition. How students feel about the instructor and each other and the quality of their relationships matters (Cozolino, 2017; Palmer, 2017). Our collective experience of a growing biophilia contributed to the positive affect we experienced, because we were transforming together—catching the fire and sharing it. Like many of my students, I grew up in a context in which nature and the Earth were to be used, and in many cases abused to promote human “progress,” convenience and even security. Many of us did not see ourselves deeply, clearly or authentically as nature. Through the semester long course and through spending eight days immersed in nature, we changed, myself as much as my students. Indeed, for me, this course was the most transformational experience of my decades-long career. Many students were moved to tears in explaining the impact and transformational nature of the Costa Rican immersion experience on them.

Immersion Abroad and in Nature

As we sat outside on the patio at our field station on the penultimate day of our trip, we each shared what we felt was most important about what we had learned and what had most impacted us. Student comments revolved largely around issues of environmental appreciation and being moved by their experiences, for example the night hike through the Children's Eternal Rainforest, the daylong exploration of the cloud forest, and our boat tour of the mangroves. Not surprisingly, many students talked about wanting to foreground environmental literacy in schools and to provide opportunities for their future students to learn in and through nature, to explore more, and to take risks. Several students spoke about having a greater sense of purpose and wanting to bring back home with them aspects of what they had observed and learned. Several students explained that they had become more passionate and this passion was shared with others throughout the experience. One student stated that she witnessed how important it is for the teacher to be passionate about the content and topics being taught (and in this case she was also referring to our in-country field guide, a highly passionate and deeply knowledgeable biologist and educator who views teaching as a form of philanthropy—giving freely of self). Students also commented on what they saw as positive aspects of Costa Rican society in general, such as the calmer pace of life and a “friendly vibe.” They also noted that there was an authenticity to the nature-based activities in Costa Rica, versus what some had experienced in the U.S., where for example a family hike might be undertaken in order to get exercise or as part of weight loss or fitness goal. In Costa Rica, one student “loved that every little thing had a story and that we stopped to appreciate them.”

As noted previously, the trip included visits to three schools—one public and two private, where both private schools had a stated environmentally focused mission and were bilingual. In the public school, where we also did a service project, the teacher preparation students were struck by the genuine care and affection teachers, all females in this case, showed to students, including playing soccer with the elementary grades students on a hard blacktop surface during recess. One student shared that her mother used to comment that it is “one thing to take kids to park, but it is another to actually play with them.” Students commented on how the schools visited were happy places “full of laughter.” One student said she was reminded to create learning in ways that make students think and to also allow students to learn at their own pace.

Many students commented on the Quaker Friends' school visit, where we spoke at length with the Director, observed in classrooms, and participated in the Friends' “meeting” in which the school's students, faculty, staff, and community members sit in silence, unless someone feels the need to share something. After a long silence, one student rose to speak about the Chinese artist and human rights activist he was learning about and shared with the group details of the oppression the artist activist had experienced. A visiting American woman rose to speak about how her adopted daughter could not get a visa to come to the U.S. with her, and how the U.S. had recently intervened in elections in the adopted girl's Central American nation. The woman

later told me that her daughter is from what the U.S. President referred to as an ‘s’ hole nation, thus making obtaining a visa even more difficult. Several students commented on how the trip had allowed them to become more spiritual and to practice mindfulness and how they admired the Quaker silence and mindfulness, as well as how at the meeting people greeted each other in peace. This was a minor theme in the students’ written reflections as well. For example, one student wrote, “...*I also appreciated learning about mindfulness and making conscious choices to help to create a sustainable world....*” Our literacies do not remain separate—like real life, they are integrated, and inevitably learning about the earth extends into and overlaps with all other aspects of society—including politics. Students were focused on environmental literacy, but learned other literacies at the same time, in this case political and critical literacies. These also came together in the Quaker Friends’ School visit by learning about the origins of this group, who as pacifists refused conscription in the U.S. military during the Korean War. Subsequently, they sought out a country with no military, where their peaceful orientation and respect extends quite literally into nature, where the school is nestled in a rural mountain forest.

Discussion: Biophilic & Ecoliterate Effects

The effects of social emotional intelligence, biophilia, and ecoliteracy are widespread and extend far beyond ecology. Consider the implications at the classroom and school levels on student behavior, on school culture and climate, inclusiveness, respect, even reverence for self, others, and all life forms. The impact of greater empathy, understanding, and becoming more aware of self and others is immense and growing, as reflected in the movements toward more mindfulness in education and nature-based learning, both of which promote social-emotional learning and have additional emotional, physical, and academic benefits for students. By the end of our capstone course, future teachers were able to thoughtfully address and respond to prompts such as:

- Discuss the value of elementary grades students studying the environment, developing biophilia, and becoming ecoliterate?
- Why is learning about and being in nature important in terms of developing respect for life, social-emotional intelligence and ecological literacy? What is the relationship among these?
- How can an education characterized as biophilic and ecoliterate better serve oneself and society?

Promoting our common good includes requiring students to think beyond their own immediacy and self-interest. The ability and opportunity for students to do so is critical not just for our wellness as individuals, but for our and other sentient beings’ very survival on the planet. From the nation’s inception, the dominant culture has promoted and rewarded individualism and self-interest. This has extended to a view of the Earth as a resource for us to use. Too few of us were ever taught to think of the Earth’s resources as finite and to have a reciprocal relationship with the Earth. Our view of nature is often that we are separate from it, rather than that we *are* nature, a worldview indigenous peoples have always possessed. This dualistic worldview has had

devastating consequences and we are seeing the effects in new realities such as “once in a century” hurricanes and other massive storms that are occurring on a regular basis, as well as hugely devastating droughts, floods, fires, increasing numbers of climate refugees, and national security issues linked to environmental concerns. Being good local citizens is no longer sufficient; we are required to be and to teach our students to be good global citizens as well, where this includes understanding issues of environmental justice and the disproportionate effects of environmental devastation on the poor. Students need to be given opportunities to weigh the costs and benefits of their decisions. Developing critical consciousness, ecoliteracy, and the ability to think beyond the immediacy of one’s self or one’s gratification can begin at the youngest age, where a child would consider the impact of throwing a piece of plastic on the ground by understanding it will eventually end up in the ocean, or learning about the importance, indeed sacredness of water and not wasting or polluting it. We can enhance what may be our innate capacity for equity and justice, just as we can promote what may be an equal propensity for the opposite, where we have many centuries of evidence to support the latter.

Recommendations

The main assignments for the semester long course allowed students to connect what they were learning about Earth education and ecoliteracy to self, schools, and the larger community, while also connecting the local to the global. Primary assignments included readings and films on a wide variety of topics, a set of reflection papers on the readings and facilitation of a set of readings, knowledgeable interaction with a series of expert guest speakers, a group curriculum design project, a community based advocacy project, a thesis, and the immersion experience, which required them to share in deep reflection about the experience--both verbally and in writing. However, the following recommendations are applicable to any teacher preparation course focused on developing ecoliteracy.

- Begin with having students examine their own relationship to the Earth; ask them if they see themselves as separate from or *as* the Earth. Ask them to recall their favorite times in nature and to examine what messages they were given about nature throughout their lives. In my course this was coupled with students writing a modified ‘Where I’m From Poem’ and reading *Love Letter to the Earth*. Most students come very quickly to understand they are not separate from or superior to nature, rather, that they are in fact nature; a new understanding, which surprised many of them.
- Link theory with practice. Don’t merely read about what a carbon footprint is and have students calculate theirs, but talk about how that might be linked to consumerism and our economic system and what can be done about it in our individual lives (where for example one student became very interested in the minimalist approach to living, which many of her generation have embraced). Discuss why knowing better does not always result in doing better, where developing new habits and ways of living our everyday lives requires consciousness and commitment.

- Go outdoors; learn in nature; explore (even if it is just the campus) while discussing readings. Ideally do site-based visits to waterways, forests, green spaces and notice where life flourishes against the odds in largely urban and concrete settings. Encourage students to work collaboratively in project groups and to address real world issues and problems. During discussion sit in a circle; use the Socratic method and allow students to learn from one another through deep and sustained discourse.
- Give students responsibility for facilitating readings and allow them to construct their own learning experiences and meanings. As part of their facilitation of a set of readings, one pair of students had their classmates do a scavenger hunt of flora and fauna on our campus, where students discovered approximately 15 specific species within the same number of minutes as part of our discussion of *Last Child in the Woods*. They also shared a video of the author discussing nature deficit disorder, facilitated discussion of key quotes and passages from the reading, and led us in a guided meditation on yoga mats they had arranged under a tree on the lawn outside our classroom.
- Allow students to pursue their own passions and interests, which in our course meant choosing the focus of their curriculum project, capstone thesis paper, which set of readings to facilitate, and the advocacy organization with which they participated during the semester. Many students will choose to work in one area across these assignments, for example around the issue of food, which might involve work and study in a community-school garden in an urban school located in a food desert. In this way students build up expertise based in an area of personal interest to them.
- Require students to participate in and report on the work and impact of some local community-based environmental organization. In my course they have to research other organizations with a similar mission globally.
- Allow and require students to be creative and to apply what they are learning in collaboration with others, such as designing a curriculum project with authentic assessments (not focused on writing lesson plans) for a multi-week unit they could actually teach in the near future. In my course one of the requirements for this unit is that it must include nonfiction reading, where for example a unit on trees might feature reading one of the children's books written about the Nobel Peace Prize recipient Wangari Maathai, known as 'the woman who planted millions of trees'.

These examples are specific to the course described here; however, at a more macro level they are also aligned with the five primary principles for developing ecological literacy, which are Earth dependence, Interdependence, Creativity, Deep Learning, and Earth Centric Leadership. These constitute a set of core proficiencies schools must emphasize if humanity is to survive the next century (Assadourian, 2017, p. 8) and can be thought of as a kind of Common Core for ecoliteracy.

Conclusion

I developed the course on nature and the environment out of concern about the state of the planet. Importantly however, I approached this change making from a place of personal agency and optimism, rather than from a sense of desperation, which can be debilitating and prevent positive action, when it leads to feelings of fear, powerlessness and defeat, which is not uncommon when encountering seemingly unsolvable problems. When studying the environment in particular, students tend to focus on catastrophe rather than potential (Kervin, 2019). In teaching about nature and the environment (and other difficult current issues or historical events), as teachers we have to be careful to be realistic, yet allow students to remain hopeful and feel empowered. Indeed, how we teach is as important as what we teach. The students in my capstone course are 19-21 years old—still very young adults. They, like their future students are inundated by social media and are preoccupied with thinking about themselves. As preteens, then as adolescents, and now as young adults, even their biology is promoting a self-consciousness that mirrors and reinforces the social milieu of a “selfie” generation in a dominant culture that generally rewards egotism, individualism and self-interest. The most important thing we as educators can do is allow and indeed require students to consider not just their own, but others’ best interests and recognize that ultimately, these are the same thing, more often than not. We must help students to consider our collective wellbeing, the future of this beautiful planet, and to take meaningful action as aware, responsible, local and global citizens. As stated previously, one of the books my teacher preparation students read is *Love Letter to the Earth* by Thich Nhat Hanh. Asking all students to write such a letter addressed to “Dear Mother Earth,” might be a good place to start in terms of promoting biophilia and developing eco-consciousness and ecoliteracy. It is important for all of us, students and teachers alike, to develop greater biophilic consciousness and ecological literacy from a sustainability perspective, but also because they have the potential to transform us at the deepest levels--where we live, both literally and figuratively. “It is more than a ‘paradigm change’. It is a change first in our loyalties, affections and basic character, which subsequently changes our intellectual priorities and paradigms...and over time alters the character of our entire civilization” (Orr, 2004, p. 145).

Teachers across grade levels and subjects can play a key role in our collective wellness, indeed our very survival, through a greater focus on learning about the Earth and promoting ecological literacy. This type of literacy expands awareness of our interdependence and cultivates caring about life, about self, and about others. Earth education and ecological literacy can also cultivate responsible local and global citizenship, which in turn can promote sustainability, social justice, and ultimately the public good. Through Earth education students can cultivate biophilia and a desire to affiliate with all living forms and sentience and possibly come to perceive the animism in all Earth forms, from mountains and meadows to rivers and oceans. This affiliation can help students learn to think beyond themselves and can help to empower them to make decisions and take actions in their lives that have positive impacts. Helping students to cultivate biophilia and

develop ecological literacy has academic and as well as social benefits for our individual and collective wellness, where the collective includes all forms of life, as well as the Earth herself.

References

- Akomolafe, B. (2018). When you meet the monster, anoint its feet. *Emergence*, 3. Retrieved from <https://emergencemagazine.org/issue/technology/>.
- Assadourian, E. (2017). Introduction. In *EarthEd: Rethinking education on a changing planet* (pp. 3-20). Washington, DC: Island Press.
- Cozolino, L. (2017). *The neuroscience of psychotherapy: Healing the social brain*. (3rd edition). New York: W.W. Norton & Co.
- Ellis, E. C. (2018). *Anthropocene: A very short introduction*. Oxford, UK: Oxford University Press.
- Goleman, D. (2009). *Ecological intelligence*. New York: Crown Publishing.
- Hollweg, K. S., Taylor, J. R., Bybee, R. W., Marcinkowski, T. J., McBeth, W. C., & Zoido, P. (2011). *Developing a framework for assessing environmental literacy*. Washington, DC: North American Association for Environmental Education.
- Jensen, D. (May/June, 2006). Beyond hope. *Orion Magazine*. Retrieved from <https://orionmagazine.org/article/beyond-hope/>.
- Kervin, C. (January 29, 2019). Crisis and creativity in environmental pedagogy. *Edge Effects*. Retrieved from <http://edgeeffects.net/environmental-pedagogy/>.
- Louv, R. (2008). *Last child in the woods: saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.
- McBride, B. B., Brewer, C. A., Berkowitz, A. R., and Borrie, W. T. (2013). Environmental literacy, ecological literacy, ecoliteracy: What do we mean and how did we get here? *Ecosphere*(4) 5, 67. doi:10.1890/ES13-00075.1
- Macy, J. and Johnstone, C. (2012). *Active hope: How to face the mess we're in without going crazy*. Novato, CA: New World Library.
- Martínez-Rodríguez, M. F., Vilches Norat, M., & Fernández-Herrería, A. (2018). Challenging the neoliberal view of education: the Center for Ecoliteracy as a transformative educational practice. *Globalizations*, 15 (3), 432-436. doi:10.1080/14747731.2018.1446601
- Nelson, N., Pacini-Ketchabaw, V. and Nxumalo, F. (2018). Rethinking nature-based approaches

- in early childhood education: Common worlding practices. *Journal of Childhood Studies*(43)1, pp 4-14.
- Nhat Hahn, Thich. (2013). *Love letter to the Earth*. Berkeley, CA: Parallax Press.
- Orr, D. (2004). *Earth in mind: On education, environment, and the human prospect*. Washington, DC: Island Press.
- Orr, C. (2005). Foreword. In M. Stone & Z. Barlow (Eds.), *Ecological literacy: Educating our children for a sustainable world* (pp. ix-xii). San Francisco: Sierra Club Books.
- Orr, D. (2017). Foreword. In *EarthEd: Rethinking education on a changing planet* (pp. xv-xviii). Washington, DC: Island Press.
- Palmer, P. (2017). *The courage to teach*. 20th Anniversary edition. San Francisco: Jossey-Bass.
- Rodenburg, J. & Bell, N. (2017). Pathway to stewardship: A framework for children and youth. In *EarthEd: Rethinking education on a changing planet*. (pp. 61-71). Washington, DC: Island Press.
- Stone, M. K. (2017). Ecoliteracy and schooling for sustainability. In *EarthEd: Rethinking education on a changing planet*. (pp. 35-47). Washington, DC: Island Press.
- Taylor, A. (2017a). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Education Research*, 23 (10), pp. 1448–1461.
doi:10.1080/13504622.2017.1325452
- Wilson, E. O. (1984). *Biophilia*. Cambridge, MA: Harvard University Press

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Musetti, B. (2018). Standards-based reform. In J.I. Lontas, (Ed.). *The TESOL Encyclopedia of English Language Teaching, First Edition, Organizational and Administrative Issues*. (pp. 4344-4350). Boston, MA: Wiley-Blackwell.
doi:10.1002/9781118784235.eelt0113

Musetti, B. (2018). Project planning and sustainability. In J. I Lontas, (Ed.). *The TESOL Encyclopedia of English Language Teaching, First Edition, Organizational and Administrative Issues*. (pp. 4318-4324). Boston, MA: Wiley-Blackwell.
doi:10.1002/9781118784235.eelt0134

Musetti, B., Salas, S., & Murray, B. (2016). Humanizing the core. English Language Learners and culturally-sustaining Young Adult Literature. In L. de Oliveira and M. Shoffner (Eds.). *Teaching English Language Arts to English Language Learners*. (pp. 107-125). London: Palgrave Macmillan UK.