

Cultivating Intimacy with the Natural World: College Students' Care, Connection, and Regeneration in an Agriculture-focused Humanities Course

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Abstract: To address solutions to environmental degradation in an authentic context, this qualitative research study examines college students' responses to outdoor fieldwork in an agriculture-focused humanities course. Students' responses to fieldwork on organic farms generated three integrated themes. Active care encompasses students' actions of care for plants, people, and animals; intimate connection includes feelings of kinship with people, plants, land, farmer networks, and love of farming. Of particular interest is the third theme of regeneration, related to actions ensuring flourishing of future generations of humans and the natural world. The study raises questions about the need for significant curricular change in higher education to prepare students to respond effectively to climate unpredictabilities and environmental degradation.

Keywords: active care, fieldwork, intimate connection, organic agriculture, regeneration

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Introduction

Unless institutions of higher education embed concepts and practices of sustainable environmental education throughout their programs, graduates will confront urgencies of escalating environmental degradation without the knowledge, skills, and resilience that build the “ability to persist and adapt” to unpredictable environmental conditions (Adger, 2003). Despite this pressing challenge, the Executive Director of the Association for the Advancement of Sustainability in Higher Education states that, among thousands of universities and colleges in the U.S. and Canada, just several hundred offer environmentally-focused courses. Such courses too often target students in discrete disciplines and may not include essential orientations of compassion, interconnectedness, and care toward others and the ecosphere (Rowland, 2013). Orr advocates that we “educate generations of ecologically literate change makers” (Orr 2009, p. 177), which requires altering not only the process of learning but also the substance of what is learned. How humanity proceeds to ensure the flourishing of current and future generations poses “the greatest moral, intellectual, and social challenge that human civilization has ever faced. ‘Business as usual’ will not work” (Thomashow, 2014, p. 211).

Emphasizing that our common future relies upon humanity’s “capacity for intimacy in our human-Earth relations,” Thomas Berry prodded educational systems to “see their purpose not as training personnel for exploiting the Earth but as guiding students toward an intimate relationship with the Earth” (1999, p. x). Educators tend to prioritize students’ acquisition of knowledge and skills geared toward economic gain, consumerism, and material comfort (Carp, 2013; Orr, 2009; Sterling, 2010) rather than developing knowledge and skills grounded in biophilia, the human proclivity to connect with life in its myriad forms (Wilson, 1984).

The urgency of addressing environmental degradation, resource and biodiversity depletion, and climate unpredictability calls for shifts in the “paradigms, policies, purposes, and practices” that guide higher education (Sterling, 2008, p.1). Rather than tinkering toward change by sprinkling sustainability courses throughout a degree program, sustainable education, as Sterling defines it, entails: “a change of educational culture . . . It is therefore a transformative paradigm which values, sustains and realises human potential *in relation to* the need to attain and sustain social, economic and ecological well being” (pp. 1-2).

A rich discussion is exploring how undergraduate education can address the growing crises in the human-natural world relationship. Miles calls for a need for “life-centered values” in the curriculum, with the aim of “creating new life-sustaining futures” (2002, p. 23). Chief Oren Lyons advocates not interfering with natural laws but working with them, particularly the “great cycles of regeneration, great powerful cycles of life regenerating and regenerating and regenerating” (2008, p. 24). Clover adds, citing a document from Great Britain’s National Institute of Adult and Continuing Education: “It is imperative that contemporary education work toward new relationships based on values of caring and respect but also ‘beauty, diversity, and [an] interest in life forms and natural systems’” (2002, p. 167).

To explore possibilities within education for sustainability, we pose the following question: how do college students respond to outdoor fieldwork experiences in an agriculture-focused humanities course? We examine students’ responses to fieldwork that opened opportunities to

engage with the natural world, specifically with plants, processes of agriculture, and food systems, as well as with people who work in food systems and with fellow students.

Educational Obstacles to Regenerating the Human-Earth Relationship

Although educational institutions are increasingly acknowledging their role in anchoring sustainable perspectives and practices, at least three obstacles impede progress. One obstacle to incorporating sustainability into higher education is the lack of concrete experiences with the natural world provided to youth by their families and K-12 schooling. Unless they have participated in outdoor immersion with families or peers, many incoming college students lack knowledge and skills and may feel fear or discomfort in the outdoors (Chawla, 2001; Powers, 2004). Moreover, it is not uncommon for children and youth to spend less out-of-school time in unsupervised outdoor play than their parents did, and have little familiarity with plant and animal names, habits, and benefits (Louv, 2008). As Nabhan explains, this reduced outdoor time diverges from previous generations' home habitat exploring, natural object collecting, hearing and repeating elders' oral traditions, and sharing side-by-side wanderings to absorb the stories and meanings of those places. Fewer family members identify and collect edible wild foods, care for plants and animals, read weather patterns, or negotiate complex terrain. Such experiential learning has been central to children's ecological education over millennia, yet today, "the percentage of children who have frequent exposure to wildlands and to other, undomesticated species is smaller than ever before in human history" (Nabhan, 1997, p. 64). School learning from books and media has replaced and devalued oral transmission and experiential education in the outdoors. As early as 1948, Aldo Leopold summarized the negative impact of these changes on environmental well-being: "We can be ethical only in relation to something we can see, feel, understand, love, or otherwise have faith in" (1949, p. 214).

A second obstacle emerges from the industrial-technological era in which we live, particularly from individualistic, competitive, and short-sighted social systems that work against sustainability; in such an era, care, love, and connection are urgently needed to focus disparate visions of cooperative flourishing and human goodness (Meadows, Randers, and Meadows, 2012). While leadership to promote change is known to depend on development of problem-solving, critical-thinking skills, and increased sensitivity to relevant human cultural values (Rowe and Johnston, 2012), less-explored are the role of connection and compassion in preparing students for change-agent behavior.

A third obstacle to sustainable education further reflects our industrial-technological era. College students tend to adopt societal assumptions that an abundant supply of goods and services will continue endlessly; students may not recognize that ongoing supplies of goods such as food, and the ongoing well-being of the natural world and its inhabitants, require environmental regeneration. Regeneration rests on allowing nature's ability to heal itself, on knowledge and skills from indigenous cultures, and on deliberate efforts to support nature's renewal (Bradley and Ellis, 1997). A long-term commitment to regeneration of the "sustainability of our species" resides in decision-making based on the "most fundamental things: What is in the best interests of future generations of the peoples of the world and of other species of the world?" (Mohawk, 2008, p. 58). The goal is to create sustainable environments that build a natural heritage for current and future generations, through "restoration,

regeneration, and resilience,” to allow thriving in unpredictable climate conditions (Nabhan, 2013).

Methodology

Our aim to understand students’ perspectives about outdoor fieldwork experiences guided our selection of an interpretivist theoretical paradigm based on our assumption that realities are multiple and represent diverse viewpoints (Creswell, 2013; Denzin and Lincoln, 2011). Methodological decisions grew from our analysis of student-generated texts. Upon a first reading for emergent categories through open coding, major categories seemed to reflect Noddings’s model of caring, in which mentors and teachers facilitate students’ development of an ethic of care by demonstrating care for others (including plants, animals, and places); engaging students in open-ended dialogue to understand and guide caring responses; providing opportunities to develop skills and attitudes of care; and finally, confirming students’ best efforts at caring and creating a vision of a “better self” (Noddings 1992, p. 25).

As we reread and recoded the data, students’ responses revealed concepts, such as intimate connection to the natural world and regeneration, which led us to expand on Noddings’ model. Our textual analysis of student responses thus allowed concepts and an integrated theoretical model to emerge through a grounded theory research methodology. We relied on inductive logic, explored a phenomenon in its authentic context, examined specific rather than general facets of student writing, and amended our inquiry questions throughout the research process (Bryant and Charmaz, 2011; Creswell, 2013; Denzin and Lincoln, 2011). We drew upon our values and background as organic gardeners and permaculturists throughout identification, analysis, and interpretation of research evidence (Bryant and Charmaz, 2011).

Methods

Participants and Context

Our courses approach agriculture through humanities frameworks including ethics, history, and religious studies, and social science frameworks including education. Here we focus on one course, taught by the second author, “Growing into Justice through Agriculture” (offered in alternate years as “Growing into Sustainability through Agriculture”). The elective course is open to all students at Villanova University, a four-year Catholic University outside of Philadelphia. Participants in this study include 38 of the 39 students who enrolled in the course over two years (one class of 16 and one of 23). One student in 2013 failed to submit a fieldwork log, reducing our sample to 38. Of the 39 students, 29 were seniors, seven juniors, and three sophomores. All but six of the 39 students were Caucasian; students’ socio-economic status is unknown. In the first year, 14 of the 16 students were female, and in the second year, 13 were female and 10 male. Twelve were majoring in environmental science, 12 in various humanities disciplines, seven in engineering, five in various science disciplines, and three in business. We refer to students and the three farms where they worked by pseudonyms. The elective course met a variety of requirements including Cultural Studies, Diversity, Peace and Justice, and Environmental Science. A large majority of the students displayed significant passion for the topic and were eager to engage in class discussions, fieldwork, and research projects in which they explored the course’s relevance to their post-graduate plans. To date, at least 11 students

have chosen to spend their first year after college working in fields related to agriculture and food justice.

Course aims include developing students' knowledge of environmental, human, plant, and animal degradation in industrial farming, and developing students' knowledge and skills related to sustainable agricultural approaches. The sustainable agricultural practices we emphasize include organic, permaculture, and biodynamic approaches; students encounter these in scientific sources, humanistic essays, biographies of or interviews with farmers, films, individual research projects, and during farm work. The experiential learning component includes 8-10 hours of required work on urban and suburban organic farms, some of which are located in economically challenged communities, plus a weekend field trip to an inner-city farm.

While we include scientific readings, the majority of assigned readings focus on ethical, spiritual, and cultural issues relevant to sustainable agriculture. Before embarking on fieldwork, students encounter problems in conventional agriculture through readings and lecture. They read the agrarian essays of Wendell Berry before classroom discussion of Berry's view that "Land that is in human use must be lovingly used; it requires intimate knowledge, attention, and care" (2009, p. 33). During their weeks of farm work, students read a brief history of agriculture, study food (in)justice and its relationships to poverty and environmental (in)justice, visit urban gardens in a city that faces economic and environmental injustice, and read biographical essays about sustainable farmers. Over the course of the semester, students write: a fieldwork log describing their 8-10 hours working on local farms; a personal food and gardening autobiography; a research paper focused on justice/injustice and sustainability or lack thereof in the fruit industry; and a visionary paper based in their own major that depicts a desired change (new program, practice, or institution) relevant to agriculture, ecological health, human health, and/or social justice.

Data Collection

Student logs or journals provide opportunities for students to move beyond recitations of basic facts to critically evaluating, reflecting upon, and articulating what they assume, believe, value, and experience in relation to topics of study (Dyment and O'Connell, 2011). While student logs or journals are widely used in higher education to invite learning, they may not effectively stimulate students' rich thinking if educators forego focused approaches, such as clear expectations regarding purpose, links to course concepts, feedback, and guides to formulating and articulating rich reflective thinking, which we provide verbally and in a fieldwork log template (Dyment and O'Connell, 2011). After each fieldwork session, students describe tasks they completed; explain what they learned; identify, analyze, and synthesize insights they gained in relation to environmentally conscious and justice-oriented farming and its associated benefits; and evaluate how their learning on a given day heightened their understanding of course readings (see appendix). Prompts are open-ended to encourage students to generate their own wording and concepts and identify course topics, authors, and experiences that were meaningful to them. Students wrote entries during the first half of the semester, and at mid-semester, reflected on and edited their entries to compose a coherent 3-6 page analysis of fieldwork.

Analysis and Interpretation of Data

Finding that students' fieldwork logs contained numerous references to the acts of caring and experiences of connection on farms where they worked, we evaluated their language concerning care and connection. In total, 29 categories emerged; we then confirmed the prominence of students' statements relevant to the categories of intimate connection, active care, and regeneration and selected quotes representing each theme.

In our 38 student fieldwork logs, 16 students use the word 'connection,' 13 use 'relationship,' and three use 'interaction,' most of them using these words repeatedly. Six use the word 'intimacy' in describing connections and relationships and 10 use the word 'love.' Fifteen use the words 'care' or 'caring.' Three discuss the concept of 'harmony.' One student made direct statements about regeneration and others made related statements about, for example, composting so that "nutrients can help other more productive plants to grow." A large majority of the 38 students used specific and similar words relating to intimate, caring, or loving connections or relationships. All 38 students referred to connections and relationships, even the few (approximately five) who did not explicitly use the words listed above. Terms or concepts students used that are not accounted for in our key categories may be the focus of future studies; these include how the farms students worked on address food (in)justice and human health; 'health;' 'balance;' and 'sustainability.'

Findings

Students' fieldwork logs conveyed general agreement as well as variation about the significance of fieldwork. Three key themes emerged that captured prevalent responses, which formed an integrated theoretical model indicating the interrelatedness of students' experiences of active care, intimate connection, and regeneration (see Figure 1). Within each of these main themes, sub-themes surfaced with further variations in each. Active care encompasses students' actions of caring for plants, people, and animals. Intimate connection consists of students' feelings of kinship with people, plants and land, networks of farms and farmers, and farmers' love of farms and farming. Regeneration conveys perspectives and practices dedicated to ensuring that future generations, both human and other-than-human, flourish in a thriving natural world. In the following sections, students' own reflective statements indicate a rich array of loving, relational responses they felt and enacted.

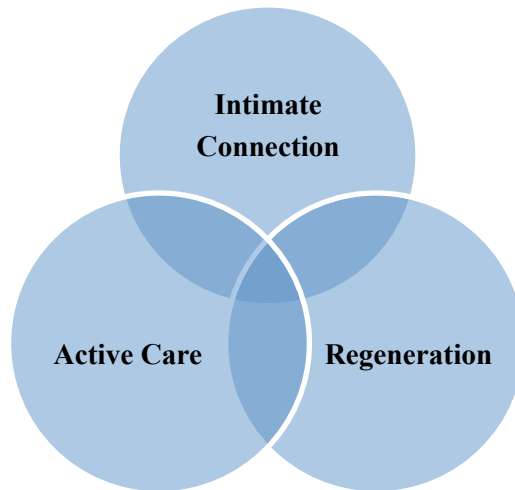


Figure 1: Integration of active care, intimate connection, and regeneration represents student response to fieldwork.

Active Care

Students wrote amply about the experience of providing care during their fieldwork, highly attentive to situations that allowed them to serve in a caring, helping role. Fifteen students specifically used the words ‘care’ or ‘caring,’ often multiple times, while five used the word ‘tending’ and others used words such as ‘helping.’ We offer the term ‘active care’ to encapsulate students’ comments, and define it as the work students physically performed to promote the well-being of plants, animals, land and people during their fieldwork. Students’ farm tasks included planting, weeding, composting, mulching, harvesting, readying produce for sale, building farm structures, and interacting with farm animals.

Pleasure in Helping Plants

Students wrote about taking pleasure in helping plants to grow. We are aware from conversations with students that roughly ten of the 38 had limited home gardening experience, but a majority reported little to no previous contact with any type of agriculture. Although the fieldwork log assignment does not specifically request that students report on their feelings about the farm work, and some students wrote with some frustration about the tiring or dull aspects of weeding, more comments reflect feelings of pleasure related to the helping aspect of the work. Caroline wrote: “it was satisfying removing [the weeds] from the space used by the arugula.” Eiman noted: “I felt like we were helping the blueberry bushes [to] flourish, as corny as that sounds.” Thinking in more scientific terms about the effects of her weeding around a blueberry bush, Elaine, an Environmental Science major, commented: “I saw how the space I gave it to grow would allow for more sunlight, nutrient availability, and potential to grow.” Writing that she felt “disheartened by the heavy weeding work she did, Giulia was

simultaneously aware that she and her classmates were tending plants that would become food for people: “We helped for greater growth of the Swiss Chard that would go on to feed many families.” The fieldwork logs consistently display pleased surprise regarding the satisfaction students felt while caring for plants.

Organic Farming and Human Well-being

Students wrote frequently about the connections they observed between small organic farms and the well-being of local human communities, displaying a relational ethic. Kristina, an Environmental Science major, described her assessment of how the community farm engages in “care for one’s neighbors” through the provision of healthy food. Referring to the urban gardens he visited in low-income neighborhoods in New Jersey and Philadelphia, Christian, a senior Biochemistry major, wrote: “both places took what was deemed by many to be a desolate place of sorrow (...this neighborhood near a sewage plant in Camden and these lots which can’t be built on because of the dangerous sewage pipe below) and turned it into a beautiful place for growth. Not only do both of these places promote the physical growth of plants, but they also promote community growth.” Students also were intrigued by seeing families with young children visit one of the farms. This seemed to broaden their awareness of the many forms of ‘active care’ for land and people: several wrote about how these parents were introducing their children to a nurturing and connected relationship with land and food. Jacob, a senior Accounting major, wrote: “Seeing young parents take their children to the farm early on a Saturday morning to pick crops . . . touched my heart in a way I do not believe I understand yet.” Students repeatedly commented in writing and verbally in the classroom that fieldwork experiences allowed them to more deeply comprehend course readings’ ideas regarding the intricate network of relationships among agriculture and the health of people and communities.

Active Care for Animals

Students showed interest in their encounters with wild animals during farm work and displayed life-centered values and compassion in writing about them. A group of students working together discovered mice nesting around blueberry bushes and all later wrote about how the mice’s delicate needs are compatible with the gentle handwork of small-scale agriculture, but not with mechanized agriculture. Bradley explained: “when we were hoeing we came across an area where a bunch of mice lived and were nervous we were going to hit one with a hoe, which made me glad that we could work with such care as opposed to barreling through with a tractor.” Olivia wrote in reference to a rabbit she nearly stepped on, “If we had been using a giant tractor, we never would have seen the wild bunny.” As they did in their comments about the relationship between sustainable agriculture and human well-being, many students were interested in extending systematic thinking to the well-being of wild creatures on the farms. Ned struggled with his farmer’s directive to scissor in half the caterpillars that were infesting rows of collards, writing: “It almost seemed as though I was messing with the natural system of things by killing these caterpillars, however. That is a caterpillar’s way of life, after all. Who am I to disturb or end that?” Students’ consideration of such questions suggests how farm work enhanced their sensitivity to the well-being of other-than-human life forms.

Intimate Connection

To capture students' affective responses, we use the term 'intimate connection.' The number of students who wrote about feelings categorized within intimate connection may reflect their religious and service commitments. Many of the 38 are practicing Catholics, and many have been substantially involved in the University's service projects--ranging from Habitat for Humanity construction work to a 6:00 AM running club with homeless people--which offer opportunities to reflect on caring behavior, compassion, relationship, and community. Additionally, our reading of Wendell Berry's agrarian essays introduced students to Berry's vocabulary about farming as intimate. Moreover, roughly 18 of the 38 students had read Thomas Berry's writings in previous courses. Notable is how many students adopted Wendell Berry's and Thomas Berry's vocabulary of intimacy with no explicit encouragement to do so from either the course instructors or farm work mentors. At times students referred directly to Wendell Berry's influence on their perceptions. As Eiman wrote: Berry "finds farming an intimate, personal experience, and that is evident at Linden Acres." Others, such as Kevin and Jacob, used the words 'intimate' or 'intimacy' without referring directly to our Wendell Berry readings. The fieldwork log requested that students reflect on two course readings in relation to each site visit; students referred to Wendell Berry's essays more than any other course reading.

An interesting aspect of students' comments regarding connection is the extent to which they identified with the farms and the farms' produce, although most visited each farm a maximum of four times. Even though the students consumed only tastes of the food grown on these farms, some referred to the farms' produce as 'my food,' indicating a strong sense of affiliation with the organic produce they briefly helped to cultivate. Raffaella wrote, "It was nice to get a feel for what the foods I love go through. For me, an emotional bond was reached by knowing that my food is cared for, with love, care, and devotion."

Intimate Connection to People

Numerous students commented on the human connections they experienced during fieldwork with peers, farmers, and community members, describing "the sense of community and friendship on the farm" and the "easy flow of conversations" that occurred during tasks such as weeding. Caroline noticed "how simple it was to hold a conversation with someone while working with the earth in front of us." Anna stated, even after expressing that she felt abandoned when the supervising farmer left them for three hours of weeding a blueberry patch without spending time conversing with them about the farm, "I did find a special comfort and pleasure in sharing the experiences with the others in the group... Working together in the dirt is a unique bonding experience, and I felt really energized and refreshed for the rest of my day." Students particularly commented on their pleasure in getting to talk at length with farmers, writing, for example: "I remember this day so fondly because of the interaction we were able to have with G., an 'in-the-flesh' sustainable farmer." Several others commented on their enjoyment in unexpectedly working with special-needs high school students who were at the farm on the same day, with Marie writing, "As I observed our collaborative effort collecting these [tomato] stakes that scattered the field I began to realize how we were all moving as one continuous unit, a unit that could not be differentiated by our potential capabilities." Pleased statements about the experience of human connection appear with a high frequency in the fieldwork logs, evincing

students' enjoyment of interacting with friends, classmates, farmers, and other volunteers while completing the slow tasks of farming.

Intimate Connection to Plants and Land

Students wrote in detail about their experience of intimate connection with plants and land, especially showing interest in their impressions of the systemic connections occurring on sustainable farms. Christian commented: "What I had firmly cemented in my mind after my three weeks at Cobb's Mill Farm is that the farmers and the volunteers there *see* everything which grows on their farm. . . . Each individual plant is recognized for the life it contains within it and its ability to share this life with people through the nutrients it contains." Jacob noted, "Cobb's Mill has such few crops that it allows the farm workers to know them so intimately. The head farmer, M., knew the health and output of every single thing living on the grounds!" Eiman and Kristina wrote, using almost identical language to each other: "I realized how connected to the Earth farmers—especially organic farmers—are...I learned a lot about how intimate farming is."

For some, the experience of intimacy felt personal. Teresa wrote, "I enjoyed being so close to the Earth." Elaine, a senior Environmental Science major like Teresa, explained, "Personally pulling the weeds out of the ground to be sure that the plant was cared for gave me that more personal connection with the land and the product that will ultimately be produced. To use chemical treatments [and] intrusive technologies would seem like a violation of the land by comparison." Owen, a senior English major, wrote, "there is something cathartic about having your hands completely covered/buried in healthy, rich soil. I was absolutely filthy when I left, but I wore that as a badge of honor, and was happy that I was able to have so much personal contact with the soil that we have been learning so much about in terms of health." Repeatedly students indicated their value for what Thomas Berry has termed 'intimacy in human-Earth relations.'

Students observed how they and farmers carried out their work with their hands touching the land and plants. After working at Haytop Farm, Lara wrote about how the farmers "had such a close communion with the farm because they were using their own bodies and labor much more than they were using machines or chemicals." Students repeatedly described farmers' work using words such as care, passion, tenderness, and attention. Jacob commented, "I am beginning to understand better what [Wendell] Berry means when he stresses the benefits of a farmer tending to his land personally rather than being separated by machinery." Students were interested not only in their own brief experiences of intimacy with land and plants, but in observing farmers' more developed intimacy.

Intimate Connection as a Network

Some students recognized organic farms and farmers as central points for a network of intimacy that includes multiple life forms and ecosystems and their diverse needs. Victoria wrote, "Not only do these farmers have relationships with the plants and fields as they take the time to physically go and nurture them, but they create amazingly close relationships with the many people they encounter between all of the outreach activity, volunteers, and workers." Christian elaborated:

Today's farm work made me almost instantaneously think back to [Wendell] Berry's quote, 'we can no longer pretend that agriculture is a sort of economic machine with interchangeable parts...we are farming in the world, in a webwork of dependences and influences more intricate than we will ever understand.' This ... was perfectly demonstrated in the bees [hives] and in the roof garden we found at Cobb's Mill Farm. M. is in so many ways what a farmer should be: he knows about the little ways in which the crops on the farm play off of one another, and he is always looking to learn more about these interconnections.

Some students recognized networks of intimacy as they wrote about connections between empathic care for land and plants, and empathic care for the larger natural world and the humans who depend on it. Kevin wrote: "Cobb's Mill Farm demonstrates the hope that lies within organic farming and actually understanding and caring for our food and land, which in turn means caring for our world and ourselves." Paige stated, "How we treat our soil reflects what we think of the soil, and thereby how we think of the world on which we survive.... We need to develop a right relationship with the earth, and that can begin with such simple an action as tending for the soil from which we grow the food we eat." Many students who wrote about connections relevant to people, plants, and land deepened their awareness of connection and recognized the intricate networks through which connection flourishes.

Intimate Connection as Love

Several students assessed their farm experiences by describing organic farmers' work as loving. Eiman wrote of how the food on the organic farm "is grown with patience and love," Hope asserted that "love is necessary to sustainability," and Frances stated, quoting Wendell Berry: "I do believe that both H. [farmer in a book] and M. [farmer at site] use the land lovingly and that it 'requires intimate knowledge, attention and care.'" Victoria reflected: "I came to see head-on why these people needed to have a passion for this organic farming vocation If you do not love it, believe in all the benefits it can bring, and truly care about the nature of the plants and the animals, you will feel the tiresome weight of the work on your back... and the option of, for example, artificial methods of weeding would become more and more enticing." This extension into the concept of love suggests students' deepening awareness of relationality and the complex ways it interweaves human values and emotions with care for land and natural systems.

Regeneration

Students' statements about the integrated aspects and long-term implications of sustainable agriculture reveal how they conceptualized regeneration. In an agricultural context, regenerative work may be as simple as saving seeds, planting perennial vegetables and flowers, planting flowering plants that nourish pollinators, or beginning a community garden; it may be as complex as implementing permaculture systems or biodynamic practices, or integrating a community garden with a K-12 school curriculum. Regeneration is conceptually challenging to the modern mind because it requires renewed awareness of the intricate connections among humans, within the natural world, and between humans and the natural world--connections that often have been ignored, devalued, or damaged by industrialized cultures. Students nonetheless displayed substantial interest in welcoming regenerative concepts and practices into their awareness.

Students responded with alacrity to course materials' teachings about regenerative ideas, whether encountered in a United Nations document urging a need "for a holistic understanding" of agriculture (United Nations, 2013, "Key Messages"), or in White's article about Detroit's African-American D-Town Farm and its impacts on the health of communities, natural environments, and people (White, 2011). Although most struggled to understand the broad reach of permaculture in a course where we can give only limited time to each topic, they were intrigued by permaculture principles such as "observe and interact," "use and value renewable resources and services," "produce no waste," and "integrate rather than segregate," all of which may be said to be components of regenerative practice (Holmgren, 2002). One student, Christian, explicitly used the term 'regenerative' by referencing a permaculture video:

[Toby] Hemenway defines sustainability as 'the midpoint between degenerative actions and regenerative activities.' This concept works in perfectly with my work today with the compost. . . . Cobb's Mill Farm collects all of the weeds and unusable produce into the compost piles and allows it to become useful again as fertilizer. Farming is inherently a degenerative action, as it takes nutrients away from the soil. However, Cobb's Mill has found how to be sustainable, found how to achieve the midpoint between degenerative and regenerative in their use of waste as compost. The fertilizer gained from this compost is completely regenerative in nature, and even better, comes free to the farm.

Demonstrating awareness of the systems-oriented nature of regenerative agriculture, Christian emphasized the in-situ closed loop of cycling nutrients from plant growth, to composting, to plant growth that he witnessed at Cobb's Mill, and the balance it represented.

Other students' attention also was captured by what we term regeneration, although they did not explicitly use the term. Marianna wrote after working at Linden Acres: "Visiting the compost pile [it] was oddly striking for me . . . how composting can tie into reverence for life. Even though weeds and old crops are not desirable, they can still be respected and utilized as their nutrients can help other more productive plants to grow." Thinking toward the interconnected renewal achieved through regeneration, Keven noted: "We need to almost turn around and take a step forward, but returning to a more intimate relationship with our land. . . . Haytop demonstrates the hope that lies within organic farming and actually understanding and caring for our food and land, which in turn means caring for our world and ourselves."

Discussion

Recognizing that many contemporary college students have had few experiences with the natural world that could ground them in the knowledge, skills, and resilience required to address environmental challenges for the long term, and that too few college policies, educational models, aims, and practices offer sustainable education, we explored how college students respond to course fieldwork that embeds experiential sustainability education. As students engaged in the work of active care through planting, tending, and harvesting gardens, they experienced feelings of intimate connection and love that inspired their desire to participate in regeneration for long-term benefits to humans, other-than-humans, and the natural world. This study's findings regarding participants' responses of caring and connection to the natural world and others during sustainability-related fieldwork reflect those of other studies (Alagona and Simon, 2010; D'Amato and Krasny, 2011; Shephard, 2008).

While fieldwork logs provide insight into students' understandings, frustrations, satisfactions, and puzzlements about urban and suburban agriculture as a possible arena in which to confront environmental degradation, food injustices, and health problems, we acknowledge the limitations of this study by noting here questions that could be pursued in future studies. First, how did students' spiritual or religious backgrounds and previous service-learning experiences influence their perspectives? (More than half of the 39 were practicing Catholics who were involved outside of the course in service work in low-income rural and urban areas of the United States and Central America). Second, how did previous coursework, including in their majors, influence students' perspectives? Third, how do students' ethnicity and socio-economic class impact their responses to fieldwork?

The distinctiveness of this study lies in the understandings students conveyed about the concept of regeneration, a centuries-old worldview associated with, but not limited to, indigenous peoples' commitment to restorative efforts on behalf of future generations that guide decision-making (Berry, T, 1999; W. Berry, 2009; Cajete, 1999; Lyons, 2008; Mohawk, 2008). Habituating students to regenerative perspectives and practices has the potential to stimulate their long-term as well as short-term action. Students' participation in community sustainability initiatives may endow them with memories of individual and collective flourishing that can be called upon if they encounter climate-change-related jolts or disasters; students may be able to respond to challenges with resistance (withstanding disruptions) and resilience (the capacity to bounce back) (Adger, 2003; Tidball, et.al, 2010). In other words, students' accumulation of positive attitudes, values, knowledge, and skills through engagement in collaborative community greening may enable them now or in the future to act cohesively and wisely amidst environmental upheavals. Affirmation of students' commitment has appeared, as noted above, in the decisions of at least 11 of the 39 students whose work we studied to spend their first year after college working or volunteering in jobs related to sustainable agriculture.

Involving students in this capacity-building may be among the most essential aims of today's educational institutions. Unity College in Maine has modeled this by re-envisioning itself as a thriving sustainability center. Practices include curricular integration of ecological and human health and a new sustainable agriculture program; sustainable landscape design featuring food gardens; and partnering with the community as students grow, harvest, and sell organic food on- and off-campus (Tomashow, 2014). To expand beyond Unity's inspiring model, however, colleges may need to imitate community-based initiatives outside conventional higher education settings, such as the Transition Towns movement, which originated in Totnes, Devon, UK, and has spread globally (Hopkins, 2011). In Transition Towns, citizens map community assets and vulnerabilities; then envision how to withstand shocks related to climate change; adapt social and ecological systems; rebuild social, political, economic, and environmental policies and practices; and transition to renewable energy.

Does the urgency of environmental degradation demand curricular change focused on a model as comprehensive as Transition? Given our students' appreciation for opportunities to experience sustainable agriculture and its capacities to support human, community, and environmental health, and their enthusiastic responses when we present the Transition movement as a model for sustainable community action, we surmise that college students desire and are ready for more timely and expansive education than most institutions currently provide.

Conclusion

As we consider the larger significance of students' responses to experiencing active care in an agricultural context, we recall the words of Thomas Berry: "For the first time since the industrial age began we have a profound critique of its devastation, a certain withdrawal in dismay at what is happening, along with an enticing view of the possibilities before us . . . A younger generation is growing up with greater awareness of the need for a mutually enhancing mode of human presence to the Earth" (1999, p. 200). As educators, we must not only inform students of devastation and accompany them in their dismay, but also cultivate their visionary images of a thriving planetary future. Let those images guide our revisioning of the educational endeavor so it may awaken "a new reverence for life, the firm resolve to achieve sustainability, the quickening of the struggle for justice and peace, and the joyful celebration of life" (The Earth Charter, 2001).

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Appendix

Fieldwork Log	
<i>Student Name:</i>	<i>Name of Fieldwork Site:</i>
<i>Fieldwork Date:</i>	<i>Address:</i>
<i>Number of participation hours today:</i>	<i>Site phone number:</i>
Describe your tasks today:	
What did you learn? Think about intellectual, aesthetic, physical, and moral aspects of your learning.	
What insights did you gain about environmentally-conscious farming? Who benefits, how, and why? How does your learning today at the fieldwork site help you to understand, critique, or question two of our course readings? Discuss relevant ideas from course readings.	

