

Interacting Pedagogies: A Review and Framework for Sustainability Education

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Abstract: Although the Decade of Education for Sustainable Development (2005–2014) was a period of rapid pedagogical revitalization and innovation, much sustainability education today is still delivered using transmissive and instrumental pedagogies common across higher education. Now that the field has integrated many of the insights from the decade, students and facilitators should continue innovating along themes consistent with the goals of sustainability: transformation and emancipation. Yet, more clarity is needed about pedagogical approaches that will transform and emancipate students, allowing them to become innovators that change existing structures and systems. This paper presents a framework of interacting pedagogies in sustainability education, helping to reify pedagogical concepts, rebel against outdated curricula, and orient facilitators/learners on their journey toward transformative and emancipatory learning. The authors begin by briefly reviewing the evolution of sustainability education and transformative learning theory prior to introducing the framework. The paper concludes with a vision of sustainability education that incorporates contemplative pedagogies as essential methods in a field in need of cultivating hope, resilience, and emergence.

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Institutions of higher education (IHEs), are expected to play a pivotal role in a global shift toward sustainability. IHEs provide a social container where norms and behaviors consistent with ecological and social well-being can develop. Accordingly, most IHEs today actively promote forms of *non-formal* sustainability education on their campuses (e.g., recycling, food waste, and transportation programs). Assuming students learn and maintain these behaviors after graduation, such initiatives may promote sustainability beyond the spatial and cultural boundaries of the institution.

IHEs have also begun to develop *formal* sustainability curricula, inspiring some scholars to envision what an exceptional sustainability education might look like. Although consensus is lacking in the literature, many agree that *emancipatory* and *transformative* learning are essential components that sustainability education requires to be effective (Moore, 2005; Sipos, Battisti, & Grimm, 2006; Sterling, 2011; Wals, 2012; Summerfield & Wells, 2017). Emancipatory learning challenges power structures (both inside and outside the classroom) through a praxis of dialogue and action (Freire, 2007). It promotes change by seeking to transgress boundaries of race, sex, and class through pedagogies of participation and shared meaning-making (hooks, 2014). Transformative learning, through similar experiential pedagogies, sparks personal and ethical engagement (Eaton, Hughes, & MacGregor, 2016), encouraging students to ponder their meaning-making processes during and beyond the college experience. Transformative learning is also holistic, involving intellectual, embodied, emotional, and intuitive faculties of knowing (Sipos et al., 2006), and implies reflexivity and inquiry into students' own ideas, values, and beliefs about themselves and the world (Kitchenham, 2008).

A problem today is that much sustainability education conforms with *transmissive* or *instrumental* learning approaches that are the default across a wide-range of disciplines (Sterling, 2001; Burns, 2015; Jickling, 2017; Stains et al., 2018). Transmissive learning assumes that society already possesses the knowledge required to address sustainability challenges, and teachers just need to “transmit” it to students; meanwhile, the knowledge itself, as well as learners' ways of being in the world typically remain unexamined. Instrumental learning, on the other hand, regards education as “a means to an end” (Nolet, 2016, p. 87). Thus, in the case of most Western IHEs, students go to college to get a job (Sterling, 2017). Yet, without knowing which types of jobs will exist in 20-30 years, much vocational training provided by IHEs today is likely to become irrelevant. Further, instrumental approaches tend to leave power structures and/or boundaries associated with race, sex, or class intact. The authors suggest that sustainability challenges cannot be addressed either by knowledge accumulation or vocational training; rather, they require engagement with power structures and social boundaries and a fostering of new ways of experiencing the world altogether. As such, we regard both transmissive and instrumental learning in sustainability education as *foundational* – a prerequisite to “higher order” (Wals & Jickling, 2002; Sterling, 2011, pp. 22-26) interactions of transformative and emancipatory pedagogies.

Many challenges facing civilization today require that both students and facilitators of sustainability education rebel, humbly but courageously, to transform their roles and be willing to be themselves transformed (Blenkinsop & Morse, 2017). The goal for this paper is to provide a framework of pedagogies for those willing to take up this challenge, helping to orient themselves, articulate their intent, plan appropriately, and advance teaching methods in

sustainability education. In beginning a journey, it is helpful to know where you have already been. Therefore, the authors begin by briefly reviewing the evolution of sustainability education, attempting to explain the current state within a broad historical context. Transformative learning theory is then also briefly reviewed to clarify the frequently contested concepts of transformation and emancipation. The framework for interacting sustainability pedagogies is then introduced and discussed. Finally, we draw upon years of research in the contemplative sciences to propose a future vision of sustainability education that integrates contemplative pedagogies, which may be essential to the arduous task of transformative and emancipatory learning.

The Emergence of Sustainability Education

Recognizing IHEs as potential intervention points in humanity's response to urgent sustainability challenges, sustainability education emerged in "waves" during the 20th century (Wals & Blewitt, 2010). The first wave coincided with initial descriptions of "wicked problems" in the late 1960s and was contemporaneous with a literary movement aimed at publicizing the potential for environmental disasters. Works such as *Silent Spring* (Carson, 1962) primed the culture for a new type of education. It was referred to generally as "environmental education," and early attempts to describe its scope and purpose appeared during the first Intergovernmental Conference on Environmental Education (UNESCO, 1977).

Accordingly, the late 20th century saw an increase in the number of IHE program titles that included the word 'environment.' Environmental studies, environmental engineering, and environmental law programs were but a few examples of attempts to adapt to a growing number of complex, urgent, and socially-coupled environmental dilemmas. Later, the field began to integrate notions of development, social justice, and economics as inter-related, or coupled with, most modern environmental degradation issues. A 1992 UN conference highlighted the need for converging environmental education and development and declared "Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues" (UN-RIO, 1992, para. 36.3). With development as a new focus, scholars began to call for reforming environmental education, and 'environmental education for sustainability' (EEfS) emerged. While similar to environmental education, EEfS claimed the following key components: relevance, holism, values, action, and political literacy (Tilbury, 1995). Thus, EEfS was evolving with the recognition that sustainability challenges were socially-coupled, transdisciplinary, normative, and urgent. Nevertheless, while the inclusion of the words 'environmental' and 'sustainability' in IHE programs helped to legitimize an evolving discipline, it did little during that time to alter pedagogies which continued to conform with transmissive and instrumental approaches standard across most other disciplines.

While the first wave of sustainability in IHEs was about implementing environmental education (and the related EEfS) in response to environmental and developmental concerns, the second wave would address the complicity of IHEs in sustainability dilemmas and is often referred to as the "campus greening" movement (Wals & Blewitt, 2010). This wave focused less on pedagogy, and more on IHEs' efforts to reduce their ecological impacts. Efforts to sustainably manage institutional footprints took predictable pathways. Small-scale efforts included the implementation of waste efficiency (e.g., composting, recycling), and energy efficiency (e.g., low-energy lighting) practices. Large-scale efforts included campus conversions to renewable sources of energy like solar and biogas. To date, many schools have made headway towards reducing their ecological footprints (see the 2017 Sustainable Campus Index for examples,

AASHE, 2017). However, the efforts of this wave were arguably more about addressing the responsibility of IHEs, and less about evolving pedagogy.

Despite the development of the first and second waves of sustainability education, many indicators of global sustainability continued to decline during the 2000s (Rockström et al., 2009). Some academic institutions further adapted during that time by developing either ‘add-on’ or integrated sustainability programs and began to experiment more with emancipatory and transformative pedagogies, proposing visions for curricula that would not only describe sustainability challenges, but also question inherent power dynamics and engage students in experiential solutions endeavors (Brundiers, Wiek, & Redman, 2010; Brundiers & Wiek, 2011). These were perhaps important stepping stones toward the current third wave of sustainability education aimed at “learning that helps people transcend the ‘given,’ the ‘ordinary,’ and often the ‘routine ways of doing,’ to create a new dynamic and alternative ways of seeing and doing” (Wals & Blewitt, 2010, p. 66).

The emergence of the Decade of Education for Sustainable Development (DESD, 2005–2014) during the third wave also helped educators reflect on what types of learning were appropriate for sustainability (UNESCO, 2005). During this period, many instructors began reviving previously underutilized pedagogies, or innovating new ones, and approaches such as collaborative, community-based, and service learning became more common (Wals, 2012). Other third wave efforts focused on innovative teacher training. One notable case is the General Teaching Council for Scotland’s revised teacher standards for sustainability. The new standards include, as just one example, that “each practitioner, school and education leader should demonstrate learning for sustainability through their practice” (UNESCO, 2018, p. 150). Thus, the third wave of research, policy, and practice helped to evolve sustainability education significantly.

Yet, if our record of solving sustainability challenges is a proper gauge of the sum effort of sustainability education, there is scant reason to cheer. Most attempts to solve urgent, large-scale sustainability challenges have failed (van der Leeuw et al., 2012). Trends in global biodiversity, deforestation, eutrophication, and CO₂ emissions continue along undesirable trajectories (Rockström et al., 2009), with many accelerating in unsustainable directions (Steffen et al., 2015). These and other indicators of decline have caused some scholars to ask, “what sustainability problems have we solved over the last decade?” (cited in van der Leeuw et al. 2012, p. 117), while others have called for the end of the sustainability endeavor altogether (Benson, & Craig, 2014). In the following section, we investigate several strands of transformative learning theory to justify a reinvigoration of the third wave of sustainability in higher education. This exploration is also a prerequisite for the introduction of a framework intended to provide clarity and direction for pedagogical practice and innovation in sustainability education. We propose that the answer to the question “is higher education ready” is indeed – *ready or not, here we come.*

Transformative Learning Theory and Sustainability Education

When it comes to helping learners transcend the ‘given,’ the ‘ordinary,’ and the ‘routine,’ transformative learning theory is highly relevant. Incorporating a wide diversity of perspectives, transformative learning theory has been described as rational or extra-rational, autonomous or relational, emotional or intuitive, and individual or collective (Cranton & Taylor, 2012). While this diversity has led some to criticize transformative learning as nebulous, boundary-less, or

metaphoric (Howie & Bagnall, 2013), there have also been concerted efforts to unify transformative learning theory under a single umbrella (Dirkx, 1998; Taylor, 1998; Cranton & Taylor, 2012). Today, transformative learning theory is codified into four dominant strands: the *emancipatory*, the *critical-reflexive*, the *developmental*, and the *extra-rational* (Dirkx, 1998).

Freire's Emancipatory Learning

Transformative learning theory in its *emancipatory* strand arose from the work of Paulo Freire (2007). By working at educating the poor in Brazil, Freire developed a theory of transformative learning he called *conscientization*, referring to consciousness-raising through critical reflection. The goal of this learning was not the transformation of the learner per se, but the transformation of social systems through the learner's emancipation, political liberation, and freedom from oppression (Dirkx, 1998). With the education that Freire proposes, "the oppressed unveil the world of oppression and through the praxis commit themselves to its transformation" (Freire, 2007, p. 54). Eventually, "it is the oppressed who, by freeing themselves, can free their oppressors. The latter, as an oppressive class, can free neither others nor themselves ... the contradiction will be resolved by the appearance of the new man: neither oppressor nor oppressed, but man in the process of liberation" (Freire, 2007, p. 56).

Freire's learning theory is founded on three premises. The first is the rejection of a "banking" approach to education (2007, p. 72). Here, he refers to the instrumental and transmissive modes of education mentioned earlier. Freire instead articulates a liberating education utilizing acts of cognition. The second premise describes the need to move between reflection and action, as education without action is insufficient at reorganizing power structures. The third premise is that of student-teacher power leveling. Freire proposes students and teachers must be on equal footing, and their dialogue one of "love, humility, and faith, of which mutual trust between the dialoguers is the logical consequence" (Freire, 2007, p. 91).

The ideas of conscientization, a reflection-action dyad, and levelling of classroom power are ideally-suited to emancipatory education for sustainability, where freedom from oppression, action-orientation, and egalitarianism are crucial themes. Sustainability challenges are often situated within power contests arising from multiple representations by stakeholders; thus, they require awareness of, and action within, uncomfortable power dynamics. Avoidance of these contested perspectives makes addressing sustainability challenges impossible. Levelling of the student-teacher relationship transfers power to students, allowing them to self-direct their inquiry, and create discourse *as* learning, as opposed to discourse *in* learning. Education that addresses power, liberates learners, and leads to action is needed in sustainability education more than ever. Here, Freire's emancipatory approaches can play a central role.

Mezirow's Critical Reflexivity

The critical-reflexive strand of transformative learning theory arose in the late 1970s, when Jack Mezirow used the word transformative in his study of women returning to higher education or the workplace after an extended absence (Mezirow, 1978). He was attempting to address the needs of women returning to school or work through a qualitative study aimed at assessing factors that would impede or facilitate their success. The study was conducted at 12 learning institutions across North America and involved 83 subjects. After the study, Mezirow concluded that many women who had re-entered learning institutions had undergone a personal transformation.

The early work of Mezirow was influenced by three scholars: Thomas Kuhn, Paulo Freire, and Jurgen Habermas. Kuhn's (1963) idea of revolutionary and evolving scientific paradigms was particularly important, helping to form Mezirow's concepts of *meaning schemes*, *meaning perspectives*, and their transformations. Meaning schemes are made up of "knowledge, beliefs, value judgements, and feelings that constitute interpretations of experience" (Taylor, 1998, p. 6). A meaning perspective is a "general frame of reference, worldview, or personal paradigm made up of a collection of meaning schemes" (Taylor, 1998, p. 6). When novel experiences happen to an individual, and they cannot be integrated into an active meaning perspective, the individual must either reject the experience, or undergo a perspective transformation. This perspective transformation is at the heart of Mezirow's strand of transformative learning theory.

Mezirow's approach to transformative learning aims to transform the *individual*, distinguishing it from Freire's *collaborative* approach. It is the learner's experiences, which are socially-constructed in the classroom that provide content for reflection. These experiences arise when learners engage reflexively in ways that promote (1) adding to and revising meaning schemes, (2) acquiring new compatible meaning schemes, and (3) meaning transformation that results when anomalous information cannot be resolved (Kitchenham, 2008). According to Mezirow, once a transformation occurs, it is impossible to regress to levels of less understanding, and the person who has been transformed is likely to alter their behavior. Approaches which allow one to alter their worldviews and behavior are considered by many scholars to be essential to sustainability education.

Developmental and Extra-Rational Transformative Learning

The last two strands of transformative learning theory are the developmental and the extra-rational. The developmental strand was championed by Larry Daloz (2015) and differs significantly from Freire and Mezirow in that transformation depends less on reflexivity and rationality, and more on holism and intuition (Dirkx, 1998). For Daloz, the transformative process is focused on personal change and self-actualization. Alternatively, the extra-rational strand, championed by the psychologist Robert Boyd, is focused on individuation. Boyd (2003) was heavily influenced by depth psychology, and the work of Carl Jung. As such, his idea of transformation is concerned with the emotional and spiritual dimensions of learning, and their integration into daily experiences (Dirkx, 1998). According to Boyd, learners are transformed by becoming aware of aspects of themselves that they are not fully conscious of. While the strands of transformative learning theory that Daloz and Boyd propose make up a smaller portion of the historical theory and research, they are important to a unified theory of transformative learning continuing to emerge (Cranton & Taylor, 2012). Further, they are essential to a portfolio of emancipatory and transformative pedagogies in sustainability education because they address a diversity of learning preferences, skills, and cultural backgrounds. They also go further in engaging the embodied, emotional, and intuitive dimensions of transformative learning, and thus represent a holistic education that must be present in learning for sustainability (Sterling, 2001; Papastamatis & Panitsides, 2014).

In summary, transformative learning theory is widely cited, applied in diverse contexts (e.g. O'Sullivan, Morrell, & O'Connor, 2002; Taylor & Cranton, 2012), and aims to change social structures as well as individuals. It claims to relieve oppression and power imbalances. It engages learners holistically, requiring embodied, emotional, and intuitive faculties of knowing.

Finally, it necessitates action, which help learners relieve the tension of newly acquired perspectives through engagement. Morell and O'Connor (2002) suggest that the theory supports: “a deep structural shift in the basic premises of thought, feelings, and actions. It is a shift of consciousness that dramatically and permanently alters our way of being in the world. Such a shift involves our understanding of ourselves and our self-location: our relationships with other humans and with the natural world” (p. xvii).

This is the kind of education sustainability scholars are calling for (e.g., Moore, 2005; Sipos et al., 2008; Sterling, 2011; Wals, 2012; O'Brian & Howard, 2016), an education of a different kind. As Wals summarized in his 2012 review, “as the DESD progresses, so does the realization that ESD needs to move beyond the transmissive to a transformative mode” (p. 23). Revitalizing an integration of transformative learning theory into sustainability education is crucial to achieving these goals.

The Interacting Pedagogy Framework

Many scholars have tried to reify the pedagogical lexicon of sustainability education. Sterling, for example, described both the “mechanistic” and the “ecological” paradigms, linking the mechanistic as transmissive and the ecological as transformative (2001, p. 59), and characterizing them both as instrumental approaches (one from the top-down, the other from the bottom-up). Wals, Geerling-Eijff, Hubeek, van der Kroon, and Vader (2008) have written about the need to choose between instrumental and emancipatory approaches wisely; however, they do not refer to transformation except to mention that “transformative learning disappears” when a project becomes more instrumental and less emancipatory (p. 62). Other scholars, noting the prevalence of prescriptive transformations, have identified the need for sustainability pedagogies that are both transformative *and* emancipatory, oriented toward capacities for disruption, resistance, and social agency (Lotz-Sisitka, Wals, Kronlid, & McGarry, 2015). They argue that the types of innovations required to bring about social change emerge in niches of collaborative, transdisciplinary agency.

Despite the occasional tendency to contradict, or conflate terms, we regard Western sustainability education as having two interacting pedagogical dimensions: the transmissive/transformative dimension and the instrumental/emancipatory dimension (Figure 1). Consequently, the possibility exists for sustainability pedagogies to be instrumental, but not transmissive—as well as transformative, but not emancipatory. While not intended to be a “catch-all” for every pedagogical approach practiced in sustainability education today, the framework *is* intended to (1) provide clarity regarding the different terms, (2) allow students and facilitators to plan appropriate curricula, and (3) provide a rebel’s compass that points toward transformative *and* emancipatory pedagogies.

Our framework also aims to illuminate the ways in which pedagogies for sustainability education interact. The dimension of instrumental/emancipatory pedagogies describes a movement from individuality, structure, and predetermined outcomes to collaboration, agency, and self-actualization respectively. Similarly, the dimension of transmissive/transformative pedagogies describes a movement from content-focused, objective learning resulting in knowledge and skills acquisition to process-focused, subjective learning resulting in novel ways of being and meaning-making. Understanding how these dimensions interact is also crucial to the articulation, planning, and delivery of sustainability classes in IHEs. As such, the framework is provided not to augment the already extensive literature on educational philosophy, but rather to

provide a map for facilitators and students who are striving to evolve the ways in which sustainability education happens in IHEs.

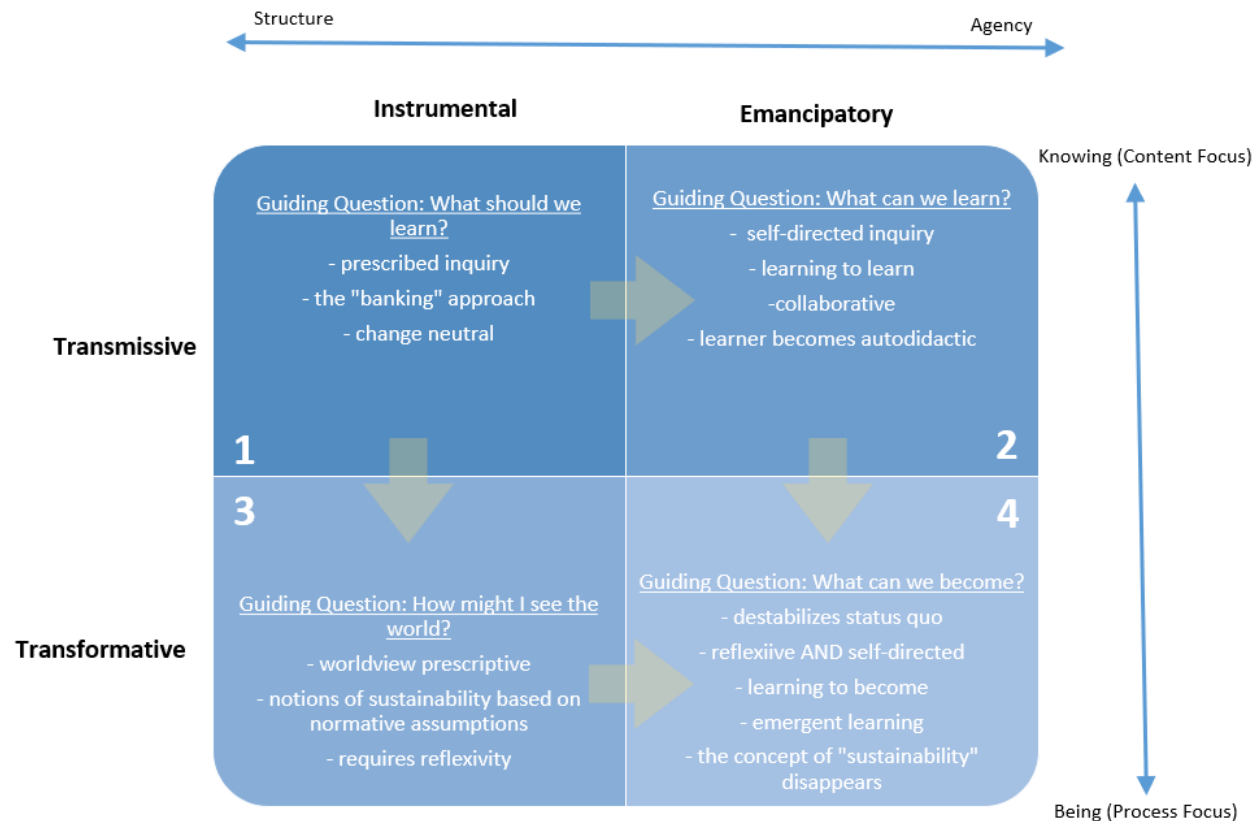


Figure 1. Authors' Interacting Pedagogy Framework.

Quadrant 1 of the framework describes the interaction of instrumental and transmissive pedagogies in sustainability education. This is the mode of learning described by Freire (2007) as the “banking” approach where the goal is to transmit knowledge or skills from the teacher (or content contained in texts, media, or other forms) to the student. Often used in the didactic instruction of STEM subjects, first-quadrant approaches focus on prescribed content (i.e., rote learning) with similarly prescribed outcomes and often have limited impact (Stains et al., 2018). Such approaches can be useful at times to provide background knowledge for later learning, however, even in those situations they can unintentionally favor learners predisposed to intellectual faculties of knowing (as opposed to embodied, emotional, and intuitive faculties). As such, we regard pedagogies consistent with quadrant 1 approaches to be ineffective in advancing sustainability education.

In quadrant 2 of the framework, content-based approaches take on a self-directed nature. Learners are no longer expected to acquire a specific body of knowledge prescribed by a knowledgeable other; instead, they can apply critical thinking and explore content at their own discretion. The interaction of transmissive and emancipatory pedagogies is often represented by problem-based approaches that encourage students to assume responsibility for their own learning via inquiry into real-world sustainability challenges. Although the idea of solving a problem may seem instrumental at first, it is the learner who is empowered via their exploration of the problem. Steinemann (2003), for example, describes problem-based learning as an

approach that “emphasizes learning by doing... They take ownership of the problem, and the problem-solving process” (p. 218). In our framework, the primary difference between first and second quadrant learning is that in quadrant 2 the learner has agency and can self-direct their inquiry. Accordingly, quadrant 2 is about learning to learn (and apply) on our own. Although critical thinking is important throughout the framework, quadrant 2 is particularly useful for refining the critical thinking and problem-solving skills recognized as fundamental to addressing sustainability challenges (Thomas, 2009; Nolet, 2016). The development of these skills is also beneficial in the movement toward transformative approaches requiring critical reflexivity (e.g., Mezirow’s strand of transformative learning theory).

The third quadrant of the framework is oriented around the guiding question “how might I see the world?” and is the interaction of instrumental and transformative pedagogies. The goal of learning in this quadrant is the transformation of learners’ worldviews, values, attitudes, and behaviors, extending beyond knowledge transmission into the affective, worldview, and social domains. For example, Nolet (2016) stresses the importance of the “big ideas” of sustainability and advocates for an education that fosters peace, collaboration, responsibility, respect for limits, and interconnectedness, among others (pp. 61-79). Similarly, Wiek, Withycombe, and Redman (2011) specifically lay out systems-thinking, normative, interpersonal, anticipatory, and strategic competencies as key to solving wicked problems in society. In this domain, instructors recognize a need to develop specific competencies, working toward sustainability solutions and aspiring to spark change in learners toward sustainability worldviews. Pedagogical tools in this quadrant are often labelled “experiential learning” and are designed not only to alter the way we think, but also our ways of being in the world. Like quadrant 1, this quadrant is characterized by its prescriptive nature; facilitators pre-determine which attitudes, values, and behaviors are needed to bring about the flourishing of human and non-human inhabitants of the planet. For example, courses or programs in this quadrant may elicit students’ sense of connection to nature, helping them care about, protect, and conserve endangered species. Or they may prescribe specific environmentally responsible behaviors such as energy conservation or recycling as important outcomes for learners. Because programs in this quadrant are instrumental, instructors report success when students have changed their values, demonstrated use of new competencies, or adopted new behaviors (e.g., Schoolman, Shriberg, Schwimmer, & Tysman, 2016; Felgendreher & Lofgren, 2018). Many initiatives documented during the third wave of sustainability education fall in this quadrant, representing a vast improvement over the quadrant 1 approaches typical of prior waves. However, learners in this quadrant are still situated in a hierarchy of worldviews; thus, critics of these approaches suggest they can be indoctrinating (Wals et al., 2008) or forms of behaviorism (Hyland, 1993). As Wals and Jickling (2002) claim:

“The process of seeking, rather than setting, standards for education for sustainability, from an emancipatory vantage point, above all means the creation of space. Space for alternative paths of development. Space for new ways of thinking, valuing, and doing. . . Space for autonomous and deviant thinking. Space for self-determination. And, finally, space for contextual differences and space for allowing the life world of the learner to enter the educational process” (p. 230).

Nevertheless, quadrant 3 represents essential pedagogies on the path toward the transformative and emancipatory learning and a “process of living education as a journey of personal and social emancipation, beyond the limits of any exogenous prescription” (Sauvé, 2017, p. 122).

Quadrant 4 of the framework is the interaction of transformative *and* emancipatory pedagogies. While often conflated, we conceptualize these as having distinct characteristics that, when combined, create a powerful leverage point for social change. The guiding question for this type of learning is “what can I become?”, implying a self-directed inquiry into the process of being – not only individually, but in community with other humans and non-humans. Thus, 4th-quadrant classrooms are designed in such a way that they cultivate emergence, described as a living quality of creative and dynamic education (Sterling, 2001; Macintyre, Lotz-Sisitka, Wals, Vogel, & Tassone, 2018). Further, in quadrant 4, the concept of sustainability can become immanent (Grange, 2017); that is, the concept, word, or term “sustainability” disappears from the focus of the discourse and becomes an intrinsic characteristic of the learning process. Learning in quadrant 4 is uncommon in sustainability education because it challenges institutional and classroom authority that can lead to shifts in power. The transformative-emancipatory classroom is the wild, de-colonized, chaotic realm of creative and unrealized possibility. Pedagogies of quadrant 4 are powerful leverage points in sustainability education, precisely because they advocate for a *constructive deviance* that is atypical of the other quadrants; however, they are difficult in practice because educators are not trained to use them, and students’ expectations and that of society in general are far removed. Nevertheless, Sauvé (2017) suggests appropriate methods of facilitation for the transformative-emancipatory classroom include those situated in “the fields of ecopedagogy, of critical environmental education, of ecocitizenship education, of community education in the context of “Vivir bien” or “Ubuntu,” and other “alter-native” educational theoretical and practical fields” (p. 121).

In summary, this framework is intended to provide a guide, map, or direction to strive toward (the yellow arrow, Figure 1). Addressing sustainability challenges now and in the future will require emergent solutions. It will require destabilization of existing power structures and a movement towards equity and justice for both human *and* non-human life-forms. It will require novel ways of being and experiencing the world. Thus, a movement away from instrumental and transmissive pedagogies in sustainability education toward transformative and emancipatory pedagogies, or their interaction, is recommended. Although the framework provided can guide sustainability educators on this journey, there are many daunting challenges of implementing transformative and emancipatory pedagogies in the classroom. In the next section, we describe contemplative practices as essential tools to assist in sustainability education, ones that can help us navigate rocky terrain and guide us toward the powerful combination of transformative and emancipatory learning.

Contemplative Pedagogy: Toward a Fourth Wave of Sustainability Education

Contemplative practices have been part of human history for thousands of years (Thurman, 2006, p. 1765). They have been incorporated into many spiritual traditions, including meditation in Buddhism, forms of yoga from Hinduism, and contemplative prayer in Christianity. However, the current conceptualization of contemplative practice among many scholars goes beyond religion to include the arts/creativity, activist approaches, and relational practices like storytelling (Figure 2). The concept of *contemplative education* has been defined as a “way of knowing that compliments the rational and the sensory” (Hart, 2004, p. 29), and “a set of pedagogical practices designed to cultivate the potentials of mindful awareness and volition in an ethical-relational context in which the values of personal growth, learning, moral living, and caring for others are

nurtured” (Roeser & Peck, 2009, p. 11). Other goals include the development of empathetic connection, compassion, creativity, and altruistic behavior (Zajonc, 2013).

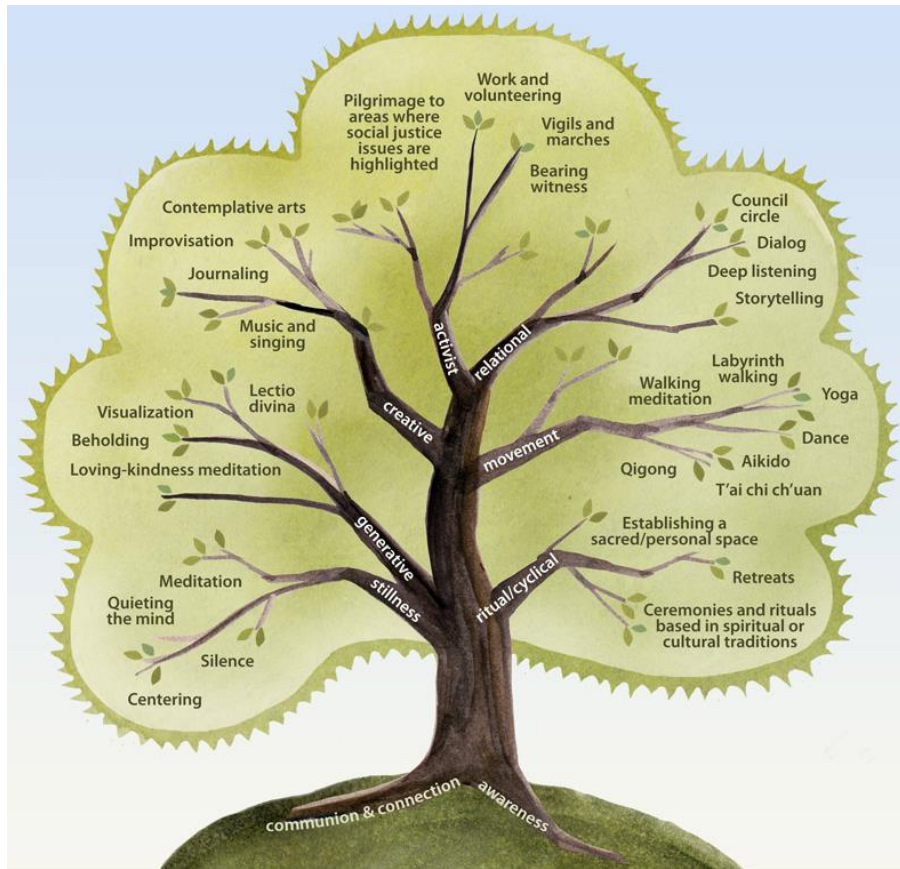


Figure 1. The tree of contemplative practices (CMIND, 2018).

The recent emergence of contemplation in education may appear to be sudden and rapid; however, it is more accurately a *re-emergence* of a form of education that has been suppressed by a prevailing rationalist approach that began centuries ago (Gunlaugson, Sarath, Scott, & Bai, 2014; Morgan, 2015). For example, Foucault (2005) noted the convergence and divergence of the academic and the contemplative over time, with special attention to what he refers to as the “Cartesian moment.” The current re-emergence then, might be seen as an impulse to return a *care of the self* to mainstream education. However, pedagogies of contemplation oriented toward care can foster benefits beyond the student. For example, in a recent study of marginalized environmental education learners, researchers concluded that an ethos of care led to “widening spheres” of care for self, others, and nonhumans (Schindel & Tolbert, 2017, p. 31).

Although contemplative education has distinct methods, pedagogies, journals, and conferences, the principles and goals overlap considerably with transformative and emancipatory learning approaches. These commonalities appear to be leading to shared practices and theories (Morgan, 2015). Prior work highlights the link between the contemplative and the transformative in broader education. For example, Zajonc (2013) lists contemplative pedagogies as being *a form of transformative education*, further stating that cultivation of awareness, penetrative insight, and full comprehension are the “true basis for social transformation” (p. 90). Duerr, Zajonc, and Dana (2003) completed a survey of transformative learning in IHEs and described growing

networks of contemplative practitioners suggesting that “the field of higher education is at an important juncture in its development, one in which the contemplative and spiritual can be integrated into learning and personal transformation” (p. 178). Robinson (2004) asked, “How can contemplative practices in the classroom foster the deepening of insight into the nature of this mind, this me that gives new meaning to education as transformation, education as liberation?” (p. 108). Roeser and Peck (2009) *define* contemplative education as having the aim of “personal growth and social transformation through the cultivation of conscious awareness and volition” (p. 2). Finally, Byrnes (2012) clearly describes contemplative teaching as “a framework that enables transformative experiences for teachers, students, and educational communities” (p. 25). Thus, many theorists and practitioners increasingly recognize the potential of incorporating contemplative practices in transformative and emancipatory learning.

This leads to the question: what is it about contemplative pedagogies that suggests they align specifically with sustainability education? Contemplative practices are essentially ways of knowing our subjective realities (Miller, 2014), and these inner lives we live are implicated in issues of sustainability. We crave material pleasures, leading to consumption. We assert our entitlement to the continuous availability of non-local goods, which leads to de-localization of food systems, carbon pollution, and social exploitation. Alternatively, empathy, compassion, cooperation, and creativity, all of which are fruits of contemplative practices (Brown, Creswell, & Ryan, 2015; Ostafin, Robinson, & Meier, 2015), can lead to more just and effective forms of social and ecological stewardship (Wapner, 2016), and are considered competencies of sustainability (Wiek et al., 2011). For this reason, many scholars consider contemplative practice to be an essential component of pursuing a sustainable future (Wapner, 2016; Eaton et al., 2016).

The integration of contemplative pedagogies in sustainability education is beneficial in *all four* quadrants of the framework (see Ericson, Kjørstad, & Barstad, 2014; Wamsler et al., 2017). In quadrant 1, contemplative practices such as mindfulness meditation and yoga have been shown to improve states of concentration (i.e., reduce distraction; Jain et al., 2007) and memory (Subramanya & Telles, 2009) respectively. These characteristics are essential to the knowledge-focused, rote-style learning characteristic of the first quadrant. Regarding quadrant 2, where learners are developing agency and self-determination, mindfulness meditation has been shown to be associated with both increased autonomy (Brown & Ryan, 2003) and the moderation of intrinsically motivated behavior (Ruffault, Bernier, Juge, & Fournier, 2015; Wamsler et al., 2017). In the instrumental-transformative dimension of sustainability education, contemplative pedagogies can help learners cope with the uncertainty, inevitable dilemmas, and emotional upheaval that is characteristic of transformative learning (Mezirow, 1991). For example, practices that cultivate compassion have been shown to improve emotional regulation and positive re-appraisal (Jazaieri et al., 2014; Hanley, Palejwala, Hanley, Canto, & Garland., 2015), both crucial skills for learners in transformative education settings. Finally, contemplative practice is perhaps most essential in the fourth quadrant of the framework, where creative emergence and collective social change are supported through pedagogies of meditation (Lebuda, Zabelina, & Karwowski, 2016), storytelling (Agelidou, 2010), and an awakening of the emotional, bodily, and intuitive faculties of learning (Pulkki, Dahlin, & Värri, 2017) that are crucial to the development of interconnected, yet liberated, learners.

To build momentum toward a fourth wave of sustainability education, one that utilizes pedagogies of contemplation, we suggest scholars engage in theorizing and researching such approaches in applied contexts. The fourth wave we describe will not be easy, requiring a

continuing evolution of pedagogies, and the emancipation of educators themselves. IHEs may also resist adopting pedagogies of contemplation when they themselves are not reflexive. Nevertheless, with the addition of 2 billion humans to the biosphere in the next 40 years, a re-evaluation of approaches to sustainability education is essential.

Finally, our framework for sustainability pedagogy is intended to be a reflective planning tool for educators in the field. As they plan their journeys (designing courses, units, or programs in the field), they should carefully consider which goals to strive for, and pedagogies to employ. Next, they can consider what role contemplative practices might play along the way. Alongside other competency-building, emancipatory, and transformative pedagogies, contemplative pedagogies may help to ease learners into a world that is already in rapid transition, and help to foster the awareness, compassion, and authentic care urgently needed in society.

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