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The Sustainable Human and Environmental Systems (SHES) Approach to Sustainability Education and Practice: Foundational Thematic Principles

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Abstract: The discourse that has emerged in recent decades about how to improve sustainability education in colleges and universities worldwide is among the most consequential of our time. This article and the four articles that follow it in this issue of the *OIDA International Journal of Sustainable Development* seek to contribute to this discourse by offering a supradisciplinary alternative to current approaches to sustainability education—the Sustainable Human and Environmental Systems (SHES) approach to sustainability education and practice. The SHES approach, which is the work of the SHES Roundtable, is both a conception of sustainability education and a step-by-step cognitive strategy for use by both students in the classroom and practitioners in the field to diagnose and to prescribe sustainable responses to situations that are inconsistent with a sustainable society. Since 2009, the SHES Roundtable has been a forum for academics and practitioners from throughout North America and beyond to pursue their commitment to providing college and university students with the knowledge and skills needed to meet the existential sustainability challenges that plague the modern world. Its work has been shaped by a solid grounding in first principles, a commitment to seeking consensus from all participants at all steps of the process, and the use of lessons learned from iterative experimentation in the classroom to inform the approach's fine structure as it has evolved over time. The result is a living set of recommendations concerning the pedagogy and administration of interdisciplinary and higher-order sustainability-focused degree programs in higher education. The SHES approach to sustainability education and practice includes a vision, a mission, and a strategic goal. The essence of the SHES vision is a world of "sustainable societies." The essence of the SHES mission is to sustain the viability of the human and environmental systems and interactions among the systems on which the realization of the vision depends. The essence of the SHES strategic goal is to bring about and to sustain the types of social learning needed to fulfill the mission. These aspirational goals present a formidable challenge to institutions of higher education. Although the SHES approach to sustainability education and practice has many attributes essential to meeting this challenge, it rests on seven foundational thematic principles: holism, supradisciplinarity, systems thinking, revealed complexity, social learning, stakeholder engagement, and universal applicability.

Keywords: Holism, revealed complexity, social learning, sustainability education, systems thinking.

Introduction

The discourse that has emerged in recent decades, especially in the West, about how to improve sustainability education in colleges and universities worldwide is among the most consequential of our time. Europeans have made many important contributions to this debate (see, e.g., Barth, 2014 [1]; O'Brien, 2016 [2]; Wheeler &

Bijuir, 2000 [3]). In the United States, the work of Will Focht, Shirley Vincent, and others to identify patterns and trends in environmental and sustainability degree programs nationwide, including in reports published by the National Council for Science and the Environment (NCSE), provided an early baseline for action (see, e.g., Vincent, 2010 [4]; Vincent, Bunn, & Stevens, 2012 [5]; Vincent, Bunn, & Sloane, 2013 [6]; Vincent & Focht, 2010 [7]; Vincent & Focht, 2011 [8]). Ira Feldman and his associates in the Sustainability Curriculum Consortium have played a crucial role in organizing broadly inclusive discussions about next steps and disseminating the results (see, e.g., Potter, Hiser, Evans & Feldman, 2023 [9]). Most recently, NCSE's successor—the Global Council for Science and the Environment (GCSE)—has embarked on an effort to develop accreditation criteria for sustainability and sustainability-related degree programs in higher education (see Global Council for Science and the Environment, 2025 [10]). The point of this article and the four articles that follow it in this issue of the *OIDA International Journal of Sustainable Development* is not to recount the history of this discourse or the vast literature associated with it, both of which often invoke interdisciplinarity as a key to unlocking the potential of sustainability education for students and practitioners alike. The point of these articles is to improve upon this recurring theme by offering a supradisciplinary alternative—the Sustainable Human and Environmental Systems (SHES) approach to sustainability education and practice. The SHES approach is not just a conception of sustainability education. It is also a step-by-step cognitive strategy for diagnosing and prescribing sustainable responses to the challenges posed by situations that are inconsistent with a sustainable society. As a cognitive strategy, the SHES approach is for use by both students in the classroom and practitioners in the field. The signature feature of the SHES approach is the use of holistic thinking (especially but not exclusively systems thinking) to reveal complexity holistically in a stepwise fashion as an alternative to the use of reductionist thinking (especially but not exclusively discipline-dependent thinking, including interdisciplinary thinking) to engage in analysis.

The seeds of the SHES approach to sustainability education and practice were sown more than twenty years ago in the work of the Interdisciplinary Environmental Association (IEA), an international organization of academics, practitioners, and concerned citizens who are committed to reaching across disciplinary boundaries and political borders in pursuit of shared environmental and sustainability goals (see Interdisciplinary Environmental Association, 2024 [11]). In 2000, the IEA held the first of a series of special sessions at its annual conferences on the design and delivery of interdisciplinary environmental degree programs in colleges and universities. One theme that emerged out of these sessions was consensus on the need for holistic approaches to the design and delivery of these programs if they are to produce graduates capable of doing what societies now expect of or at least need from those graduates. Another theme was a concern that the types of program structures, modes of implementation, and administrative practices that were the norm in higher education at the time were not up to this task. Meanwhile, other organizations were reaching similar conclusions, although from different perspectives. Against this backdrop, Michael Reiter, an environmental scientist now at Bethune-Cookman University who was leading the IEA conference sessions, and Will Focht, a political scientist at Oklahoma State University who was supervising the curriculum research effort of the National Council for Science and the Environment's Council of Environmental Deans and Directors,[1] convened and co-chaired what participants eventually would come to call the Sustainable Human and Environmental Systems (SHES) Roundtable.

Since 2009, the SHES Roundtable has been a collaborative forum for college and university faculty and administrators, practitioners, and others from throughout North America and beyond to pursue their commitment to providing students in institutions of higher education with the knowledge and skills needed by practitioners and whole societies to meet the existential sustainability challenges that plague the modern world. Its work has been shaped by a solid grounding in first principles, a commitment to seeking consensus from all participants at all steps of the process, and the use of lessons learned from iterative experimentation in the classroom to inform the approach's fine structure as it has evolved over time. Progress in the early years was slow as participants repeatedly looped back to revisit foundational concepts and perspectives, as well as the name of the Roundtable itself (compare, e.g., Reiter et al., 2011 [12], with Reiter et al., 2012 [13], with Barresi et al., 2015 [14], with Focht & Barresi, 2019 [15]). Within a decade, however, the various strands of the Roundtable's work had solidified into a coherent whole (see Focht, Reiter, Barresi & Smardon, 2019 [16]). The result is the SHES approach to sustainability education and practice, a living set of recommendations concerning the pedagogy and administration of interdisciplinary and higher-order, sustainability-focused degree programs in higher education and their implications for sustainability practice (cf. Barresi, Reiter & Smardon, 2022 [17]). The SHES approach embraces the education not only of students *per se* but also of practitioners

[1] The National Council for Science and the Environment's Council of Environmental Deans and Directors is now the Global Council for Science and the Environment's Alliance of Sustainability and Environmental Academic Leaders.

and whole societies as a prerequisite for transforming unsustainable societies into sustainable ones (cf. Focht & Barresi, 2019, p. 62 [15]).

Foundational Thematic Principles of the SHES Approach

"Sustainability," like "sustainable development," is a contested concept (compare, e.g., Salas-Zapata & Ortiz-Muñoz, 2019 [18], with Kates, Parris & Leiserowitz, 2005 [19]). One of the consequences of the ongoing debate over the meaning of the term and concept is that defining the scope of a "field of sustainability" is a problematic endeavor at best (cf. Reiter et al., 2012, p. 109 [13]). For that reason, the SHES Roundtable abandoned its initial effort to define "sustainability" as a term and concept in favor of a "definition by specification" approach by articulating the goal of the corresponding academic domain—the emergence of sustainable societies—and then fleshing out the meaning and implications of that concept in a rigorous way (see Reiter et al., 2011, p. 66 [12]). The result is a vision, a mission, and a strategic goal. The essence of the SHES vision is a world of "sustainable societies," defined as societies that, at a minimum, facilitate, enhance, and sustain indefinitely in that facilitated or enhanced state the well-being of human individuals, their communities, and their environments (see Focht & Barresi, 2019, p. 62 [15]). The essence of the SHES mission is to sustain the viability of the human and environmental systems and interactions among those systems on which the realization of the vision depends (Focht & Barresi, 2019, p. 63 [15]). Doing so requires, at a minimum, maintaining the structural integrity, functional utility, adaptive capacity, and resilience of the systems and the number and diversity of their interactions (Focht & Barresi, 2019, p. 63 [15]). The essence of the SHES strategic goal is to bring about and to sustain the types of social learning needed to fulfill the mission (Focht & Barresi, 2019, p. 63 [15]). Social learning in this context is a society-wide process in which individuals learn from each other and behave accordingly, especially but not exclusively in their activities at the human-environment interface, in ways calculated to transform unsustainable societies into sustainable ones and to maintain them as such (cf. Focht & Barresi, 2019, p. 63 [15]).

These aspirational goals present a formidable challenge to institutions of higher education: specifically, how to design and to deliver degree programs that will prepare students to contribute to the transformation of unsustainable societies into sustainable ones, the viability of the human and environmental systems on which the sustainability of those societies depends, and the social learning needed to ensure that those systems remain (or become and then remain) viable ones. Although the SHES approach to sustainability education and practice has many attributes essential to meeting this challenge (see generally, e.g., Focht et al., 2019 [16]), it rests on seven foundational thematic principles: holism, supradisciplinarity, systems thinking, revealed complexity, social learning, stakeholder engagement, and universal applicability.

Holism

The experiences of societies worldwide have made clear that reductionist perspectives are ill-suited to grappling with the complexity of the situations that make societies unsustainable. For the same reason, those perspectives are also ill-suited to the task of transforming unsustainable societies into sustainable ones. Holistic perspectives—which, by definition, recognize the crucial role of the complexity of wholes in making them what they are—are needed instead. For that reason, degree programs in colleges and universities that aspire to produce graduates with the knowledge and skills needed by practitioners and whole societies to transform unsustainable societies into sustainable ones must foster these holistic perspectives (see Focht & Barresi, 2019, pp. 64, 77 [15]). This pedagogical imperative implies the value of the second foundational thematic principle of the SHES approach—supradisciplinarity.

Supradisciplinarity

The reductionist perspectives inherent in discipline-dependent thinking represent a substantial impediment to fostering the holistic perspectives needed for college and university graduates to contribute to the transformation of unsustainable societies into sustainable ones. The SHES approach to sustainability education and practice embraces supradisciplinarity as a response (see Focht & Barresi, 2019, p. 77 [15]). The layering of discipline-dependent perspectives into a cognitive sandwich does not offer a holistic perspective on the world. Cross-disciplinary cognitive lenses that recognize disciplinary boundaries—whether through the juxtaposition of disciplines (multi-disciplinarity), the intersection of disciplines (transdisciplinarity), the overlap of disciplines (pluridisciplinarity), or the union of disciplines (interdisciplinarity)—are not much more useful. Those perspectives all retain discipline-dependent concepts and methods, with the overlap or union of disciplines nevertheless being marginally better than the other perspectives (see Reiter et al., 2011, pp. 64–65 [12]; Reiter et al., 2012, pp. 111–12 [13]; Reiter & Smardon, 2019, pp.

229–30 [20]).[2] Supradisciplinarity achieves cognitive holism by transcending disciplinary boundaries entirely. In the SHES approach to sustainability education and practice, the third foundational thematic principle—systems thinking—plays a crucial role in this process.

Systems Thinking

Systems thinking has emerged in recent years as an indispensable tool for grappling with the complex challenges inherent across a broad range of fields of study and practice (see, e.g., Jackson, 2019 [21]). In that spirit, the SHES approach to sustainability education and practice recognizes that the most useful way to conceptualize education for sustainability is as the holistic study of the interrelations of human and environmental systems on Earth. The SHES approach recognizes that the distinction between these two types of systems—and, thus, the location of the interface along which their interactions occur—is often unclear. Sometimes, the best that can be said about the world in which we live is that it is a dynamic amalgam of elements of human and non-human systems that together form an integrated supersystem of global dimensions. Given this complexity, the SHES approach relies on systems thinking as a core holistic thinking strategy, although not necessarily the only one (compare, e.g., Focht & Barresi, 2019, pp. 64–65, 66, 68, 69 [15], with Barresi, 2019, pp. 104–05 [22]). The principal task of systems thinking in the SHES approach is to reveal the complexity of situations that are inconsistent with a sustainable society (see Focht & Barresi, 2019, pp. 64–65, 68–69, 70–71, 77 [15]), which invokes the fourth foundational thematic principle of the SHES approach.

Revealed Complexity

At the core of the SHES approach to sustainability education and practice is the use of systems thinking to reveal the systemic and interactional complexity of situations that are inconsistent with a sustainable society as an alternative to the reductionist perspectives inherent in discipline-dependent thinking (see Focht & Barresi, 2019, pp. 64–65 [15]). *Complexity* in this context is the number and diversity of the elements of a given phenomenon (Focht & Barresi, 2019, p. 65 [15]). *Systemic complexity* is the number and diversity of systems that make that phenomenon what it is (Focht & Barresi, 2019, p. 65 [15]). *Interactional complexity* is the number and diversity of the interactions among those systems that make the phenomenon what it is (Focht & Barresi, 2019, p. 65 [15]). The SHES approach also uses systems thinking as a means of revealing complexity to envision alternatives to situations that are inconsistent with a sustainable society as well as viable means of transforming the current situations into the envisioned alternatives (see Focht & Barresi, 2019, pp. 64, 65 [15]; see also Focht & Barresi, 2019, pp. 77–79 [15]). Thus, the SHES approach maintains a supradisciplinary—and, thus, holistic—perspective on the current situation or future alternative of interest while gradually revealing its complexity in systems thinking terms (see Focht & Barresi, 2019, pp. 68–75 [15]; see also Barresi, 2019, pp. 108–16 [22]). The SHES approach also conceptualizes societies as self-organized, holarchic, and open systems of human relationships in which the social learning that is the strategic goal and fifth foundational thematic principle of the SHES approach occurs (see Focht & Barresi, 2019, pp. 63–64 [15]).

Social Learning

Social learning is the strategic goal of the SHES approach to sustainability education and practice because it is the only way of ensuring that unsustainable societies can be transformed into societies that can be sustained indefinitely (see generally Morrison, Focht & Bunch, 2019 [23]). Social learning entails observing others' behavior and then adopting that behavior as one's own (Focht & Barresi, 2019, p. 63 [15]). This process has an emotional dimension, which shapes how people interpret social reality (Focht & Barresi, 2019, p. 63 [15]). One result of this relationship is that the behavioral change that results from social learning is merely the most visible manifestation of the transformation of sociocultural norms and practices (Focht & Barresi, 2019, p. 63 [15]). In the SHES approach, this transformation is intended to provide the principal motivation for individuals, communities, and whole societies to work together to achieve the SHES vision of a world of sustainable societies (Focht & Barresi, 2019, p. 77 [15]). The stakeholders in any situation that is inconsistent with a sustainable society are the most important potential contributors to or detractors from the transformation of that situation into a sustainable alternative. For that reason, the SHES approach puts special emphasis on a sixth foundational thematic principle—stakeholder engagement.

Stakeholder Engagement

Stakeholders figure prominently in the SHES approach to sustainability education and practice, as they must in any approach to education or practice that seeks to foster the transformation of unsustainable societies into sustainable

[2] For more on this point, see the SHES article on *The Administrative Challenge* in this issue of the *OIDA International Journal of Sustainable Development*.

ones. In the SHES approach, it is the stakeholders who decide which current situations are of concern because they seem to be inconsistent with a sustainable society (see Focht & Barresi, 2019, p. 64 [15]). It is these same stakeholders whose well-being-related valuations of systems and interactions among those systems ultimately validate that concern (see Focht & Barresi, 2019, pp. 63, 64, 65, 66, 67–68, 69 [15]). The stakeholders also are the people who envision sustainable alternatives to current, unsustainable situations as well as the interventions that would be needed to transform the one into the other and who ultimately will bring those interventions about (see Focht & Barresi, 2019, pp. 73–76, 79 [15]). One result of the transformation process is social learning, in which stakeholders play a pivotal role as well (see Focht & Barresi, 2019, pp. 63–64, 75 [15]; see also Focht & Barresi, 2019, p. 77 [15]). Accordingly, the SHES approach to sustainability education and practice contemplates engagement with the stakeholders throughout its many steps. In the field, it is the stakeholders *per se* who serve in that capacity; in the classroom, students must act as proxies for the stakeholders (cf., e.g., Focht & Barresi, 2019, p. 66 [15]). The relevance of stakeholder engagement to both education in the classroom and practice in the field implies the seventh foundational thematic principle of the SHES approach to sustainability education and practice—its universal applicability.

Universal Applicability

By design, the SHES approach to sustainability education and practice is universally applicable, regardless of institutional setting or subject matter context (see Reiter et al., 2011, pp. 61–62, 66, 70, 73 [12]; Reiter et al., 2012, pp. 109, 113, 116 [13]; Reiter & Smardon, 2019, pp. 232, 236 [20]). As a result, the SHES approach is suitable for use not only with students who are enrolled in academic or pre-professional courses and programs in colleges and universities large and small but also by practitioners in the field. In the classroom, the SHES approach is inherently well suited for use across a full spectrum of courses and programs—not just in stand-alone "sustainability" courses and programs but also in others as a complement to content defined by reference to discipline-dependent criteria, such as in environmental science or studies, political science or sociology, environmental ethics, or business administration. In the field, the SHES approach lays out a process for diagnosing the challenges posed by situations that are inconsistent with a sustainable society and prescribing sustainable responses, regardless of the setting or context. It then provides practitioners with a blueprint for educating the stakeholders in the situation as a prerequisite for fostering the social learning needed to realize the SHES vision—a world of sustainable societies.

Conclusion

Since its founding in 2009, the SHES Roundtable has grappled with the many profound challenges that are posed by what is probably the most pressing academic question of our time: how can colleges and universities succeed in providing students with the knowledge and skills needed by practitioners and whole societies to meet the existential sustainability challenges that plague the modern world? The result is the SHES approach to sustainability education and practice—a coherent, stepwise strategy for teaching and learning in the classroom and beyond, which has been shaped by a solid grounding in first principles, a commitment to consensus among Roundtable participants, and lessons learned from iterative experimentation in the classroom. The SHES approach rests on seven foundational thematic principles, including its universal applicability, regardless of institutional setting or subject matter context, and has crucial implications not only for pedagogy but also for program design and administration and professional standards of practice and codes of ethics.[3] As it has evolved over time, the SHES approach also has burst the bonds of its original academic focus, now also providing practitioners in the field with a blueprint for engaging stakeholders in ways calculated to foster the social learning needed to build sustainable societies. As a result, the SHES approach to sustainability education and practice is an especially promising strategy for harnessing both academics and action as essential tools in the struggle to realize the SHES vision—a world of sustainable societies.

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[3] For more these topics, see the SHES article on *The Administrative Challenge*, *The Pedagogical Challenge*, *Program Evaluation, Transformation, and Recognition*, and *From the Classroom to the Workplace* in this issue of the *OIDA International Journal of Sustainable Development*.

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