Weaving Equity and Sustainability into the Fabric of Higher Education: The University of Utah Experience

Adrienne Cachelin,[1] Ann Darling,[2] Brett Clark,[1] and Kim Hackford-Peer[3]

Abstract

Sustainability is an idea that is celebrated, loathed, or deemed entirely useless given its many meanings and approaches. While scholars broadly agree it must include merging ecology, economy, and equity, there remain serious challenges, such as how each dimension is weighted, integrated, and presented. Definitional issues and disciplinary foundations are another chronic problem even as the number of sustainability programs in higher education continues to grow. At the same time, colleges and universities across the country are reaffirming their commitment to equity education, recognizing the critical importance of graduates' abilities to speak across differences and bridge ethnic divides. This article offers consideration of how a systems thinking assessment tool, designed to match those created by the American Association of Colleges and Universities, might support general education requirements while advancing both sustainability and equity. In this article, we share a rubric and strategy designed to clarify definitional issues and make the inseparability of equity and sustainability explicit at institutions of higher education.

Keywords: equity; general education; interdisciplinary; sustainability; systems thinking

Introduction

Early on in my role as Director for Sustainability Education, I (AC) had an experience that remains problematically in my memory. Tasked with expanding sustainability education across campus, I met with an about-to-retire natural science professor regarding the hows and whys of integrating sustainability into introductory classes within the department. These courses have some of the largest undergraduate enrollment and thus the potential to engage a lot students. This professor sat, legs wide apart, slouched low in his seat, tossing popcorn in his mouth, telling me definitively that his science was, in fact, sustainability. Furthermore, without money directed his way, there would be no curricular shifts elucidating chemical processes and the changing climate; there would be no explicit connection to matter cycling and limited resources; and there would certainly be no discussion of the relationship between limited resources and their distribution in the context of equity. Aside from what I experienced as a tremendously dismissive, uncomfortable, and gendered power dynamic, there were powerful lessons playing out. Within his college, as in so many other places, money talks. Lacking additional resources, the integrative reimagining required to advance sustainability education was not going to happen. Even the notion of limits, within a natural science department, was not being taken seriously. And despite the fact that universities have committed to advancing equity throughout curriculum and institutional policies, for this faculty member at least, equity was not the province of their work.

This situation manifests in different ways across universities, between fields of study, and among scholars. As part of a 2015 campus-wide initiative to elevate the significance of sustainability while fostering interdisciplinary collaboration, several faculty administrators began a project to

[1]College of Social and Behavioral Science, Environmental and Sustainability Studies/Sustainabilty Office, [2]Undergraduate Studies, Office of General Education, [3]School of Cultural and Social Transformation, Gender Studies, University of Utah, Salt Lake City, Utah.

integrate sustainability learning outcomes into majors across campus. Academic leaders within the social sciences assumed that advancing sustainability outcomes tailored to each department's realm of study would be an easy process. Nothing could be further from reality. Meeting with faculty in each department, it was clear that there was much consternation. Oftentimes, faculty in the social sciences understood the importance of questions regarding equity, but assumed that other elements of sustainability were separable and the responsibility of natural sciences faculty. In many ways, this is the "human exemptionalist paradigm" in action—the belief that culture and society are independent from the finite "web of nature."[1] Within this orientation, social relationships with the natural world are often ignored and it is assumed that humans can innovatively transcend biophysical limits.

This is what disciplinarity and a lack of definitional clarity can look like and yield in higher education. Oftentimes, certain dimensions of sustainability are privileged, while others are ignored. Integration is regularly absent. These examples illustrate the complexity of advancing sustainability *and* equity, even at a time when commitment to both of these ideals continues to grow,[2] and these experiences helped define a multiyear strategy to embed comprehensive sustainability education at our university.

Challenging Sustainability Understandings

The most common definition of sustainable development, used interchangeably with sustainability, is from the United Nations Report of the World Commission on Environment and Development (WCED), which describes sustainable development as "meeting the needs of today without compromising the needs of future generations."[3] While not discussed as much, the same report indicates that equity is integral. Even the narrow notion of physical sustainability implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation.[3] Furthermore, the connections between equity and ecology were more explicitly acknowledged in the following statement: A world in which poverty and inequity are endemic will always be prone to ecological and other crises.[3]

This integrated understanding is also essential to the UN Sustainable Development Goals, which recognize that "ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth—all while tackling climate change and working to preserve our oceans and forests."[4] Nevertheless, the partial definition is most consistently used. At best, this definition connotes intergenerational equity or a functional-into-the-future notion; at worst it signifies a built-to-maintain-profit mindset. In many ways, depending on the simplified definition ensures that the status quo is maintained while sustainability efforts are limited to environmental management and technological fixes.

Perhaps in response to this truncated conception, some scholars regard sustainability as having separable components, unintentionally setting equity and quality of life in opposition to environmental health. Others hope to maintain the notion of sustainability envisioned by the WCED and UN with their inherent notions of justice and equity. According to Agyeman, Bullard, and Evans:

> Sustainability cannot be simply a "green," or "environmental" concern, important though "environmental" aspects of sustainability are. A truly sustainable society is one where wider questions of social needs and welfare, and economic opportunity are integrally related to environmental limits imposed by supporting ecosystems. (p. 78)[5]

This line of thinking contributed to the conception of just sustainability, which involves ensuring "a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystems." (p. 157)[6] Critical sustainability, in many ways evolving from the inclusive conception of just sustainability, uses a critical theory lens to unmask intertwined social and economic systems of oppression enforced through global capitalism.[7] Understanding the growth imperative highlights capitalism's role as a major driver of inequity and ecological degradation; yet, too often, its actual workings as a distinct system are ignored.[8–10] While acknowledging that sustainability must integrate environmental, social, and economic vitality, inherent tensions must also be recognized. Suistainability is commonly portrayed as a sweet spot of sorts despite the fact that its comprehensive execution is profoundly challenging.

Eric Schlosser provides a compelling example of this complexity inherent in asking if an organic tomato can be considered sustainable if grown by slaves.[11] This question has rocked many thoughtful eaters; introducing human equity into a conversation generally focused solely on the environmental elements of sustainability is challenging. Schlosser's question is so

provocative because it nudges us beyond disciplinary lines and toward systems thinking. It asks us to consider the underlying causes of inequity and how they are connected to economic and ecological systems.

Given the evolution of sustainability thinking, a more inclusive and comprehensive understanding of the foundational concepts, the big ideas, might help academics more readily embrace an integrated approach.[8–12] These include: respect for limits, interdependence, economic restructuring, fair distribution, intergenerational perspectives, cultural diversity, indigenous/traditional knowledges, true cost accounting, and systems thinking.[13,14] These big, broad, overlapping, and multifaceted ideas replant sustainability implementation in the messily tangled and topical real world, whose inseperable nature demands an integration of equity, ecology, and economy. Narrow definitions that exclude these interactions are bound to miss the point.

In many ways, it is evident that sustainability is at a crossroads. Scholars have determined that superficial, ambiguous, and evolving constructions of sustainability, and a lack of conceptual understanding of big ideas, impede effective sustainability education.[4,7] Additionally, students are prone to conflate sustainability with what Annie Leonard[15] refers to as good moral hygiene—things such as recycling and green consumption.[16] Data suggest that the content of these programs rarely achieves the necessary integration,[17] thus conceptual clarity and more defined measurement strategies are critical. Given that this need coincides with institutional and national support for the integration of both sustainability education and equity,[2] a multidisciplinary faculty group considered how a systems thinking learning outcome rubric can elucidate the inextricable nature of sustainability and equity, and facilitate broad goals in higher education.

Systems Thinking for Equity and Sustainability

Systems thinking is rooted in the work of organismic biologists in the 1920s.[18] These biologists noted the limitations of the popular mechanistic approach within science, contending that a reductionistic understanding of cell structure was not adequate for explaining the phenomena of life. For them, it was necessary to analyze the structure *and* relationship, different levels of organization, and processes in order to understand the functions associated with life, that is, the whole is greater than the sum of its parts. This shift has also taken place in seminal work in ecology, psychology, and physics, and later in cybernetics and information theory. Meadows and Wright explain that "there is an integrity or wholeness about systems and an active set of mechanisms that maintain that integrity." (p.12)[18] Such understanding demands a new way of thinking; it requires a focus on connectedness, interactions, and relationships.

Given that systems thinking is central to sustainability, it is essential to consider the necessary paradigmatic shift this creates. Capra and Luisi identified eight important characteristics of systems thinking including shifting perspectives: 1.) from parts to wholes, 2.) from single discipline to inherent multidisciplinarity, 3.) from objects to relationships, 4.) from measuring to mapping, 5.) from quantities to qualities, 6.) from structures to processes, 7.) from objective to epistemic knowledge, 8.) from Cartesian certainty to approximate knowledge.[8] They explain that this revolutionary approach to knowing involves putting things together within the context of the larger whole, rather than taking things apart. Meadows and Wright, recognizing the importance of this shift, explain that

> you can't navigate well in an interconnected, feedback-dominated, world unless you take your eyes off short-term events and look for long-term behavior and structure … unless you take into account limiting factors, nonlinearities and delays. You are likely to mistreat, misdesign, or misread systems if you don't respect their properties of resilience, self-organization, and hierarchy. (p. 87)[18]

While this complexity may at first seem daunting, it reveals linkages for connection and engagement. It offers a more comprehensive understanding necessary for addressing the socioecological challenges we confront today. It provides a way for students to see themselves as a part of something larger, as a part of the socioecological world.

These ideas, grounded in a recognition of the importance of systems thinking for all students, were the starting point for discussions about how all students could be engaged in this type of thinking throughout their college experiences rather than designating such learning to a single required sustainability course nested within an academic landscape of disciplinary silos and reductionist thinking.[19] We recognized systems thinking as a more foundational and necessary outcome of higher education, akin to critical thinking. We engaged a multidisciplinary team of faculty to work with our Office of General Education to develop an assessment rubric for systems thinking, one that would be in step with those used for learning outcomes at the university.

MARY ANN LIEBERT, INC. • Vol. 12 No. 6 • December 2019 • DOI: 10.1089/sus.2019.0026

Systems Thinking: Implications for Sustainability in General Education

Because distinct epistemological approaches orient academics, students, and citizens toward particular ways of understanding the interconnections of ecology, economy, and equity, there remain profound challenges in bridging ways of thinking and generating knowledge.[20,21] Take, for example, our natural science professor who is happy to teach students how to clean up a chemical spill but refuses to consider how this incident impacts different populations. He may be epistemologically situated in the "empirical is" rather than "justice-oriented ought," using an approach that may be based in a worldview of environmental management and technological fixes. Whatever the reason, such an approach to sustainability is inadequate as it provides a two-dimensional snapshot of a singular problem with a singular technical solution. It masks the more important investigations of the patterns that resulted in the spill and how such spills might systemically and proactively be avoided. It misses the inequities within those patterns and how those patterns not only led to the spill but also further perpetuate inequities.

Students need more complete and integrated understandings. They need a three-dimensional network that offers many places in which they can, and do, play a role in shaping these conditions. David Orr famously suggested that all education is environmental education based on what is included and excluded. As an example, he notes an economist who "fails to connect our economic life with that of ecosystems and the biosphere."[22] He argues that in such a case, the economist has taught the powerful and incorrect lesson that ecosystems and economics are unrelated. Orr indicates that "our goal as educators ought to be to help students understand their implicatedness in the world … to see systems and patterns."[23] Thus, similar to the economist, the natural science professor, who will not consider the socioeconomic causes and effects of the spill or the justice-oriented ramifications, effectively places blinders on students who then learn to see the world in reduced and disconnected ways. This works against the integrative components of sustainability and equity while also undermining the development of active and engaged citizens.

With general education being described as "the part of the curriculum deliberately designed to prepare all students for life, work, and citizenship by preparing them to think analytically and learn collaboratively,"[24] and, the Office of General Education promoting effective pedagogies including collaborative projects and diversity/global learning, it became clear that general education is the perfect place for this work. The emergence of complex global challenges demands that we prepare our students for the reality of a world threatened by an unstable climate, deepening racial and ethnic tensions, profound inequity, and their devastating synergies. Thus,we have designed and are pursuing the implementation of a systems thinking rubric, modeled after those created by the American Association of Colleges and Universities (AAC&U), that will clarify the inseparability of sustainability and equity.

As with many universities and colleges across the United States, the learning outcomes and VALUE (Valid Assessment of Learning in Undergraduate Education) rubrics have been implemented at the University of Utah. The full list can be found at: https://ugs.utah.edu/general-education/learning-outcomes.php. These learning outcome rubrics underlie general education requirements, including physical/life sciences, humanities, and social and behavioral sciences, and while some of these rubrics touched on interdisciplinarity and integration, we found a lack of explicit systems thinking indicators. As such, based in the systems thinking literature as well as the lenses of a disciplinarily diverse faculty group, we created such a rubric. (See Table 1.)

This rubric includes an indicator related to socioecological problem solving in which capstone-level students must demonstrate the ability to map pathways between human activities and human and ecological health that often result in social inequality. It includes an indicator about limits in which students analyze systemic limits and the ways in which human systems can and do threaten ecological systems and impose social difference. It includes an indicator in regard to synthesizing equity, ecology, and economy in which capstone-level students will analyze how historical patterns of domination and control over marginalized groups are connected to patterns of domination over the land and reflect relationships of power that continue to produce multiple sites of marginalization. These indicators employ systems thinking as a means to understand the importance of relations, context, and the fact that the whole is greater than the sum of its parts, and they also make the connection between sustainability and equity more comprehensible, measurable, and explicit. In this, the rubric helps institutionalize a comprehensive conception of sustainability.

Conclusion

As the Office of General Education revisits a learning framework for the

Table 1. Systems Thinking Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
Complexity	Analyzes and articulates concepts of interdependence and dynamic interrelationships within and between systems (e.g., feedbacks between social and ecological systems).	Analyzes concepts of interdependence and dynamic interrelationships within and between systems (e.g., feedbacks between social and ecological systems).	Describes concepts of interdependence and dynamic interrelationships within and between systems (e.g., feedbacks between social and ecological systems).	Considers concepts of interdependence and dynamic interrelationships within and between systems (e.g., feedbacks between social and ecological systems).
Limits	Analyzes systemic limits (e.g., carrying capacity) and the ways in which human systems can and do threaten ecological systems and impose social difference. Articulates that limited resources mandate distribution as an issue of social justice.	Analyzes systemic limits (e.g., carrying capacity) and the ways in which human systems can and do threaten ecological systems and impose social difference.	Explains systemic limits (e.g., carrying capacity) and the ways in which human systems can and do threaten ecological systems and impose social difference.	Describes systemic limits (e.g., carrying capacity) and the ways in which human systems can and do threaten ecological systems and impose social difference.
Socio-ecological problem-solving	Maps pathways between human activities and human and ecological health that often result in social inequality. Analyzes ways to solve these problems with human and ecological health and social equity in mind.	Describes how human activities affect human and ecological health that often result in social inequality. Analyzes ways to solve these problems with human and ecological health and social equity in mind.	Describes how human activities affect human and ecological health that often result in social inequality. Considers ways to solve these problems with human and ecological health and social equity in mind.	Frames problems from either a social or ecological perspective and describes how human activities affect human and ecological health that often result in social inequality.
Synthesizes economy, ecology, & equity	Analyzes how historical patterns of domination and control over marginalized groups are connected to patterns of domination over the land and reflect relationships of power that continue to produce multiple sites of marginalization.	Explains how historical patterns of domination and control over marginalized groups are connected to patterns of domination over the land and reflect relationships of power that continue to produce multiple sites of marginalization.	Describes how historical patterns of domination and control over marginalized groups are connected to patterns of domination over the land and reflect relationships of power that continue to produce multiple sites of marginalization.	Recognizes that historical patterns of domination and control over marginalized groups are connected to patterns of domination over the land and reflect relationships of power that continue to produce multiple sites of marginalization.
Life cycle analysis	Generates an accounting of true ecological and social costs to include the full life of a product or process as well as externalities such as impacts on ecological systems, social equity, and human health.	Analyzes true ecological and social costs, including the full life of a product or process as well as externalities such as impacts on ecological systems, social equity, and human health.	Describes ecological and social costs of a process or product through its life cycle including externalities such as impacts on ecological systems, social equity, and human health.	Shows cursory awareness of need to determine true ecological and social costs or the concept of externalities.
Integrating disciplines	Integrates academic disciplines to solve socioecological problems, is informed by an historical perspective, and applies integration to real-world cases.	Integrates academic disciplines to solve socioecological problems, is informed by an historical perspective, and considers how ideas may be applied to real-world cases.	Integrates academic disciplines to solve socioecological problems and is informed by an historical perspective.	Considers multiple academic disciplines to solve socioecological problems and is informed by an historical perspective.

university and strives to better articulate the goals and values of general education for our students, our hope is that the elements described, which have been recognized not only as missing from general education but as an elegant way to explicitly integrate sustainability and equity, can be useful not only on our own campus, but across the country. On our campus, this rubric has become a part of our foundation for thinking about general education. The next steps will include faculty workshops to aid in the creation of assignments to provide opportunities for this assessment. From our perspective, a required systems thinking learning outcome for all students provides a powerful way forward for both sustainability and equity education.

MARY ANN LIEBERT, INC. • Vol. 12 No. 6 • December 2019 • DOI: 10.1089/sus.2019.0026

Author Disclosure Statement

No competing financial interests exist.

References

1. Catton W, and Dunlap R. A new ecological paradigm for post-exuberant sociology. Am Behav Sci 1980;24 (1):15–47.
2. Williams DA, Berger JB, and McClendon SA. Toward a Model of Inclusive Excellence and Change in Postsecondary Institutions. Association of American Colleges and Universities, Washington, DC, 2005. https://inclusionandbelongingtaskforce.harvard.edu/publications/toward-model-inclusive-excellence-and-change-postsecondary-institutions (last accessed 11/14/2019).
3. World Commission on Environment and Development (WCED). *Our Common Future: Report of the World Commission on Environment and Development.* Oxford University Press, Oxford, England, 1987, p. 37. https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf (last accessed 11/14/2019).
4. United Nations. United Nations Sustainable Development Goals. 2019. https://sustainabledevelopment.un.org/sdgs (last accessed 11/14/2019).
5. Agyeman J, Bullard RD, and Evans B. Exploring the nexus: Bringing together sustainability, environmental justice and equity. Space and Polity 2002;6(1):77–90. DOI 10.1080/13562570220137907.
6. Agyeman J, and Evans B. 'Just Sustainability': The emerging discourse of environmental justice in Britain? Geogr J 2004;170(2): 155–164. http://www.jstor.org/stable/3451592 (last accessed 11/14/2019).
7. Cachelin A, Rose J, and Rumore DL. Leveraging place for critical sustainability education: The promise of participatory action research. J Sustain Educ 2016;11. http://www.susted.com/wordpress/content/leveraging-place-for-critical-sustainability-education-the-promise-of-participatory-action-research_2016_03/ (last accessed 11/14/2019).
8. Capra F, and Luisi PL. *The Systems View of Life: A Unifying Vision*. Cambridge University Press, Cambridge, England, 2014. DOI:10.1017/CBO9780511895555.
9. Cachelin A, Rose J, and Paisley K. Disrupting neoliberal discourse in critical sustainability education: A qualitative analysis of intentional language framing. Environ Educ Res 2014;21:1–6. DOI 10:1080/13504622.2014.974023.
10. Clark B, Auerbach D, and Longo SB. The bottom line: Capital's production of social inequalities and environmental degradation. J Environ Stud Sci 2018;8(4):562–569.
11. For a discussion of Eric Schlosser's question, see: Gottlieb R, and Joshi A. *Food Justice*. The MIT Press, Cambridge, MA, 2010.
12. Sze J. *Approaches to Environmental Justice and Social Power*. NYU Press, New York, 2018.
13. Nolet V. Preparing sustainability-literate teachers. Teach Coll Rec. 2009;111(2):409–442.
14. MacGregor J, and Nolet V. Sustainability Core Topics and Big Ideas. Handout, Association for the Advancement of Sustainability in Higher Education Conference, Portland, OR, Oct. 26–29, 2014.
15. Leonard A. Keynote address, Association for the Advancement of Sustainability in Higher Education Conference, Portland, OR, Oct. 26–29, 2014.
16. Sherman DJ. Sustainability: What's the big idea? A strategy for transforming the higher education curriculum. Sustain J Record. 2008;1 (3):188–195.
17. O'Byrne D, Dripps W, and Nicholas K. Teaching and learning sustainability: An assessment of the curriculum content and structure of sustainability degree programs in higher education. Sustain Sci 2014; 10:43–59. DOI:10.1007/s11625-014-0251-y.
18. Meadows DH, and Wright D. *Thinking in Systems: A Primer*. Chelsea Green Publishers, White River Junction, VT, 2008.
19. Fisher P. Developing whole-systems competency in higher education to meet emerging market demand and societal sustainability. Sustain J Record 2014;7:54–62. DOI:10.1089/SUS.2014.9816.
20. Lang DJ, Wiek A, Bergmann M, et al. Transdisciplinary research in sustainability science: Practice, principles, and challenges. Sustain Sci 2012;7 (SUPPL. 1):25–43. https://doi.org/10.1007/s11625-011-0149-x (last accessed 11/14/2019).
21. Strober M. Communicating across the academic divide. Chron High Educ 2011;57(1),A23. https://www.chronicle.com/article/Communicating-Across-the/125769 (last accessed 11/14/2019).
22. Orr D. *Earth in Mind*. Island Press, Washington, DC, 1994.
23. Grist staff. David Orr, Environmental Educator and Writer, Answers Questions. Oct. 26, 2004. https://grist.org/article/orr/ (last accessed 11/11/2019).
24. Gaston P. General Education Transformed: How We Can, Why We Must. American Association of Colleges and Universities, Washington, DC, 2015. https://secure.aacu.org/iMIS/ItemDetail?iProductCode=E-GMSTRANS&Category=LEAP&WebsiteKey=bce618ce-91ef-4ecc-9c9d-a116c1a6d37c (last accessed 11/11/2019).

Address correspondence to:
Dr. Adrienne Cachelin
University of Utah
260 South Central Campus Drive
GC 4540
Salt Lake City, UT 84112

E-mail: Adrienne.cachelin@utah.edu