

## Sustainability for Secular and Spiritual Groups: A Framework from University and Community Education

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### ABSTRACT

Education around the concept of sustainability, encompassing the environment, economy, and society, presents challenges of context among diverse groups. I present a framework for sustainability education based on experience with educating secular groups in a university context and educating spiritual groups in a community context. This sustainability education framework highlights three drivers for student learning: passion, experience, and uncertainty. Examples from education of secular and spiritual groups illustrate the importance of projects, challenges, and dialogue. Sustainability education can reveal common ground between science and religion.

*Keywords:* sustainability, university education, community education, science and religion

### Editors' Comment

*Ashlynn S. Stillwell, Ph.D., (2017-2019 Fellow) is an Associate Professor and the Elaine F. and William J. Hall Excellence Faculty Scholar in Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign. In this article, she shares a framework for sustainable education that is suited for both secular and spiritual groups. Considering the existential threat of climate change, along with the growing scientific skepticism among religious groups, there has never been a greater need for effective education for sustainability. Her focus on passion, experience, and uncertainty provides a different perspective on how science educators can connect with students.*

### Introduction

The concept of sustainability has become an important part of STEM education; however, defining sustainability remains as a challenge that depends on the context within which a system resides. We often understand when one approach or solution is more or less sustainable than another, yet we cannot quantify sustainability objectively on its own. Consequently, teaching sustainability requires more than a mathematical formulation or a balanced chemical reaction. Sustainability education includes both the traditional classroom and the broader community, encompassing both secular and spiritual aspects of learning (Ashford, 2004; Bielefeldt, 2013; Chuvieco, 2012; Crossman, 2011; Podger et al., 2010). Here, I present a framework for sustainability education based on my experience teaching both secular and spiritual groups. Building on this experience, I draw connections between university-level engineering education and faith community education on sustainability topics, situated in the broader dialogue between science and religion.

### **Background: Conceptualizing Sustainability**

Sustainability is often represented as a transition or a process, with many literature references describing an uncertain journey towards a future goal (Clark & Dickson, 2003; Kates et al., 2001; NRC, 2013; Parris & Kates, 2003). Beyond this transition, definitions of sustainability typically focus on interlocking crises based on the three pillars (or “broad areas of concern” as originally labeled in the Brundtland et al. (1987) report) of environment, economy, and society. Many sustainability definitions also include language to promote positive change rather than simply minimizing negative impacts (Dovers, 1996; Kemp & Martens, 2007; Kemp et al., 2005; Marshall & Toffel, 2005; Pope et al., 2004; Sexton & Linder, 2014; Spangenberg, 2011; Swart et al., 2004).

Of the three pillars of sustainability (environment, economy, society), the social elements of sustainability often receive the least attention. Vallance et al. (2011) presented a typology for social sustainability including *development sustainability* (addressing basic human needs), *bridge sustainability* (promoting changes in human behavior), and *maintenance sustainability* (preserving socio-cultural characteristics). In focusing on human behavior, bridge sustainability in particular can enable a transition to advance sustainability goals through an environmental ethics lens. Vallance et al. (2011) label these behavior changes as *non-transformative* approaches of simply learning about sustainability actions versus *transformative* approaches that actually change the relationship between humans and the environment. Enabling transformative behavior requires education, both formal and informal, and knowledge regarding sustainability and the likely outcomes from one’s actions.

Both individual and collective actions are necessary to achieve sustainability goals, including local challenges, such as renewable energy or alternative water supply investments, and the global challenge of climate change. Effective climate mitigation and adaptation depends on both personal actions and policy approaches (Attari et al., 2019). In faith communities, the religion-environment connection is relevant for personal behavior, including ways of living and ethical or moral values (Chuvienco, 2012), and many religions include aspects of sustainability in faith beliefs and practices. Consequently, the whole-person approach to educating for sustainability, based on an example of Baha’i faith-inspired service learning, can have more benefits than traditional behavioral education approaches (Podger et al., 2010). Research on business practices has illustrated the synergies between spiritual and environmental leadership (Crossman, 2011), and these synergies can also be relevant in an educational setting in preparation for the workforce and/or as continuing education. Formal and informal sustainability education has a role to play in informing personal actions and forming the knowledge base for policy and governance approaches.

### **A Framework for Sustainability Education**

Sustainability is an inherently interdisciplinary subject such that no one single pedagogical approach or education framework encompasses the whole of the concept. The following sustainability education framework is based on my experience in higher education teaching students in Civil and Environmental Engineering and my experience sharing sustainability and environmental concepts with faith communities through Faith in Place ([www.faithinplace.org](http://www.faithinplace.org)), a non-profit organization that connects people of faith around care for the environment and the Illinois affiliate of Interfaith Power and Light. Here, I refer to student learning in general, where ‘student’ includes individuals from both of these groups.

Sustainability in these two contexts, secular and spiritual groups, encompasses different characteristics of STEM education. Formal sustainability education in the context of a university classroom is often focused on knowledge acquisition, concept mastery, skills development, and workforce preparation. On the other hand, informal sustainability education in the context of spiritual groups tends to focus on translating knowledge to individual and collective action for the broader

societal good. However, these secular and spiritual contexts are not necessarily in conflict; both contexts offer perspective for effective sustainability education.

I formulate this sustainability education framework from my own perspective (Figure 1) around three drivers of student learning in the context of sustainability: passion, experience, and uncertainty.

**Figure 1**

*A Proposed Framework for Sustainable Education*

<b>Sustainability Education</b>		
<b>Passion</b>	<b>Experience</b>	<b>Uncertainty</b>
<ul style="list-style-type: none"> <li>• Understanding problem context</li> <li>• Intrinsic motivation</li> </ul>	<ul style="list-style-type: none"> <li>• Critical analysis</li> <li>• Systems thinking</li> <li>• Formulating and testing solutions</li> </ul>	<ul style="list-style-type: none"> <li>• Quantifying tradeoffs and externalities</li> <li>• Decision making</li> </ul>

### **Passion**

While a large portion of sustainability builds on math and science fundamentals, passion and attitude are arguably a more important foundation for learning success. When a student has passion for sustainability-related topics, they often are intrinsically motivated to learn more about problems and possible solutions. Passion can also lead the student to conduct their own research to more fully understand the particular sustainability problem of interest and the broader context, moving toward *understanding* in Bloom's taxonomy.

### **Experience**

Through direct experience with sustainability problems, students develop a core knowledge base around sustainability concepts. This problem-based learning can help students leverage passions to investigate sustainability problems deeper. Sustainability experience can come from critical analysis of a problem, using systems thinking approaches that quantify and evaluate interconnections and feedbacks between systems. With critical analysis and systems thinking tools, students can formulate and test solutions, simulating different states of the world and possible outcomes. This experiential, problem-based learning moves toward *analyzing* and *evaluating* in Bloom's taxonomy.

### **Uncertainty**

The wicked problems in the context of sustainability typically have no 'right' answer, though there might be several 'wrong' answers. The non-deterministic nature of sustainability leads to significant uncertainty regarding systems, inputs, outputs, and results. Through deeper consideration of uncertainty, students learn to quantify tradeoffs and externalities associated with a simulated solution. Across the three pillars of sustainability, tradeoffs are inevitable such that the 'right' answer depends on context, and problem-specific conditions. Learning to make decisions under uncertainty is an aspect of sustainability education that can deepen learning mastery and support further analysis, moving toward the goal of *creating* new or original work in Bloom's taxonomy.

### **Sustainability Education in a Secular University Context**

My experience in formal sustainability education is in the context of Civil and Environmental Engineering at a secular university. In one of my classes, Energy and Global Environment, undergraduate students learn the fundamentals of energy and environmental systems by evaluating multiple impacts of engineering decisions.

Many Civil and Environmental Engineering students already have a passion for sustainability and sustainable development. Engineering education regarding sustainable development often focuses on teaching students the skills necessary to successfully initiate change processes (Fenner et al., 2005), particularly systems change (Ashford, 2004) and bridging across fields. However, this bridge across fields can be perceived as trading off depth for breadth in the knowledge base. While aiming for both depth and breadth in engineering education, Ashford (2004, p. 239) comments on fragmentation in the engineering knowledge base, “leading to myopic understanding of fundamental problems.” Essentially, engineering students with passion for sustainability might find that branching out into diverse and broad topics leads to less depth of technical knowledge in core areas, which then undermines the breadth of education also.

This depth-for-breadth tradeoff can be mitigated through experiential education (Bielefeldt, 2013), using immersive, authentic experiences in the educational approach to support students in critical analyses and actionable science. In my class, students learn to evaluate impacts of engineering systems through two projects: the first rigid in structure but flexible in location, and the second open-ended in subject matter. For example, the structured project focuses on selecting the most appropriate walling material for constructing housing in low-income countries. This ‘most appropriate’ walling material decision is based on total cost (including labor and materials), transportation energy, materials embodied energy, water consumption, air emissions, and health risks, all quantified for a student-selected low-income country location, where data are often scarce. Though every group in the class is examining the same basic question (i.e., What is the best walling material?), recommended solutions often vary widely due to the country-specific context and relevant environmental, economic, and social factors.

Leveraging the knowledge and skills gained from the first structured project, students then complete a second open-ended project comparing two infrastructure systems, with ‘infrastructure’ broadly defined. In this student-led, open-ended project, groups often form around topics of interest and passion on diverse subjects. Previous projects have evaluated commuter rail vs. ferries, conventional vs. green roofs, nuclear vs. renewable energy, omnivorous vs. vegan diets, and many other systems. While students often go into their projects with initial thoughts regarding the ‘best’ system, tradeoffs and externalities almost always emerge such that the ‘best’ system is not immediately obvious and requires consideration of context, uncertainties, and priorities. Those uncertainties extend beyond purely mathematical uncertainty quantification to include uncertainty in prioritizing environmental needs over societal needs, for example. Students often come to the same conclusion as Peter (1982) in his popular quote, “Some problems are so complex that you have to be highly intelligent and well informed just to be undecided about them.”

### **Sustainability Education in a Faith Community Context**

My experience in informal sustainability education has been in the context of Faith in Place through outreach and engagement with Green Teams at houses of worship. These Green Teams, composed of adults of many diverse faiths, come together at the Annual Green Team Summit, with opportunities for education and exchange of ideas and experiences.

Faith communities often have unique perspectives regarding sustainability. In Judeo-Christian contexts, for example, the competing themes of dominion over versus stewardship of the Earth

emerge as attitudes toward the environment (Konisky, 2018). Despite Pope Francis's encyclical *Laudato Si': On Care for our Common Home*, there is little evidence of a "greening" of Christianity with increased concern for the environment. In analyzing longitudinal data, Konisky (2018) showed that some evidence suggests Christians have less concern for the environment over time. However, in a study of social identity and in-group norms of Christians, framing around stewardship led to significant increases in pro-environmental and climate change beliefs (Goldberg et al., 2019). Consequently, linking faith and beliefs with concern for the environment in spiritual groups can ignite passion for sustainability.

Process cues from clergy and academic experts can affect trust and attitudinal ambivalence (Djupe & Calfano, 2009), such that faith communities and their leaders can play a significant role in beliefs and actions around sustainability. Linking spiritual beliefs with sustainability can support personal action and experience around care for the environment. For example, one of Faith in Place's core programs is Sustainable Food & Land Use, emphasizing the combined challenges of shrinking native landscapes and growing hunger and inaccessibility of healthy food options. Through the Just Eating curriculum revision, Faith in Place staff and volunteers created material to emphasize the cultural importance of food, highlight the challenges of hunger and healthy food inaccessibility, and foster dialogue around possible solutions. This material was presented at the 2019 Faith in Place Green Team Summit. Each lesson of the 'Revisiting Just Eating' curriculum includes an experiential element, such as keeping a food diary or preparing a meal using only ingredients from a convenience store, with a follow-up reflection. These learning-by-doing approaches help illuminate the context around food systems sustainability challenges.

In response to different values, experiences, and contexts related to food and faith, many participants in the 'Revisiting Just Eating' discussion expressed uncertainty regarding solutions. This uncertainty included acknowledging tradeoffs between affordability and nutrition, inequality around access to fresh produce, the role of food in religious observances (e.g., Jewish Passover Seder), and different resource contexts for constructing community- or congregationally-supported agriculture farms. Despite uncertainties regarding solutions, people of faith did come together in the context of sustainable food and land use, linking environmental and systems science and religion around care of the Earth and the humans inhabiting it.

### **Discussion: Sustainability in the Broader Science-Religion Dialogue**

In the context of sustainability, we have entered the Anthropocene era, where humans and the Earth are "intertwined, so that the fate of one determines the fate of the other" (Zalasiewicz et al., 2010, p. 2231). A similar concept arises in Buddhism, that of *interdependent co-arising*, where "things which may seem to exist independently of other things are in fact dependent for their existence and their character on other things" (Wright, 2017, p. 202). This intimate linkage between humans and the environment is relevant in the context of both sustainability science and religion. Advances in science and engineering can enable advances in Earth ethics (Schmidt & Peppard, 2014); for example, quantifying groundwater depletion via the Gravity Recovery and Climate Experiment (GRACE) satellites (Richey et al., 2015) can support more sustainable groundwater extraction and consumption.

Sustainability is often defined as meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (Bruntland et al., 1987, p. 15 paragraph 3), which can resonate with both spiritual and secular individuals. In their survey studying reasons to reduce climate change, Goldberg et al. (2019) found the most important reason selected was "Provide a better life for our children and grandchildren," selected by 28% of Americans and 29% of Christians surveyed. Acknowledgement and care for future generations through care and action for the environment illustrates synergies between science and religion in practice. Moving forward, sustainability education and sustainable development require learning, dialogue, and action around

common goals. While science and religion are often viewed in conflict, sustainability presents a common ground. As Archbishop Emeritus Desmond Tutu once said, “We have enough that conspires to separate us; let us celebrate that which unites us, that which we share in common” (Tutu, 2011, p. 7).

Sustainability is a broad concept encompassing the environment, economy, and society, and it presents challenges in education through tradeoffs between breadth and depth of knowledge. The intersection of and dialogue between science and religion presents an opportunity to reach diverse groups with sustainability education, leveraging passion and experience to inform decisions and positive action amidst uncertainty. Experiential learning in both university and community settings can deepen knowledge and emphasize sustainability concepts through projects, challenges, and dialogue, and that learning through the whole-person approach to educating for sustainability (Podger et al., 2010) can lead to greater benefits overall. This figurative common ground of sustainability education can help inspire action to protect the literal common ground of Earth.

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