

The Essential Elements of Education for Sustainability (EfS) Editorial Introduction from the Guest Editor

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Jaimie is a thought leader in the field of Education for Sustainability. She has authored The Cloud Institute's EfS Framework, and several peer-reviewed journal chapters and articles on Sustainability and the significance of Education for Sustainability. Jaimie works extensively with educators, administrators, and school boards across the nation. She designs and facilitates professional development programs and directs the collaborative development of numerous instructional units and courses for K-12 and Higher Education designed to teach and learn across disciplines through the lens of sustainability. In addition to her commitment to furthering the mission of The Cloud Institute, Jaimie serves as an advisor, board member or committee member to several organizations with related goals and interests.

“The test of a first-rate intelligence is the ability to hold two opposing ideas in mind at the same time and still retain the ability to function. One should, for example, be able to see that things are hopeless yet be determined to make them otherwise.”

F. Scott Fitzgerald

This first section of the introduction was co-authored by Kirk Bergstrom (Worldlink) and Jaimie Cloud as part of their work to create a Community of Practice for the field of Education for Sustainability.

Introduction

The unique challenges that define our era—reversing global climate change, protecting biodiversity, restoring the health of our oceans, developing sustainable food systems, accelerating the shift toward clean, renewable energy—require fundamentally new ways of thinking and acting (Capra, 2007; Rockström, 2009; AAAS, 2001; Barstow & Geary, 2002; Larson, 2011; NRC, 2012; NOAA, 2005 and 2009). Our species’ endeavor to achieve a sustainable human future invites reflection on the fundamental question: Education for what purpose? (Orr, 1991 and 2004; Sterling 2001). If humanity is to successfully transition from an unsustainable way of life to a regenerative one, the field of Education for Sustainability (EfS) has a central role to play (Wheeler and Byrne, 2004; DOE, 2011; Assadourian and Renner, 2012; Sterling, 2001; Senge, et al., 2008 and 2012).

Education for Sustainability functions as a powerful rationale for teaching and learning in the 21st Century (Sterling, 2001; Wheeler and Byrne, 2004; Cloud, 2010). It is a “whole system of inquiry” that combines current best practices of teaching and learning with the content, core competencies, and habits of mind required for students to actively participate in creating a sustainable future (Bergstrom, 2009; Cloud, 2010; ESA, 2012). It can be defined as a transformative learning process that equips students, teachers, schools, and informal educators with the knowledge and ways of thinking that society needs to achieve economic prosperity and responsible citizenship while restoring the health of the living systems upon which our lives depend (Cloud, 2004 and 2010).

Education for Sustainability explicitly recognizes the role of teaching and learning in shaping the future we want. In this context, sustainability is viewed as a preferred condition: “A society that is far-seeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems of support” (Meadows, 1992), “a quality of life for all within the means of nature” (Wackernagel, 1995), “the long-term integrity of the biosphere and human well-being” (Chapin et al, 2011), and “The possibility that human and other life will flourish on Earth forever” (Ehrenfeld, 2008).

From a theoretical standpoint, Education for Sustainability draws on multiple teaching and learning methodologies. These include backwards design, best known as “Understanding by Design (UBD)” (McTighe and Wiggins, 2004), curriculum mapping tools (Jacobs, 2004), learner centered/assessment driven instruction (Martin-Kniep, 2009), project-based learning (Buck Institute, 2003), inquiry-based learning (Bruner, 1996), constructivist learning (Von Glasersfeld, 1995), and professional learning communities (DeFore and Eaker, 1998). EfS provides teachers and learners with an inspiring mission—to participate in creating a sustainable future—and pedagogical and content pathways that support whole systems thinking and design. This truly represents one of the “grand challenges” of our time.

Key research informing an EfS theory of change includes, Organizational Learning and Change (Senge), System Dynamics and Systems Thinking (Von Bertalanffy, Ackoff, Capra, Forester), the Innovation Diffusion Theory (Rogers), and Otto Scharmer's Theory U.

EfS recognizes the essential role that interdisciplinary and cross-sector collaboration play in fostering innovation (Beinhocker, 2006). Education for sustainability is inherently transdisciplinary (NSF SEES, 2012). It assumes that comprehensive, anticipatory design solutions (Gabel, 2012) are required for systemic change. Robert Kates, author of *What Kind of Science is Sustainability Science?*, writes that "sustainability science is a different kind of science . . . with significant fundamental and applied knowledge components, and a commitment to moving such knowledge into societal action (Kates, 2011). Among the many disciplines and fields that inform EfS are:

Science: adaptive systems, biology, Earth system science, ecology, environmental science, game theory, global environmental change, green chemistry, neuroscience, oceanography, , physics, resilience science.

Engineering & Design: biomimicry, cradle-to-cradle design and manufacturing, ecological design and architecture, life cycle analysis with full cost accounting, and sustainable communities design.

Education: climate literacy, ecological literacy, environmental education, design thinking, futures studies, holistic education, gaming to learn, geospatial literacy, global education, holistic education, mindfulness education, oceans literacy, place-based education, social emotional learning, systems thinking, and win-win conflict resolution education.

Social Science & Humanities: creativity and the arts, ecological psychology, ethics, history and environmental history, philosophy, positive psychology, and the science of happiness.

Currently, there is a large gap between society's aspirations for a healthy and sustainable future, and the knowledge, skills, and attitudes being taught and acquired in the majority of Pre-K-12 schools. A long-term goal of the field of Education for Sustainability is to demonstrate the unique value of sustainability as a context for the whole school and curriculum (Stone, 2010), and for the larger community (Sobel, 2004; OFSTED, 2009; Journal of Sustainability Education, 2011). Research designed to measure the impact of EfS on students, schools and communities should, among other important outcomes, demonstrate that there is a correlation between the practice of EfS (sustained, comprehensive EfS in day-to-day actions of community members and explicit instruction), and the achievement of communities as measured by sustainable community indicators.

Recent research analyzing the effect of EfS programs on students, teachers, and communities shows multiple, positive and lasting benefits (Becker-Klein et al, 2008; Duffin, 2006; AED/Cloud, 2007; Sobel, 2008; Gayford, 2009; Barrat Hacking et al, 2010; PEER Associates, 2010). The data indicates:

EfS Effect on Students:

- Improves student learning and standards achievement
- Enhances attitudes towards learning
- Produces better behavior and attendance
- Aligns with people's natural ability to learn holistically
- Significantly decreases students' feeling that they cannot succeed
- Encourages students to make connections between themselves and the systems of which they are a part.
- Develops a greater awareness of community, and a greater appreciation of the democratic process

- Produces statistically significant increases in the strength of students' attitudes about civic engagement
- Provides a safe and secure space in which children can take risks and develop skills of active participation

Efs Effect on Teachers:

- Supports both new and veteran teachers in achieving strong academic outcomes from their students
- Yields meaningful effects on teacher attitudes

Efs Effect on Community

- Improves whole school cultures
- Fosters meaningful relationships between the school, parents and the community
- Improves children's health by improving their food choices
- Models actions and attitudes that promote sustainable living
- Improves air quality, reduces waste, decreases energy and water use

As the Education for a Sustainable and Secure Future Report (NCSE, 2003) states: "Human and global security, economic opportunity, and the quality of life for humans and all species depends upon the continued availability of a life-sustaining environment." Pre-K-12 Education for Sustainability is uniquely positioned to help address the challenges of environmental, social, and economic sustainability through sustained innovation in teaching and learning.

With this special issue of the Journal of Sustainability Education, the editorial team would like to catalyze, energize and advance the field of Efs from a community of interest to a community of practice (Wenger, 2006):

- **An Efs Communities of Interest** is characterized by pockets of innovation; a need for shared meanings and understandings; limited opportunities for coordinated research and exchange, and a need for more formal structures to grow the field.
- **An Efs Community of Inquiry** is characterized by connecting pockets of research and innovation; promoting interdisciplinary and cross-sector collaboration; defining strategic opportunities, and documenting success stories.
- **An Efs Community of Practice** is characterized by regular opportunities for people to share research and practice; a body of research and literature; formal and informal structures for communications and meetings; and connecting to related networks for the dissemination of knowledge.

Within a community of practice, members make "a commitment to be available to each other, to offer support to share learning, to consciously develop new knowledge. They are there not only for their own needs, but for the needs of others" (Wheatley, 2005). The focus of a community of practice also extends

beyond its membership to advance its field and share discoveries with others engaged in similar work (Barlow and Stone, 2011).*

The Journal of Sustainability Education is very proud to welcome you to the first in a series of three issues entitled, Sustainability Education: The State of the Field. Our Editorial team designed this series for one purpose: to create a series of benchmarks for Sustainability Education. To accomplish this goal, we asked thought leaders and scholars who have created and continue to study EfS to address the following questions: What is Education for Sustainability (EfS)? What are the “essential ingredients” of EfS that distinguish it from other educational frameworks? What paradigms, knowledge, skills and attitudes characterize EfS? What instructional and engagement practices are congruent? What are the favorable organizational conditions that will make it possible? What types of school/community partnerships are key?

As you peruse our database, of thought leaders’ and scholars’ contributions of Sustainability Education “ingredients”, you will likely see that the authors have different passions and rationales for being engaged in EfS, and different roles, responsibilities and backgrounds, yet we have at least one thing in common: We know that all people have to *learn* how to live well within the means of nature on Spaceship Earth.

You will also see that some authors have spent decades drilling down deeply into one aspect of Sustainability Education, while others have worked to conceptualize the whole system of EfS. Some have focused on content for one or two categories in our database template, and some have contributed material in all the categories. We have combined all grade levels here as a starting point—before we attempt over time to determine the developmental appropriateness of the different aspects of EfS for different age groups (although some of us have already begun to do that in our own work driven by the markets we serve). You can sort the data by author and by category and you are invited to compare and contrast the thinking represented here. Remember, the overarching question is “What is essential to Education for Sustainability?”

Why develop benchmarks for EfS? Every legitimate field of inquiry has to define itself and re-define itself over time. If it doesn’t, someone else will, it will disappear, or worst of all become distorted. A field of inquiry has to establish boundaries for the system of interconnected elements with which it is concerned, and it has to set and re-set the bars of excellence so that those who want to study it, deliver it and assess for it can aspire to the highest degrees of readiness and quality. . For years, many countries from around the world have been examining the attributes of EfS/ESD (Education for Sustainable Development as it is often called around the world) through their federal-level education systems, in Colleges and Universities in general, and Schools of Education in particular. Here in the U.S. a handful of dedicated thought leaders and scholars, in both NGOs and universities, have studied the historical antecedents (Bateson, Fuller, Leopold to name just a very few) from around the country and the globe, in order to create multiple EfS frameworks articulated from their own perspectives. This has made the work rich, robust and relevant for our context. In this Journal issue, we have come together with colleagues from around the world to share, for the first time, our collected works in one place and to put it forth for vigorous examination. The ultimate goal is to synthesize “the State of the Field” and determine what we all agree is essential to educating for a healthy and sustainable—even regenerative future. We all know that our individual work will be altered through this process--this is inevitable if we are humble and open minded. We welcome the evolution of our thinking into a whole system of which we can all be proud and behind which we all can stand.

This brings me to a **brief discussion of the 2nd issue** in the series. Fourteen years into the 21st Century, educators and decision makers on the ground must be able to trust that what they are doing, and what they are receiving in the way of assistance, meets the industry standards for EfS. In order for that to happen, we need to have *agreed upon* industry standards or “standards of excellence” for EfS. In the 2nd issue of the series, a core group of the thought leaders and scholars and a group of emerging scholars will come together to conduct a meta-analysis of our collective body of work with the goal of developing industry standards for EfS. These standards, which should come to represent the whole of our collective thinking to date, will be used by school administrators and Board members, text book publishers, parents, faculty, students and the community at large so that they can assess the extent to which their institutions are educating for a sustainable future, and to what extent they are meeting those industry standards. More importantly, these benchmarks can help us to produce and distribute the highest quality EfS programs, curricula and learning experiences, intentionally designed to accelerate the shift toward a healthy and sustainable future.

A heads up regarding the 3rd issue: For the 3rd issue in the series, we will invite educators worldwide to submit exemplars of curriculum units, courses, assessments, rubrics and other forms of explicit performance criteria, as well as student work samples (with aligned performance criteria) that meet the EfS Standards of Excellence that emerge from the meta analysis published in the 2nd issue.

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