
Education for Sustainability

Accelerating the Transition to Sustainability Through Higher Education

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Envisioning a Sustainable Future

Let us imagine... a society in which all present and future humans are healthy and have their basic needs met. What if everyone had fair and equitable access to the Earth's resources, a decent quality of life, and celebrated cultural diversity. Imagine all people realizing their highest aspirations and restoring and preserving the biologically diverse ecosystems on which we all depend. Imagine future scientists, engineers and business people designing technology and economic activities that sustain rather than degrade the natural environment, that enhance human health and well-being, and that mimic and live within the limits of natural systems. Imagine a future where we design our technology inspired by biological models by operating on renewable energy; where the concept of "waste" is eliminated because every waste product is a raw material or nutrient for another species or activity, or is returned into the cycles of nature. Imagine that we are managing human activities in a way that **increases** biological diversity and complexity.

Imagine all professionals understand their connections to the natural world and to other humans, knowing where products and services come from, knowing where wastes go, and knowing what they do to humans and other living species and how to minimize this *ecological footprint*. Our ecological footprint (our impact on the Earth) is invisible to most of us. We must make the invisible visible. The average person does not know that for every 100 lbs. of product produced in the United States, we actually move 3,200 lbs. of material and energy, most of which go to waste before we ever see the product or the service.

Imagine that we have stabilized the population at a level that is within the

carrying capacity of Earth's ecosystems because we have increased the education as well as the social and economic status of women. Imagine that we have timely and accurate economic and ecological signals: micro-economic signals for price that reflect the true social and environmental cost to society; macro-economic indicators that reflect the true well-being of society and the Earth; and ecological signals that we receive in time to prevent or remedy damage to humans or the environment.

Now imagine that all current and future generations are able to pursue meaningful work and have the opportunity to realize their full human potential both personally and socially. Imagine that through our "dreaming" and "doing", we have dramatically reduced resource consumption, pollution and waste in the developed world so that there is opportunity in the developing world to be healthy and have a decent quality of life. Imagine that communities are strong and vibrant because they celebrate cultural diversity, are designed to encourage collaboration and participation in governance and emphasize the quality of life over the consumption of stuff. Think what it could be like if globalization is humanized to support democracy, human rights and economic opportunity for everyone.

"...Imagine all professionals understand their connections to the natural world and to other humans..."

How do we create this future? This will require a huge shift in thinking, values and action. To paraphrase Einstein, "The significant problems we face cannot be solved by the same level of thinking we used when we created them." We must reinvent the world socially, economically and environmentally. In effect, we must decouple social and economic progress from environmental deterioration — or, as Bill McDonough says, "We must take the filters out of the pipes and put the filters in our minds."

Does this describe an unattainable utopia? No. It is possible because of the thousands of things that are being done, by progressive groups in civil society, philanthropy, universities, major industries, governments and communities around the world today.

"We must make the invisible visible."

Higher Education's Role

The change in mindset necessary to achieve this vision is a sustained, long-term effort to transform education at all levels. Despite the efforts of many individuals and organizations, education for a just and sustainable world is not a priority in formal education. Indeed, through an emphasis on the separation of humans from the rest of nature, through compartmentalized learning, individual specialization and success, and the absence of explicit ethics and values in learning, the predominant educational model is reinforcing the current inequitable and unsustainable worldview. As David Orr has said, "The crisis we face is one of mind, perception and heart... It is not a problem in education; it is a problem of education."

Higher education plays a profound and pivotal, but often overlooked, role in making this vision a reality. It prepares most of the professionals who develop, lead, manage, teach, work in and influence society's institutions, including K-12 education. Besides training future teachers, higher education strongly influences the learning framework of K-12 education. Higher education plays a critical role in creating and disseminating the knowledge, skills and values for society. Moreover, higher education has unique academic freedom and the critical mass and diversity of skill to develop new ideas; to comment on society and its challenges; and to engage in bold experimentation in sustainable living.

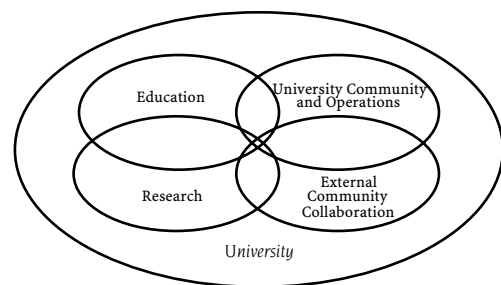
In addition, higher education is a large economic engine. There are 4,100 higher education institutions in the United States—community colleges, universities, colleges and professional schools—with a total of 14.6 million students. The annual operational budgets of those institutions is \$200 billion—greater than the GDP of all but twenty countries in the world. Their endowment is over \$230 billion.

"The significant problems we face cannot be solved by the same level of thinking we used when we created them."

Imagine if the universities were modeling sustainability by purchasing environmentally friendly products. And imagine the leverage if universities were utilizing the faculty and students to conduct the research to help them make those decisions. Graduating students would have the knowledge and values to demand environmentally-friendly products and services and know how to help business create them.

Education for the Twenty-first Century

What if higher education were to take a leadership role, as it did in the space race and the war on cancer, in preparing students and providing the information and knowledge to achieve a just and sustainable society? What would higher education look like? The education of all professionals would reflect a new approach to learning and practice. The university would operate as a fully integrated community that models social and biological sustainability itself and in its interdependence with the local, regional and global community. In many cases, we think of teaching, research, operations and relations with local communities as separate activities; they are not. Because students learn from everything around them, everyone with whom they interact and everything they do, these activities form a linked and interdependent web of the students' learning experience.



Universities Modeling Sustainability as a Fully Integrated System

Imagine if, in the twenty-first century, the educational experience of all students is aligned with the principles of sustainability. The content of learning would embrace interdisciplinary systems thinking to address

environmentally sustainable action on local, regional and global scales over short-, medium- and inter-generational time periods. Education would have the same "lateral rigor" across the disciplines as the "vertical rigor" within the disciplines. Compartmentalized knowledge without connection to larger system interactions results in viewing many interdependent challenges—such as population, consumption, economic, health and the environment—as separate and often competing. The net results are often narrow, ineffective solutions, or worse, more harmful to people and the environment in another place or another time. Systems thinking is essential to developing a shared framework for understanding and dealing with complex nonlinear systems that are characteristic of society and the natural world.

"...The learning experience for students should include working on actual, real-world problems facing communities, government and industry."

The context of learning would change to make the human/environment interdependence and values and ethics a central part of teaching in all the disciplines, rather than isolated as a special course or module in programs for specialists. All students would understand that we are an integral part of nature. They would understand the ecological services that are critical for human existence and how to assess and minimize the ecological footprint of human activity. For example, in order to reflect human/environment interdependence, the teaching of all chemistry courses would include attendant dangers to human health and the environment of chemical processes and development of safe and sustainable processes that are also profitable.

The process of education would emphasize active, experiential learning and real-world problem solving on the campus and in the larger community. For example, as part of the curriculum, the learning experience for students should include working on actual, real-world problems facing communities, government and industry. It would also increase group work and learning so students will be able to effectively collaborate as future managers and leaders on complex problems.

"We must take the filters out of the pipes and put the filters in our minds."

To take us one step closer to our ideal, higher education would "practice what it preaches" and make sustainability an integral part of operations, purchasing and investments, and tie these efforts to the formal curriculum. The university is a microcosm of the larger community and a large economic engine as indicated above. Therefore, the manner in which it carries out its daily activities is an important demonstration of ways to achieve environmentally responsible living and to reinforce desired values and behaviors in the whole community. By focusing on itself, the university can engage students in understanding the "institutional metabolism" and ecological footprint of materials and activities. Students can learn how to minimize their ecological footprint and develop the critical thinking and collaborative work skills necessary for personal and societal fulfillment and success.

To take us to the next step, think of the impact of higher education forming partnerships with local and regional communities to help make them socially vibrant, economically secure and environmentally sustainable. When they graduate, the students would be able to enter the larger world with knowledge, skills and values of sustainability to their future employment, consumption decisions, lifestyle choices, and to the improvement of communities in which they live.

Catalyzing the Transformation of Higher Education

Can higher education help make the transition to a sustainable path within the twenty to forty year time frame that has been called for by the United Nations, many scientists and other prominent leaders? This is a tall order. Higher education is one of the most conservative institutional sectors in society. What we are advocating is a deep cultural change—the only kind of change that will result in a paradigm shift and make just and sustainable living "second nature." Only a vigorous, sustained and tenacious effort by many of higher education's internal and external stakeholders can make this happen.

Strong, rapid and largely unprecedented efforts by all of higher education's stakeholders are necessary to help move the higher education system on a path to sustainability. Students, parents, alumni, prospective employers, organizations funding research and education (government, industry and foundations), accrediting organizations and the public must work with the higher education system in creative ways to encourage education and research for sustainability. There is a growing student demand at colleges and universities in the United States and internationally for environmental education and for institutions to reduce the environmental impact of their own operations. This effort must be encouraged and expanded. Both directly and through hiring practices, prospective private employers could expand efforts to communicate with higher education about the need for both specialists and graduates in all fields that have the knowledge, skills and values to help them build sustainable businesses.

Second Nature and several other nonprofit organizations* are dedicated to creating the transformation of higher education envisioned in this article. Most recently, these organizations and dozens of academic leaders have acted to create a new national network, called the Higher Education Network for Sustainability and the Environment (HENSE). Its purpose is to connect the efforts across the country in ways that create synergy and a critical mass of people to rapidly accelerate education for sustainability. Private and public philanthropy should seek high leverage opportunities like the transformation of higher education and fund the long term infrastructure of those change agents inside and outside the system that can have the greatest impact. This will require the philanthropic world to have the patience and work in partnership with these change agents for a sustained period to effect the long-term cultural change necessary.

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Second Nature (www.secondnature.org), a nonprofit organization, is part of growing national and international efforts to accelerate this transformation. Over the past seven years, Second Nature has provided training, technical assistance and educational resources to several thousand faculty and administrators at more than 250 colleges and universities affecting curriculum, operational and administrative change to embrace sustainability.

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- Center for Respect of Life and the Environment:
[http:// www.crle.org](http://www.crle.org)
- Higher Education Network for Sustainability and the Environment
<http://www.hense.org>
- National Wildlife Federation Campus Ecology Program:
<http://www.nwf.org/campus>
- University Leaders for a Sustainable Future:
www.ulsf.org
- World Resources Institute Management Institute for Environment and Business:
www.igc.org/wri/meb