EDUCATION FOR SUSTAINABILITY

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Summary

Man, above everything else, is an educated animal, socially controlled.

(H. G. Wells)

Education, in one form or other, is essential to the evolution and well being of humanity and the earth. Now, more than ever, education, in its many forms and levels, is endeavoring to meet the environmental challenges of the contemporary moment. The fate of humanity's continued survival is dependent on the adaptation of all human beings to conditions of life needed for a secure, just, and equitable world. These conditions are inextricably interconnected with earth's life support systems: their continued existence and their maximum sustainable use by *Homo sapiens*. Today, throughout a world fraught with danger and possibility, educational systems are currently trying to respond to these challenges by promoting awareness, understanding, and action related to the environment and sustainability. Results have been mixed. While educational systems have endeavored to offer environmental education courses and programs, and have endeavored to integrate the concept of sustainable development into environmental and social understanding, there remains considerable disagreement as to the seriousness of the ecological and environmental issues facing humankind. Indeed, changing the instruction and curriculum of educational systems so they emphasize sustainability—which clearly means the rethinking of such concepts as materialism, consumerism, and development—may clash with the political economy within which educational systems are embedded. Thus, universal acceptance of a social vision that embraces sustainability as a guiding educational standard remains in the distant future. Advocates continue to press forward, however, in their increasingly vocal

support of education for sustainability. The breadth of this continuing and evolving response is the topic of this theme article.

The aim of this essay is to guide you through changing developments in education and sustainability in order to help clarify the movement and momentum towards more sustainable futures. It also serves as an introduction to the five-part theme on "Education for Sustainability" in the *Encyclopedia of Life Support Systems* (EOLSS). The following essay is divided into six parts. The first section will introduce the reader to the contentious nature of the concept "education for sustainability," both in its whole and its parts. The meanings and motivations supporting this concept are under constant pressures for reinterpretation and clarification. However, as the information in the second section suggests, there is an ecological imperative flowing from the knowledge of natural and social sciences that is challenging humanity to recognize the finite nature of earth: an earth that is inordinately pressured by the needs and wants of our species. Education and the raising of human consciousness are among the most viable ways of recognizing this ultimate challenge, but modern schooling, the primary source of literacy and advanced understanding in much of the world, reinforces ideas and values that are often barriers to the kind of thinking needed to achieve sustainable futures for human diversity and for the diversity of all life. These barriers and obstacles to an ecological, sustainable vision are the subjects of the third section of this essay. Schooling more than ever is essential in the globalization of a world economy and in the preparation of workers for such an economy. This economy, with its focus on free trade, increasing consumption, and production, perpetuates classical attitudes towards growth and development to improve the human condition. The resulting modern lifestyle with its emphasis on quantitative growth and development is the root challenge to living a more sustainable lifestyle on the earth. In the fourth section, we see that education for sustainability has been accepted by many as a way both to contain current excesses in consumption and production and to encourage a more equitable and just world. Advocates of this vision see it as an ideology that needs to affect the acculturation and education of all humanity in order to assure sustainable futures. The following section introduces the reader to the growing momentum for cultural and educational change implicit in the numerous activities that encourage education for sustainability in schools and universities throughout the world. Finally, the last section of the essay introduces the reader to the content and structure of the theme "Education for Sustainability" in the EOLSS.

1. Introduction: Education for Sustainability

Efforts must be redoubled to educate people on . . . the fact that degradation of ecosystem services . . . is the main environmental problem, and that reckless expansion of the human enterprise is its main cause.

(Paul and Anne Ehrlich)

The above quote subtly summarizes the focus and concerns of this essay. For some time now, individuals from H. G. Wells to Paul Kennedy have voiced similar warnings regarding the need to "re-educate" humankind in the face of both contemporary and future social and environmental dilemmas. The ecological crisis that has caused many of these concerns continues, with the snows of Mount Kilimanjaro slated to disappear within a few years and glaciers receding at record rates around the world. The United

States, which has barely 5 percent of the world's population, continues to consume, annually, 25 percent of the earth's finite energy resources and adds a similar percentage of anthropogenic carbon dioxide to the atmosphere through its daily consumption and production cycles. At the dawn of the twenty-first century, there is an evident need for all peoples in both developed and developing worlds to better understand the delicate balance that exists between humanity and habitat. To achieve this better understanding and to stimulate action, education in all its forms and on all levels is imperative. For many, the preferred form is education for sustainability. The historical and contemporary perspectives of this concept, along with its continued evolution, are the topics of this theme of EOLSS on-line.

An obvious issue related to "education for sustainability" is its contentious nature. As a concept, there is dispute over its content, process, and practicality among individuals, nations, and assorted international agencies. Scientific knowledge, however, while replete with uncertainties, agrees that anthropogenic forces are influencing earth's life support systems. This recognition has led to the appearance of multilevel, interdisciplinary educational programs focused on the environment, development, and sustainable futures. In terms of global and regional differences, several developed countries, like Australia, Canada, Germany, Great Britain, and the Scandinavian nations appear more advanced in their thinking and educational responses to questions about the environment and humanity's impact on it. Their idealistic educational aims are to create citizens who will contribute to a sustainable future in which humanity and other living species, both fauna and flora, will be able to live within the regenerative capacities of the earth. They appear to accept the growing sentiment of concern among natural and social scientists that humans are stretching the "carrying capacity" of the earth with excessive use and demands on earth's life support systems, including its hydrological, atmospheric, and terrestrial systems. On the other hand, skeptics continue to insist that the resilience of the earth, in its capacity to support the needs and wants of humanity, has yet to be severely challenged, and many continue to believe, despite "sound science," that the earth has sufficient natural resources to continue the current consumption and production cycles of the developed world. Faith also abounds that human ingenuity and technology will solve the most pressing environmental problems resulting from human depletion and pollution of the earth and its natural resources. This debate will be returned to throughout this article.

A closer examination of the concept "education for sustainability" in terms of its parts reveals definitional debates and disputes. "Education" as a concept in all its forms—formal, informal, and non-formal—is open to cultural interpretation. What is education? What should it be? Many say the purpose of education is individualistic: to allow individual humans to grow and develop, to increase and perfect the capacity and potential of mind, body, emotion, and spirit. Others prefer an education that socializes individuals into their proper and correct cultural niches in any given society. Knowledge, values, beliefs, ethics, skills, and dispositions all figure into the debate over the proper interpretation of education. These debates continue in the popular media. They draw attention to the importance of education in the shaping and defining of humanity.

Even the word "for" in the concept "education for sustainability" is contentious in nature. Some believe that to educate someone "for" something in particular eliminates

options and choice, and smacks of indoctrination and specific ideological ends. This may be true under certain circumstances and will be returned to later in this Theme. But by far the most controversial part of this concept is the word "sustainability," a word that implies so much for the present and the future. Above all, it implies an enduring, long-term continuation of the existence of *Homo sapiens* in life on earth. It implies radical understandings and changes related to ecological, social and economic thinking. This thinking envisions a more balanced relationship between humanity and the world, in which humanity lives within the regenerative life support systems of the earth. It envisions a world of social justice, equity, and ecological balance. Just how this is to be achieved is the ultimate challenge of those who espouse this vision. A world so divided between have and have not, so dependent on growth and natural resource exploitation for general welfare, is not easily changed. "Sustainable development" is offered as a method to achieve the vision of sustainability. The kind of development needed, however, to sustain the long-term existence of *Homo sapiens* on earth, requires a zero-growth, steady-state, redistributive approach to development. Such an approach is little understood, let alone favored by the power structures supporting the status quo. The ultimate challenge for those advocating "education for sustainability" is to help these power structures embrace a new sustainable vision that will allow for the sustainable perpetuation of life as we know it on earth.

In the examination of "education for sustainability," the challenge to raise awareness and understanding will first be explored. The environmental crisis has been labeled the fundamental issue of the twenty-first century as earth's life support systems continue to be severely strained by the needs and wants of one species, *Homo sapiens*. Alarms about water, air, and soil, their contamination and loss, abound in the literature and daily news. Such alarm calls for sound scientific knowledge and higher levels of consciousness related to the environment and ecology, in short, a new form of thinking. However, the next section of the article indicates that resistance and obstacles to such new forms of thinking are evident in society and schools. Most students continue to be educated for a world of material progress and growth, in which individual initiative is the key to consumptive and productive success. Formal education in so much of the world reinforces values of the Industrial Revolution that are at odds with the vision of sustainability referred to above. Such values, which include individualism, growth as progress, change, anthropocentrism, and materialism, to name just a few, have undermined the self-reliant and mutually-supportive characteristics of previous ages. Growth of GNP and GDP continue to be considered vital to social progress, despite growing levels of natural resource depletion, pollution, and the persistence of poverty. The values that are taught both explicitly and implicitly in so many classrooms continue to reinforce a "culture of denial" or a modern culture that does not see that its own consumption and production patterns are the root cause of the current environmental crisis. What is needed is a new way of thinking, a paradigm shift if you will, that helps people realize that the current system is "unsustainable." The fourth section of this article deals with this paradigm shift: the support, encouragement, and advancement of "education for sustainability." The evolution of this paradigm shift, from environmental education to education for sustainability, has been steady in the latter half of the twentieth century. International organizations and conventions have engaged in a top-down process of defining and refining. Governments, NGOs, and grass roots organizations have participated in this process from local, regional, and international

perspectives. Debates persist, but conclusions regarding ecological sustainability, linked with social justice and economic equity, are taking shape. The following or fifth section of this article indicates that an evolving cultural consensus has resulted in the appearance of teaching and learning programs for sustainability on every level of formal, informal, and non-formal education. Several of these programs will be examined in greater detail in the individual article and topic contributions in this theme in EOLSS on-line.

2. The Ecological Imperative

We have not inherited the earth from our ancestors; we are borrowing it from our children.

(David Brower)

Is life as we know it under threat of extinction or radical change in the coming years? Data concerning a so-called "Sixth Extinction" cycle facing the earth has been accumulating over the past several decades, provoking concern and alarm in biological circles. Such a Sixth Extinction, in which multiple numbers of fauna and flora are disappearing, threatens the very bio-diversity on which life and its evolution depend, and is considered one of the most critical environmental challenges both now and in the future. This concern about life and its continuation is a new and unique level of thinking in humanity's existence. The realization that is fast becoming reality, as temperatures rise, human populations increase, and tropical forests and vital habitats disappear, is that the needs and wants of humanity are putting inordinate pressures on the earth's life support systems. No geographic area or region appears to be immune. From the Antarctic to the remotest Himalayan valley, the earth is a natural resource for the expanding consumption and production of humanity. Less than ten years ago, in connection with the proceedings of the Earth Summit, a very sober warning entitled "World Scientists Warning to Humanity" (1992) was issued through the Union of Concerned Scientists to world leaders and to humanity by several hundred of the world's most renowned and influential scientists. In very challenging rhetoric, they warned:

The environment is suffering critical stress. . . . Our massive tampering with the world's independent web of life—coupled with the environmental damage which is inflicted by deforestation, species loss, and climate change—could trigger widespread adverse effects, including unpredictable collapses of critical biological systems whose interactions and dynamics we only imperfectly understand. Uncertainty over the extent of these effects cannot excuse complacency or delay in facing the threats.

The uncertainty and unpredictability explicit in this warning are particularly disturbing when put into context. So many of the environmental problems currently faced by humanity were unanticipated, and resulted from both a lack of knowledge and an unwillingness to apply the precautionary principle in the development and application of technology. So many current environmental issues, including global warming and climate change, the ozone barrier, and acid rain, to name just a few, were of little concern thirty years ago on the first Earth Day. What lies ahead as a consequence of continued population growth, affluence, and technological advance, can only be surmised. Whatever may be, the time seems right for a change of attitude and thinking

in relation to the finite capabilities of the earth to support life. The Union of Concerned Scientists' 1992 warning continues:

A great change in the stewardship of the Earth and the life on it is required, if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated. . . . Acting on this recognition is not altruism, but enlightened self-interest. Whether industrialized or not, we all have one lifeboat. No nation can escape injury when global biological systems are damaged. No nations can escape from conflicts over increasingly scarce resources. In addition, environment and economic instabilities will cause mass migrations with incalculable consequences for developed and underdeveloped nations alike.

A new ethic is required—a new responsibility for caring for ourselves and for the Earth. We must recognize the Earth's limited capacity to provide for us. . . . We must no longer allow it to be ravaged. This ethic must motivate a great movement, convincing reluctant leaders and reluctant governments and reluctant peoples themselves to effect the needed changes.

Concern about the future is both implicit and explicit in this statement. There is debate, however, in terms of just what response is appropriate. Awareness and recognition of the situation are essential first steps. However, even here there is some hesitancy and confusion, as demonstrated in the publication and acclaim of such books as Bjorn Lomborg's *The Skeptical Environmentalist* (2001). The evidence is clear that nearly 3 billion people on earth are living an excluded, impoverished existence on less than US$3 a day. For the first time the World Wide Fund for Nature (WWF) and other environmental groups utilized ecological footprint calculations in their *Living Planet Report 2000* (2000) and concluded that the average North American needs five times as much land area to maintain consumption and waste absorption patterns as the average Asian, African, and Latin American. Such distortions do seem to demand a new ecological ethic to achieve a more just world. Such an ethic is being built around the vision of sustainability. For example, growing numbers of higher educational institutions are beginning to recognize their ecological and environmental roles. The Talloires Declaration, which has been signed by over 250 universities worldwide, makes "sustainability" a university goal. Subsequent changes in the content and process of higher education, however, have been slower. Most universities and schools in the modern context continue to favor a mind-set based on growth and development, consumption and production in a finite world. Such a mind-set does not bode well for the future according to the 1993 *Agenda 21* of the Earth Summit. The *Agenda 21* conclusion is clear:

The growth of world population and production combined with unsustainable consumption patterns places increasingly severe stress on the "life supporting" capacities of our planet. These interactive processes affect the use of land, water, air, energy, and other resources.

It bears repeating that substantial information and experience point to a need for a rethinking of the human condition on earth. In this regard, UNESCO's "Declaration on Science and the Use of Scientific Knowledge" of the 1999 World Conference in

Budapest on Science for the Twenty-first Century: A New Commitment, boldly underlines the pressing need for substantive knowledge from the natural and social sciences to assure that the root causes and implications of world poverty, injustice, and conflict are challenged and eradicated. Such scientific knowledge, coming from all cultures, from both public and private sectors, from universities, R&D institutions, and industry, is essential in the achievement of universal human well-being and vital in the development of less polluting, more efficient, and more environmentally friendly approaches to progress. Since 1999, science continues to indicate and inform us that the "carrying capacity" of the planet is being pressured by increasing human demand. The recent warning of the UN Intergovernmental Panel on Climate Change indicates that global warming over the next century will go far beyond what was originally thought, increasing from 2.7 to 10.4 °F. *The Living Planet Report 2000* of the WWF and other environmental groups referred to above conclude that if all of humanity consumed natural resources and emitted carbon dioxide at the same rate as the average citizen of the world's rich countries, atleast two other Earths would be needed for energy production and waste absorption. A new mind-set is definitely needed, and education for sustainability must play a significant role in its development and accessibility.

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Biographical Sketches

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