

ESSENTIAL EARTH LEARNING CONCEPTS FOR TEACHERS AND STUDENTS

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Summary

This chapter provides 10 essential concepts that may assist in dispelling the ultimate myth: that human are somehow separate from nature. The presentation of these concepts is designed to elicit in the reader a state of mindfulness or a heightened awareness that can be practiced regularly and can inform daily actions and lead to a more sustainable world.

The human story, the story of life on Earth and within the known Universe, is still being written. This story, which began about 13.7 billion years, forms an unbroken chain of events that gives humans and the rest of the living beings on this planet an extraordinarily long and rich shared history; one with many periods of drastic change, feedback, adaptation, and creativity. All Life, as it is known, is the result of this ongoing “learning” process.

Although this work is aimed at teachers and students, it is vital to recognize that we all are learners, even Earth (hence the title); and, that this learning process might very well lead to a next step in humanity’s evolution – an evolving global consciousness that all life - both human and other-than-human - past, present, and future, is interconnected.

It is not enough to teach a man a specialty. Through it he may become a kind of useful machine but not a harmoniously developed personality. It is essential that the student acquire an understanding of and a lively feeling for values.

--- Einstein

1. Introduction

If a fundamental change does not occur, future human generations will inherit an Earth with a diminished capacity to support life. Such an opening statement is a reasonable conclusion based on the present lack of concern about “sustainability,” and is a logical result of a “business as usual” attitude that perpetuates social and educational values which encourage hyper-consumption. The problem and contradiction in this scenario are obvious to those who question the West’s uninhibited linear notion of social and economic progress and understand the finite limits of Earth. Modern education, however, continues to perpetuate this concept of linear progress. The growing presence of environmental education has been a good first step to arouse awareness about the protections necessary to ensure the long-term existence of Earth’s life support systems. However, environmental education courses are often marginalized by discipline and ideology in today’s world, and many students never come in contact with the ideas in these courses. In order to achieve sustainability, ecological concern must become all-pervasive in the education of current and future generations. They must learn how to prosper and thrive along *with* Earth, not *in spite of* her.

The challenge is to achieve and create an educational process that will enable current and future generations to reinvent their future, achieve true ecological sustainability, and thrive in the face of seemingly insurmountable challenges that they will surely confront. It is unfortunate that in the current period of specialization, students and people in general learn more about less (i.e. specialization that leads to reductionism). There is a need for a more broadly spread awareness (learning less about more!) in order to make sense of the whole world and to assure that sound, collective decisions that face humanity will be made in a sustainable manner.

Earth Learning implies that, in a very real sense, Earth itself is engaged in a learning (read adaptive) process, evolving and changing for over 4.5 billion years; *a continual albeit slow teasing out of what does and does not work.* It is trial, error and learning on a grand scale. This moment in time is challenging humans to be mindfully present in this Earth/Life process. Therefore, Earth Learning also means that humanity must re-engage in a co-evolutionary relationship with Earth in order to discover *how* to live on this planet (and within our local ecosystems) in harmony with each other and with the rest of the biosphere. To achieve this reconsideration of the human relationship with Earth and her community of Life (the subject of this chapter) it is necessary for people to begin to access the greater understanding accumulated from this continual and emerging learning process.

2. Essential Concepts

Below, the most important and vital concepts for Earth learning are considered. These concepts are derived from the author’s experiences and from the various sources referenced in this chapter that collectively support an emerging movement of social re-

education to achieve present and future ecological sustainability. It is sincerely hoped that these concepts find their way into every possible classroom, religious school, scouting group, environmental center, museum program, appropriate workshop and conference. Such an educational effort that results in an awareness and formation of a benign global Earth ethic may very well be the most important step in human evolution.

2.1 There Is No Environment

To most people the word “environment” implies some object somewhere else. Yet, there is no environment separate from humanity. What is done to Earth is done to fellow humans and to the community of life that is Earth. For example, take molecules of air. Not only do humans share them with most other life forms on this planet, but they have shared them with many of the life forms in the past, including such figures as Jesus, Mohammed and Buddha. More importantly, they will share them with all those in the future. Indeed, respiration is impossible for humanity without the collaboration of a host of microbes within the body that work in partnership to transform air and food into the energy that sustains life.

The interconnectedness and interdependence of Earth’s life web, a concept most eloquently explained by so many past and contemporary thinkers, depends on a complex diversity of species to function as a healthy community. As indicated above, the human body itself is a complex ecosystem. Many of its functions, such as breathing and digesting, are assisted and performed by organisms that humans simply could not live without. Human outer skin often acts less like a barrier and more like a sponge. Many historical and contemporary scientific studies demonstrate that the mind reaches far outside the brain; simple scientific experiments (i.e. dogs who know human companions are coming, while they are still many miles apart or people who receive phone calls from a loved one and sense who it is even before they answer) have been performed to demonstrate this. In a similar way, a tree is not separate from the soil that feeds its roots, the water that flows everywhere inside and out, and the air it breathes. In living systems boundaries exist for purposes of identity, not separation. As John Dewey so succinctly pointed out so many years ago, a living organism does not live in an environment, but by means of and as Fritjof Capra might add, in connection and harmony with that environment. Such thoughts are currently echoed in the literature dealing with holistic and ecological interpretations of the world and education. (See Topic section 6.61.4 in this Theme) Are the sun and light two separate entities, or are they one? The same question can be raised about mind and body. They are certainly not the same, but are they separate entities or are they one? Reductionist science and Western ways of thinking fail to clarify. Modern scientists classify and categorize, dissect and analyze, and produce more and more information. But more information (a product) can also serve to flood and dilute the understanding of the whole. Fortunately, hermeneutics and systems thinking (both processes) counter these limitations in the achievement of greater understanding.

2.2 Earth Is Alive

For centuries humans have believed that Earth was an object, a rock floating in space, with living beings on its surface. Now, many believe that Earth is a living, breathing,

self-sustaining and self-educating organism. James Lovelock's Gaia theory suggests that all of the cumulative activity in Earth's biosphere - every cycle (water, rock, carbon, etc.) and life process sustain the planet's atmosphere and regulate its temperatures to keep it just right for life to continue much as the human body does. This appears certain because although the sun has gotten progressively hotter over time, the Earth has maintained a fairly even range of temperatures. It has been discovered that Earth's microbes and indeed all the rest of the solar powered organisms that breathe and photosynthesize, live and die to keep the atmosphere (Earth's thermostat) regulated within a given range.

According to current science, Earth is 4.5 billion years old. It is still changing and evolving with greater complexity and diversity in its life forms. It takes a diverse ecosystem to be resilient enough to withstand natural disturbances, much the same way it takes a strong immune system to protect humans from disease. Complexity and diversity mean that Earth is not putting all its eggs in one basket. However, many assert that human impact on the natural world and the resulting loss of biological diversity are drastically diminishing Earth's capacity to sustain life. The global extinctions Earth currently faces, the main causes of which are anthropogenic (global habitat destruction, global toxic contamination, and global warming), means that unique life forms are being permanently lost at higher rates than during any of the previous five mass extinctions that have occurred on this planet. This sixth extinction, which would be reduced and eliminated in the sustainable future envisioned in this and other chapters in this EOLSS Theme, threatens the life-sustaining capacity of Earth.

2.3 Evolution Is Not A Theory.

The Universe began at a given point some 13.7 billion years ago or so. How it began is unknown. However, it is known that the Universe has been expanding and increasing in complexity ever since. Earth continues to evolve within the context of this expanding Universe. Life has evolved here as an integral part of the planet. It has created itself from itself; beginning with simple, single-celled organisms and maturing into an evolutionary explosion of beautifully complex and diverse multi-cellular creatures. Humanity shares an inherent and inherited genetic memory, passed down from these first life forms; humans share 99% of their DNA with other primates. The elements -- hydrogen, helium, oxygen, carbon—a one time creation of the Universe, are the living materials on which all life is based. Yet, some humans feel threatened by this concept of evolution, and they fear the spreading of its acceptance for various reasons. They fail to notice two crucial things. The first is that the evolution of life is quite the miracle, with any one of a billion things that could have gone wrong along the way.

Every great extinction phase over the last 4.5 billion years of Earth history has been a portal where only a reduced percentage of the species then in existence passed through. And yet in the present there is a plethora of magnificent creatures on the Earth. The second crucial issue is that evolution presents a far more powerful, deliberate, and awe-inspiring set of events than any one-time, instant creation. In deed, the process of the Universe's unfolding over 13.7 billion years, as seen from the current viewpoint, provides humanity (and the entire life community!) with a fascinating shared history.

Teaching evolution as an integral part of Earth Literacy (See Chapter Earth Ethics, Earth Literacy, And The Community College in this Theme) is a vital way of communicating that humanity is inextricably connected to Earth. Early humans lived by this knowledge. In a sense, they were enchanted by Earth and lived as an integral part of it. The recent, current norm of living, at least from the Westernized/industrial perspective, traditionally treats Earth as an infinite resource for the sole benefit of humanity and considers humans separate from nature. This development has allowed humanity to step outside of local ecosystems to affect the planet globally as one super organism, a geophysical force. Many chapters in this Theme elaborate on this force in relation to humanity's growing ecological footprint on Earth. (See for example, Chapters Knowledge Of The Future And The Role Of Institutions In Creating Ecological Sustainability and Indigenous And Neotraditional Knowledge Systems And Their Role In Creating And Maintaining Ecological Sustainability in this Theme) It is time to re-inhabit (re-conceptualize our relationship to) local ecosystems. By ignoring or rejecting evolution, many humans are basically saying that they do not belong on Earth. They, in effect, have rejected their rich and vibrant inheritance and their rightful place in the community of life.

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Bibliography

The New Story

Swimme, Brian and Thomas Berry (1994). *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era-A Celebration of the Unfolding of the Cosmos*. San Francisco: Harper. [The original and most complete telling of the New Story from a spiritual and scientific perspective that assigns a new reality to humans with respect to their relationship with Earth; to the end of the present Cenozoic Era, 65 million years of extraordinarily creative evolutionary process; and to the Earth as a one-time endowment that as such is subject to irreversible damage to her life support systems.]

Gaia: The Living, Interconnected Earth

Capra, Fritjof (1996). *The Web of Life*. New York: Anchor Books. [A well developed, scientifically-based claim arguing for the interdependence of life on Earth and for the interconnectedness and interdependence of Earth's life web of which humans are just a strand. According to the author, living systems boundaries exist for purposes of identity, not separation and nature should be used as a model for sustainability and/or sustainable communities.]

Sussman, Art (2000). *Dr. Art's Guide to Planet Earth: for earthlings ages 12 to 120*. White River Junction VT: Chelsea Green Publishing Company. [An extremely accessible and brilliantly-illustrated explanation of how our planet works and what happens when its balance is disturbed. All of the cumulative activity in Earth's biosphere - every cycle (water, rock, carbon, etc.) and life process sustain the atmosphere and regulate temperatures on this planet to keep it just right for life. The author clearly points out that the Earth is a recycling planet, powered by the energy of the sun that supports a complex and interconnected life web.]

Lovelock, James E. (2000). *Gaia: A new Look at Life on Earth*. Oxford: Oxford University Press. [This book presents ecological evidence that considers the Earth an organism with the ability to regulate its own functions and processes in a self-adaptive manner. For the author, Earth is a living, breathing, self-sustaining organism.]

Perspectives on Evolution and the Human Condition

Eldredge, Niles (1995). *Dominion*. New York: H. Holt & Co. [This book presents a lucid explanation of the early period of humanity that recreates the transition to a human species that transcends its local ecosystem by changing it rather than adapting to it. Humanity has been able to step outside of local ecosystems to affect the planet globally as one super organism, a geophysical force.]

Margulis, Lynn. (1986). *Microcosmos: Four billion years of evolution from our microbial ancestors*. New York: Summit Books. [This study traces human interdependence with the biosphere, giving readers a new perception of Life's evolutionary process and a glimpse at the possibilities for life still ahead.]

The Case for Sustainability

Rees, William E., Mathis Wackernagel, and Phil Testemale. (1995). *Our Ecological Footprint: reducing human impact on the earth*. Gabriola Island, B.C.: New Society Publishers. [This book creates a new model for measuring human impact on Earth with its finite living resources by combining consumption and population tied to available land and sea area.]

Suzuki, David T. (1998). *The Sacred Balance: rediscovering our place in nature*. Amherst, N.Y.: Prometheus Books. [This book is an eloquent illustration of the concept that there is no environment separate from the human form. It is a spiritual call to ecological sustainability from a renowned scientist.]

Evolving Consciousness and the Emerging Worldview

Berry, Thomas (1990). *The Dream of the Earth*. San Francisco: Sierra Club Books.

Berry, Thomas (1999) *The Great Work: Our Way Into The Future*. New York: Bell Tower. [Berry is considered one of the fore-most thinkers of our time. These two works outline an immense yet precise vision of the task ahead for humanity, if we are to create an ecologically-sustainable future.]

Compassion, Truth, Non-violence, and Personal Responsibility

Einstein, Albert. (1994). *Ideas & Opinions*. New York: Modern Library.

Einstein, Albert. (1993). *The World as I See It*. New York: Citadel Press. [A great scientist, thinker, philosopher, and humanitarian expresses his thoughts on a full range of topics that are still critically salient to humanity's predicaments today.]

Gandhi, Mahatma K. (1983). *Autobiography: The Story of My Experiments with Truth*. Mineola, N.Y.: Dover Publications [The life of Gandhi depicted herein serves to teach the applications compassion, nonviolence, and truth-seeking through example.]

Transforming Education

Orr, David (1994). *Earth in Mind: on earth, environment and the human prospect*. Washington, D.C.: Island Press.

Orr, David (1992). *Ecological Literacy: education and the transition to a postmodern world*. State University Press of New York. [Orr exposes an educational system subservient to a dominant economic system and outlines a credible educational model for long-term, ecological sustainability.]

Sterling, Stephen (2001). *Sustainable Education: re-visioning learning and change*. Totnes: Green Books for the Schumacher Society. [This author argues that an ecological, sustainable education must catalyze a shift toward a culture that both realizes human potential and can ultimately transform the learning experience. He asserts that a system (or society) that undermines its own subsystems or the larger system, of which it is a part, is unsustainable.]

Bioregions / Living in Place

Jackson, Wes (1996). *Becoming Native to this Place*. Washington, D.C.: Counterpoint Press. [Explores the concept of sense of place, how it was lost and how humans must regain it to form communities in intimate relationship with the land.]

McGinnis, Michael Vincent. Ed. (1999). *Bioregionalism*. London: Routledge. [Presents a wide range of perspectives on the emerging field of bioregionalism.]

Traina, Frank and S. Dailey-Hill. Eds. (1995). *Perspectives in Bioregional Education*. North American Association of Environmental Education. [This book provides a basic definition of bioregions and of the cultural learning necessary to re-inhabit them in a sustainable manner.]

Earth Learning

Benyus, Janine (1997). *Biomimicry: Innovation Inspired by Nature*. New York: William Morrow. [Gives salient examples of nature's technologies and how humans can mimic these in the design of a more sustainable future.]

Norberg-Hodge, Helena. (1992). *Ancient Futures: Learning from Ladakh*. San Francisco: Sierra Club Books, 1992. [The author gives readers a rare glimpse into one of the few traditional cultures who lived intimately within its limited ecosystem and was, until recently, not affected by modern society. She hopes that humankind can learn from the values and wisdom of this culture.]

Schumaker, E. F. (1989). *Small is Beautiful: Economics as if People Mattered*. New York: Harper Perennial. [Teaches the importance of the maintenance of appropriate scale in human culture, especially as it relates to economic systems.]

Van der Ryn, Simm and Stewart Cowan (1996). *Ecological Design*. Washington, D.C.: Island Press. [Provides realistic examples of how humans can work with nature to achieve sustainability within particular places by learning from and living according to tried and tested natural designs.]

Biographical Sketch

Mario Yanez has an M.A. in Latin American and Caribbean Studies with a concentration in Environmental Studies from Florida International University where his main research was on Cienaga de Zapata, Cuba. He is a Ph.D. candidate in Environmental Anthropology, also at FIU, where he will examine the interaction of human and natural systems in his home bioregion: The Greater Everglades. He is a core member of the Earth Ethics Institute at Miami Dade College.

The author is founder of Earth Learning, a learning community that attracts, inspires, creates, and sustains people, ventures, projects, activities dedicated to Earth Literacy and Bioregional Sustainability (more at www.earth-learning.org). He is a Senior Fellow at the Environmental Leadership Program, a diverse national network of visionary, action-oriented emerging leaders.

He teaches undergraduate ecology & environmental science as well as Earth literacy. He has been an informal science educator since 2002 when he led an after school program for 4th and 5th graders, established a community native plant nursery, as well as ran various environmental education programs for adults. During the year, he leads workshops and field immersions on *Becoming Native to Our Bioregion*. In his teaching, he values combining lively discussion with plenty of hands-on field experiences.

When he is not working, he enjoys making time with his family and friends, organic farming, gardening with native plants, being in Nature, working towards attaining a simple and sustainable lifestyle, and striving to understand what it means become "Human".