



Living Earth Community

Multiple Ways of Being and Knowing

EDITED BY

SAM MICKEY, MARY EVELYN TUCKER, AND JOHN GRIM



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20. Learning to Weave Earth and Cosmos

Mitchell Thomashow

The living Earth community is a beautiful vision of how to live on this magnificent planet, suggesting that we broaden our perspective to include multiple ways of knowing and being. The fine essays in this volume consider the ethical, spiritual, and perceptual challenges of this vision, offering new approaches to planetary citizenship in an evolving cosmos. This is also an educational challenge. Can we overhaul how we think about learning and teaching so that it is derived from our common aspiration — how to live in a flourishing living Earth community? This challenge encompasses two dimensions. The first is to develop the foundations for this approach to learning. The second is to offer curricular suggestions for multiple educational settings.

Throughout my career I've strived to develop educational approaches to enhance environmental awareness. Two earlier works, *Ecological Identity: Becoming a Reflective Environmentalist* (1995) and *Bringing the Biosphere Home: Learning to Perceive Global Environmental Change* (2001), emphasize the necessity of growing a place-based orientation to ecological awareness, while deepening our understanding of biosphere processes. A new work, *To Know the World: Why Environmental Learning Matters* (2020), applies that philosophy to the challenging issues of our times — migration, the Internet, social justice, networks and connectivity, and adaptation. All these books — indeed, my lifework — concern learning to weave identity and the biosphere. The substrate of Earth and Cosmos is always there. In this short essay, I'd like to briefly explore the educational qualities that are the source of these aspirations. I hope they

provide readers with an educational foundation for weaving Earth and Cosmos.

The most crucial element in promoting this deepening awareness is in cultivating the ecological imagination, learning how to expand spatial and temporal scale, perceiving the interpenetration of landscape, biosphere, and cosmos, entering the multiple *Umwelts* of the countless species with whom we share our planetary residency. There are many precedents for this vision. As Andrea Wulf concludes in her magnificent biography of Alexander Von Humboldt ‘we can only truly understand nature by using our imagination’.¹ For Humboldt, ‘the imagination soothed the deep wounds that reason created.’² Humboldt’s active imagination was stimulated by his extraordinary observational powers, his ability to synthesize information, his interpretive originality, his dynamic expressive approaches, and their manifestation as exemplified by both his scientific work and his outspoken critiques of colonialism and slavery. What is the twenty-first century version of this sequence of observation, information, interpretation, expression, and manifestation?

I’d like to propose a sequence of learning pathways, ways of knowing that are specifically organized to expand environmental awareness, and hence weave Earth and Cosmos. I describe these learning pathways as ‘the five qualities’ because they represent distinctive attributes. Each quality entails intrinsic learning processes. All of the qualities and learning processes are simultaneously enfolding and unfolding. They encompass each other while they reveal deepening insights. These qualities are interconnected and mutually reinforcing.

This is not an empirical theory, but rather an informal template, based on four decades of teaching and thinking about environmental learning. I offer this approach in the spirit of educational experimentation and improvisation. There are multiple ways to arrange these qualities. I would like to explain the predispositions that inform my approach.

First, I’m intrigued by the dialectic between perennial and adaptive learning. Perennial learning represents an educational virtue that is consistent across cultural place and time. Environmental insights emerge in similar ways in a variety of cultural settings. Yet, the context of learning

1 Andrea Wulf, *The Invention of Nature: Alexander von Humboldt’s New World* (New York, NY: Alfred A. Knopf, 2015), p. 336.

2 *Ibid.*, p. 84.

is never the same. People, cultures, and organisms respond to changing circumstances. Hence, learning is also adaptive. In the first decades of the twenty-first century, dynamic environmental change and the acceleration of information technologies are the context for adaptive learning.

Second, I don't think educators spend sufficient time considering how people learn, especially in higher education. Most curricular controversies are substantive. However, *how* you learn is as important as *what* you learn. The skills of lifelong learning are typically internalized when you learn how to learn, and these skills receive insufficient reflective attention.

Third, ecological thinking embodies a paradigmatic shift in how we think about learning. That shift transcends interdisciplinarity per se. It assumes innovative approaches to how we engage as learning organisms in complex environments, how we see ourselves in the biosphere, and how we expand our concepts of place and time.

Fourth, I consider organizational schemes as mandala sand paintings. You create a temporary order of symmetry, coherence, pattern, and meaning, and then you let it all dissipate and recreate it as necessary. Learning is a reflective blend of structure and improvisation, pattern and chaos, coherence and dissonance.

Fifth, the best way to think about any organizational scheme is to personalize it, using it as a way to explore how you learn, how you observe the way others learn, and by considering how learning is a reciprocal relationship between the self, culture, and the environment.

I encourage you to experiment with these qualities and rearrange them to suit your own purposes.

And now for the five qualities.

Observation emphasizes a broadened understanding of biosphere patterns, including the ability to design learning activities and research approaches that enhance perception of global environmental change, an understanding of the relationship between local and global, and the ability to move between spatial and temporal scales. Observation entails perception, identification, and pattern recognition. *Perception* is the development of sensory awareness, so as to apprehend movement, metabolism, pace, and behavior. *Identification* allows an individual to enter the lifeworld (umwelt) of other organisms. *Pattern Recognition* is the ability to assimilate perception and identification by using scale

to detect symmetry, cycles, waves, thresholds, interstices, flows, and species interactions.³

Information describes the ability to gather data from a variety of sources, organize that data, assess its relevance and application, and understand how to use it effectively. Information entails sourcing, browsing, and networking. *Sourcing* involves understanding the origins of information, its dissemination, its transformation, and how it is manipulated or translated based on opinion and perspective. *Browsing* involves the survey of information, including scanning (seeing the breadth of the field), scaling (understanding its context), focus (knowing how to look more deeply), and granularity (finding its constituent pieces). *Networking* entails mapping information, tracing its routes and paths, determining its speed of transmission (mobility), and understanding who has access to it. An interesting way to conceive of information, and an approach that is facilitated by computer graphics, is the emerging field of information design and visualization. Information design uses the above concepts and develops visualization processes to enhance our understanding of them.

Interpretation is the challenge of generating meaning from observation and information. This includes constructing narrative, amplifying and articulating personal voice, and developing themes and approaches for communicating complex environmental issues. Interpretation entails synthesis, dissonance, and narrative. *Synthesis* is the ability to find coherent relationships within diverse fields of information while finding the essence of ideas and explanations. *Dissonance* reflects the tensions inherent in synthesis, the recognition of nonlinearity, different perspectives, and contrasting possibilities. *Narrative* is the ability to create arcs of unfolding meaning, embodying both synthesis and dissonance through the use of allegory, metaphor, and story. In the twenty-first century, electronic communications make new forms of narrative available and novel forms of expression possible, including the use of diverse media, and reliance on iconography, design, and virtual/visceral matrices, demanding innovative approaches to interpretation.

3 For a comprehensive discussion of these issues, and for specific examples from the field of ecology, see Rafe Sagarin and Anibal Pauchard, *Observation and Ecology: Broadening the Scope of Science to Understand a Complex World* (Washington, DC: Island Press, 2012), <https://doi.org/10.5822/978-1-61091-230-3>

Expression is the ability to effectively communicate interpretive approaches by cultivating creative possibilities in venues such as storytelling and eloquence, writing and personal reflection, information design and display, artistic mapping, public art, soundscape design, animation and video, music and dance performance, game design, and other forms of iconography and representation. Expression entails imagination, improvisation, and activation. *Imagination* is a unique blend of creativity, visualization, and reflection, allowing the mind to form uninhibited images and possibilities by exploring the unconscious, and melding psyche with the biosphere. *Improvisation* is the ability to spontaneously respond to dynamic changes in the environment by adapting structures of knowledge to new contingencies, or playing with forms and ideas as they emerge. *Activation* is the application of imagination and improvisation through experimentation, innovation, and implementation. Electronic communications enable a spontaneity of response that can have wide (but not necessarily deep) impact in a short period of time. How can expression be simultaneously deep and wide, perennial and adaptive, structured and improvisational, active and reflective?

Manifestation refers to the generosity of interpretation and expression, applying narrative forms to enhance human flourishing in the biosphere. This includes an understanding of social and emotional intelligence, interspecies empathy, the ability to form collaborative connections and challenging learning communities in multiple cultural settings, the ability to engage in creative conflict, and the awareness to improvise in and adapt to diverse learning venues. Manifestation entails generosity, posterity, and flourishing. *Generosity* is the ability to demonstrate kindness, compassion, and respect in service to cultural community and ecosystem integrity. It encourages empathy, dialogue, connectedness, and love. *Posterity* requires awareness of past and future generations, the ability to act with respect for legacy and outcome, and to do so with an expansive time scale. If we combine posterity and empathy, we consider our actions in all of these contexts — intergenerational, multicultural, interspecies, urban/rural, local/global, and cosmopolitan. *Flourishing* is the ultimate goal of environmental learning, to create settings that allow for optimal human thriving in the dynamic biosphere. Flourishing promotes pleasure, virtue, equity, opportunity, collaboration, community, restoration, and reciprocation.

The ‘Five Qualities’ are integrative pathways for a ‘living’ education on a ‘living’ Earth — approaches that enhance wonder, appreciation, gratitude, reciprocity, and service. Reflect again on the meaning of the living Earth community. Humans participate in a complex evolutionary and ecological matrix of species and landscapes. This broad and splendid concept of community demands that we open our minds to the extraordinary circumstances of human awareness in the biosphere, of planetary evolution in the cosmos, of cosmic dimensionality and ethical clarity. Above all, it challenges us to live in a state of wonder and reciprocity, demanding that we live meaningful and purposeful lives. And yet all of this must be made tangible by bringing it home to the places where we live, the habitats that nourish us, our human and more than human neighbors, and how we choose to live complex and fulfilling lives. Now more than ever this is the educational challenge of our times.

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