

## **DEEP SYSTEMS THINKING & THE ECOLOGY OF HUMAN EXPERIENCE**

**Christopher Chase**  
**Seinan Gakuin & Kyushu University, Fukuoka, Japan**  
[c-chase@seinan-gu.ac.jp](mailto:c-chase@seinan-gu.ac.jp)

### **Abstract**

Deep Systems Thinking (DST) is presented here as an interdisciplinary pedagogical framework informed by a unified cosmological perspective that understands human life and experience as embedded within interconnected systems and as expressions of an evolving, meaningful Universe. This paper offers a reflective account of how a systems science curriculum has been developed over several decades of teaching and experimentation in Japan, shaped by ongoing student feedback and participation. The DST model brings together insights from systems science, ecology, cosmology, and contemplative traditions to help learners recognize patterns of interdependence, change, and learning across domains. It is organized around five foundational principles: that systems are universal, joined through flows, dynamic through cycles, experienced through consciousness, and shaped by human learning processes. A key contribution emerging from student experience is the distinction between vicious and virtuous cycles, which provides an accessible way to understand how unwise actions generate problems and instability, while systems thinking and wisdom supports increasing balance and stability. The aim is to share a practical and adaptable integrative framework that may support educators in fostering deeper understanding, collaborative problem-solving and creative systems thinking in an increasingly complex world.

### **Keywords**

Deep Systems Thinking, Systems Education, Vicious and Virtuous Cycles, Ecological Consciousness, Interdisciplinary Curriculum

*“Every particular in nature, a leaf, a drop, a crystal, a moment of time is related to the whole, and partakes of the perfection of the whole. Each particle is a microcosm, and faithfully renders the likeness of the world.” ~Ralph Waldo Emerson, Nature (1836, p.54-55)*

### **Introduction**

In this paper, I will share the key concepts and ideas of *Deep Systems Thinking (DST)*, a way of viewing life ecologically and holistically that is central to an interdisciplinary Systems Science curriculum that I have been teaching and developing in Japan, since the 1990s. I believe that a pedagogical framework like DST could help to unify current silos of knowledge in education and science, shifting how young people see and experience the world, providing them with meaningful insights and conceptual tools that can help them to live successfully and wisely. Most importantly, what I’ve observed is that a *unified systems worldview* can assist young people

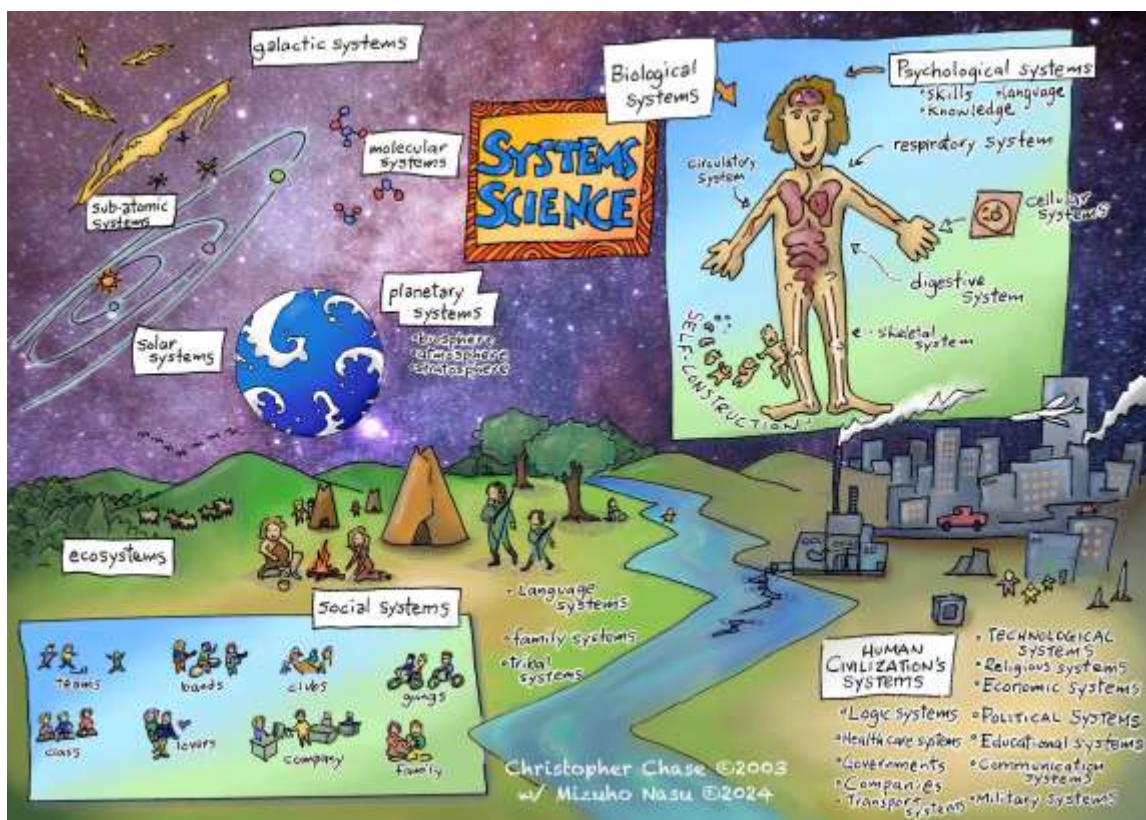
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with creative problem solving and critical thinking—something urgently needed in order to grapple with the significant challenges they will face in the 21st century. As Albert Einstein and other scientists (Russell & Einstein, 1955) warned after WW2, to solve the difficult problems facing our species, a new way of thinking is required.

Deep Systems Thinking (DST) is a term I have been using for a way of understanding human life as governed by natural laws, viewing ourselves as ecologically embedded in nature's systems and the creative self-organizing processes of the Universe. The curriculum that I've been teaching (Chase, 2021) is aligned with insights from Taoism and Buddhism (Herrigel, 1953; Watts, 1961; Watts & Huang, 1975), social and developmental psychology (Bandura, 1986; Ford & Lerner, 1992); deep ecology (Naess, 1973; Meeker-Lowry, 1988; Seed, 1988), deep-time cosmology (Swimme & Berry, 1992), indigenous spirituality, and systems science (Jantsch, 1980; Capra, 1982; Laszlo, 1983; Sahtouris & Lovelock, 1996), while also resonating with perspectives found in quantum physics (Bohm, 1980), science fiction (Heinlein, 1961; Herbert, 1965), creation spirituality (Fox, 1991), cosmogenesis (Swimme, 2022), and spiritual ecology (Vaughan-Lee, 2013).

DST seeks to transcend and connect many diverse fields of human knowledge and experience. To help young people understand how systems science presents each of us as part of the Universe, I drew the following illustration in 2003. It's the first image that I share when introducing these ideas. Most of my Japanese students have never thought about how everything in the Universe is a system, or how all the knowledge they have learned in different science classes can be unified as a cohesive and meaningful whole.

**Exhibit 1.** Systems Science Illustration by Christopher Chase and Mizuho Nasu Chase



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Central to the DST curriculum is that young people are encouraged to use their imaginations to visualize how everything in the cosmos is connected and organized *ecologically*, assisting them with the construction of *mental models*, visual cognitive representations that help them understand what is going on in human society, in their bodies, atoms and cells, in family systems, solar systems, forests, oceans and even within their own minds (Chase, 2021). What has been fascinating for many students is discovering how they are unique expressions of creative cycles and regenerative principles that are present everywhere in nature and the universe. As one student put it (Chase, 2020), “For the first time, I felt I belonged to something bigger than myself. Understanding my role in the family, community, and cosmos awakened compassion I didn’t know I had.”

In Western cultures, a *deep and unified cosmology* similar to the model presented here has arisen repeatedly, as seen in the philosophy of Spinoza (1677), the poetry of William Blake, Transcendentalism (Emerson, 1836; Whitman, 1855), and William James’ explorations of human experience (1902, 1909), as well as in the paintings of Van Gogh. For 17th-century scientists such as Isaac Newton, the Universe was a unified mechanism—a giant clock guided by underlying laws. Inspired by the philosophy of Hermes (Dobbs, 1975), Newton viewed the endless changes and transformations of chemistry as a kind of cosmic alchemy. A similar perspective arose in the work of Dutch philosopher Baruch Spinoza (1677). For Spinoza, God was not separate from the world but the living intelligence of Nature itself—a view that strongly influenced Albert Einstein’s understanding of humanity as part of a unified cosmic whole (Hermanns & Einstein, 1983).

While mainstream science education tends to avoid discussion of religious cosmologies, Einstein credited Immanuel Kant and Spinoza as key influences on his view that spirituality can be unified with science if religious dogma and literal interpretations of religious texts are set aside and one focuses on cosmic processes, natural laws, and the unity of all things (Hermanns & Einstein, 1983). Einstein’s insight that humans exist as part of the Universe as a whole—and that matter is composed of energy—emerges from this perspective.

Fundamental to the DST perspective that I share in my classes is the understanding that everyone and everything in the Universe is a self-organizing system, connected to other systems and made up of systems (Jantsch, 1980; Capra, 1982; Ford & Ford, 1987; Ford & Lerner, 1992; Chase, 1996b; Swimme, 2022). Moreover, most of these systems are highly creative and participate in evolutionary, cosmological processes. This is as true of ecosystems, galaxies, atoms, and cultural communities as it is of individual human beings and the inner landscapes of our consciousness. Many young people are surprised to hear this—to learn that they are as much a part of nature and the Universe as trees, stars, mountains, clouds, rivers, molecules, and butterflies.

Our modern social institutions usually identify us by our differences, emphasizing characteristics such as name, age, gender, nationality, educational level, economic status, job, physical appearance or politics. But beneath these social personas lie deeper layers of relatedness and shared identity. This understanding aligns with Martin Buber’s distinction between *I–Thou* and *I–It* ways of relating to life (Buber, 1958). *I–It* thinking objectifies both nature and people, giving rise to dehumanization, labeling, stereotyping and othering, whereas the *I–Thou* perspective fosters deep respect, presence, and connection.

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Related observations have risen into modern human awareness before. Aldous Huxley (1945) shared glimpses of a nondual systems worldview, as did Buckminster Fuller (1981), Joanna Macy (1991a, 1991b), and many others. Similar insights burst into the consciousness and culture of an entire generation during the 1960s, when millions of young people around the world experimented with psychedelics and experienced themselves as children of nature and the cosmos (Watts, 1962), realizing as Joni Mitchell (1970) put it, that “we are stardust, we are golden, we are billion-year-old carbon.”

More recently, Uri Bronfenbrenner (1993), David Suzuki (2006), Robin Wall Kimmerer (2013), Jane Goodall (2013), Daniel Christian Wahl (2016), Satish Kumar (2017), Jeremy Lent (2021) and many others have shared deep ecological systems perspectives, presenting their visions of humanity, the cosmos and nature as one planetary community. Yet, in contrast to these perspectives, my experience as an educator has been that formal curriculum in schools around the world *rarely* present life, science, art, history, current events, economics, ecology and spirituality in this *unified* way (Chase, 2021).

As ecological consciousness and scientific knowledge matured in the last century, so has an appreciation of life’s profound beauty, mystery and sacredness. Most importantly, dualistic views of humans as separate from and superior to nature have been challenged. Since the 1960s, a new blend of science, the arts, and mysticism has emerged across many fields, communicating a more integrated and relational understanding of life and the Universe. As Emerson (1836) and William James (1902) described, when people grasp the underlying interdependence of everything, they often experience a profound sense of cosmic belonging. Feedback from my students in Japan indicates that integrating powerful feelings of spiritual connection with the deep insights of ecology and systems science, can make such experiences more accessible and less rare.

Chief Luther Standing Bear expressed the value of such a unifying worldview clearly: “This concept of life and its relations was humanizing, and gave to the Lakota an abiding love. It filled his being with the joy and mystery of living; it gave him reverence for all life; it made a place for all things in the scheme of existence with equal importance for all” (as cited in Nerburn, 1999, p. 37).

Building on these insights, vital to the DST curriculum presented here are *rich* and *realistic* models of cycles, processes and relationships in the world, rooted in visually meaningful examples of how systems in nature, human society and the Universe are connected and how they change. I’m in agreement with thinkers such as Watts (1961), Bateson (1979), Bohm (1980), Capra (1982), Macy (1991b), Meeker-Lowry (1988) and Swimme (2022) that fragmented ways of thinking in modern cultures are a root cause of many global problems and a key reason humans struggle to solve them. At a conference on the *Arts, Science and Spirituality*, David Bohm (1990) observed that, “the difficulty is this fragmentation. All thought is broken up into bits. And they can’t meet. Wholeness is a kind of attitude or approach to the whole of life. If we can have a coherent approach to reality then reality will respond coherently to us.”

The way I have been teaching systems thinking in Japan is not the only way to present it. Few of the concepts described here are new; rather, this paper presents a reflective account of how an interdisciplinary systems thinking curriculum has been developed through long-term teaching and experimentation. The challenge has been finding ways to make this deeper way of thinking and experiencing life accessible and meaningful for students. Montessori educators have taken a similar approach, which they call *Cosmic Education* (Duffy & Duffy, 2002), and there are likely many others around the world working in related ways. I do not claim that the DST

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model is better, only that students increasingly report that learning about systems thinking in this way is fascinating and inspiring. Prior to COVID, such responses were rare; now they are more common, based on the feedback I have received.

What is distinctive in the pedagogical approach presented here is how students explore the connections between their own lives and countless systems in the Universe—from music, films, family relationships, and technology to the flow of human history and the formation of atoms, stars, and galaxies. We also examine complex global challenges such as war, addiction, inequality, educational failure, poverty, and ecological destruction, asking why these problems persist and how they might be understood and addressed through human collaboration and creative systems thinking.

A significant contribution to this curriculum has come from students themselves. One important insight that emerged from their feedback is that the distinction between vicious and virtuous cycles provides a simple but powerful way to organize observations—helping them recognize how system instability generates problems, while increasing balance and stability reduces them. My Japanese students also identified examples of systems thinking within Shinto and Buddhist traditions, leading to the realization that systems thinking is not new, but has deep cultural roots and has been practiced in different forms across cultures and throughout history. By presenting this co-developed curriculum, supported by student insights and examples, the aim is not to offer a definitive model, but to share a pedagogical framework that may be useful or adaptable for other educators.

I believe that interdisciplinary systems science curriculums like this are especially needed at this time. DST's emphasis on history, cosmology, imagination, problem-solving, and storytelling echoes the work of Brian Swimme and Thomas Berry, who, in *The Universe Story* (1992), called for new “cosmic storytellers” to help articulate the emerging cosmology of modern science and a deeper sense of human identity. As Berry (cited in Swimme, 2022) expressed it, “We are Earth. We are a living sentient planet. We are carrying further the creativity that brought forth the stars and galaxies. Whether we are fully conscious of this or not, it is happening” (p. 277).

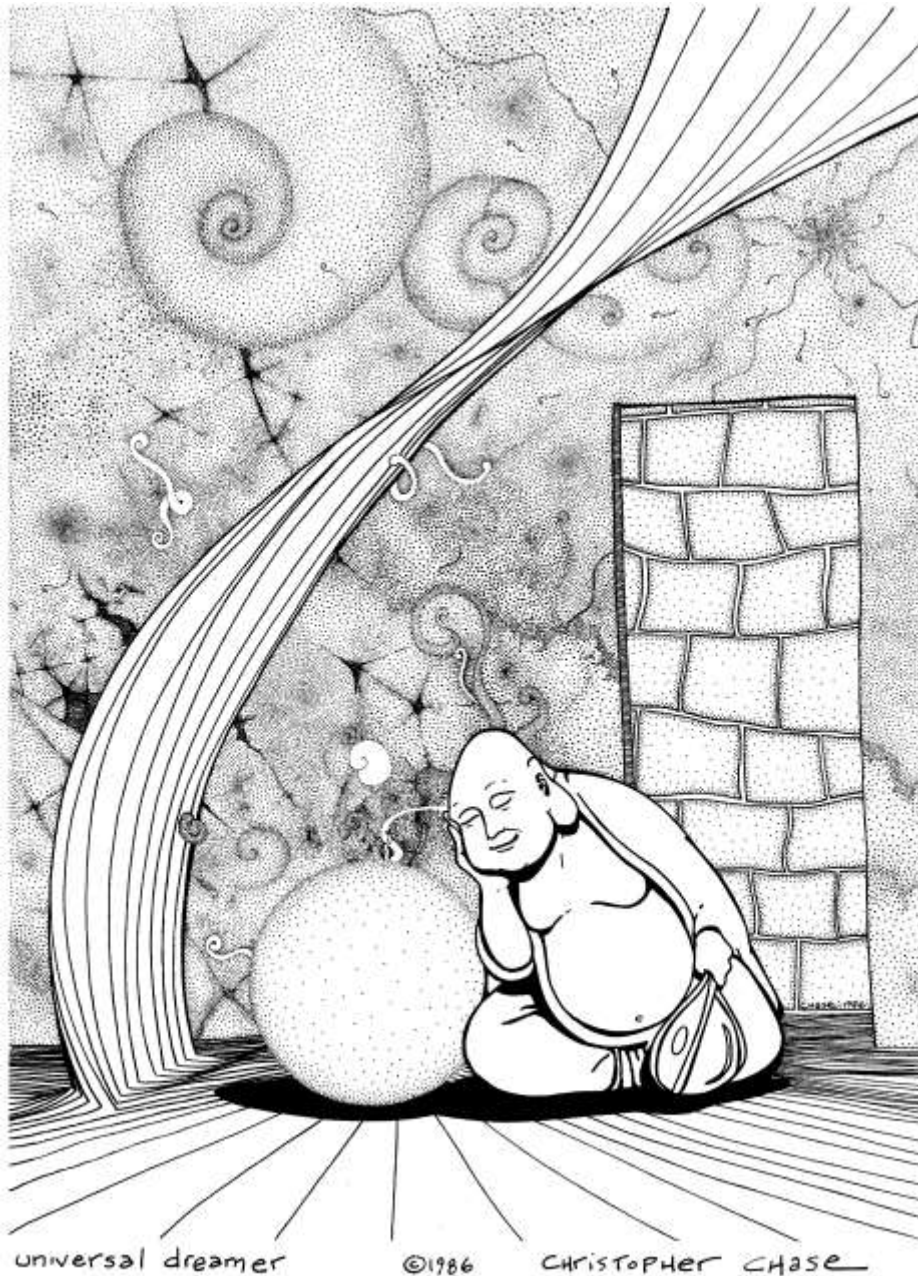
### 1 | A Personal Journey: Evolution of the DST Curriculum Model

My own introduction to the ideas presented here began while I was an undergraduate in college, at SUNY Oneonta. I initially came to experience a sense of deep unity and connection with the Universe in 1983, while studying overseas for a year in Japan, where I learned to meditate and practice mindfulness for the first time. These understandings deepened after reading books about Zen and Buddhism (Hesse, 2000; Herrigel, 1953; Suzuki et al., 1960; Suzuki, 1970). I became deeply aware of how magical everyday life could be.

After that, I tried to represent my experiences—of what some call *unity consciousness*—through my artwork. Inspired by living in Japan, as well as by artists like Escher and Van Gogh, I practiced mindfulness daily while creating pen and ink drawings like the one that follows, attempting to visually represent the unity of all that exists, how everything evolves, changes and flows together as one. This drawing from 1986, entitled *Universal Dreamer*, was one of the first where the deeper symbolism was clear to me while drawing. The door with squares represents compartmentalized human thinking, the flowing lines symbolize water, while the background is meant to evoke the dancing of atoms and self-organizing patterns of cells growing, while the sphere represents the shape of planets, stars and moons;

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Exhibit 2. Illustration by Christopher Chase



After graduating from SUNY Oneonta, I returned to Japan again in 1985, to work as an English teacher, while making use of my free time to meditate, read, and create artwork that represented my experiences of unity and mindfulness. At some point I stumbled on writers that described the correspondence between Eastern wisdom, science and systems thinking, and was fascinated. Alan Watts' book *Psychotherapy East & West* (1961) as well as Fritjof Capra's chapter on "The Systems View of Life" in his book the *Turning Point* (1982), were especially influential.

In 1986, while teaching in Japan, I had an experience one day that changed my life dramatically. I visited a junior high where I met an art teacher who had discovered a way to

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guide and inspire the students in his school to develop their artistic skills. My views about art, creativity and human ability were turned upside down, as until then I thought that artists were rare, that artistic talent was *special* and could not be taught to everyone. Years later, I read Pablo Picasso's observation that *all children are artists*, and learned of a NASA study (Land & Jarman, 1992) which found that 98% of five-year-olds tested as creative geniuses, but this number dropped to 2% by age thirty. Seeing evidence of this on that spring day in 1986, changed the direction of my life. I realized that everyone had hidden creative intelligence and potential, that could be developed if they had life experiences and social surroundings that guided and motivated them.

From that day I became deeply interested in education and the psychology of learning, wanting to understand how motivation works, how skills are mastered and developed. From 1988 to 1993, I studied child development, systems theory and psychology at Stanford University. My primary mentor and advisor, Martin Ford, was a systems theorist, co-editor of *Humans as self-constructing living systems: Putting the framework to work* (Ford & Ford, 1987) and author of *Motivating Humans* (Ford, 1992). I also served as a research assistant with the *Accelerated Schools Project* (Hopfenberg, et al, 1993), an innovative learner-centered education program that collaborated with elementary and junior high school teachers in the United States.

After graduation, I returned to Japan, where I've been living and working since 1994, teaching courses in English to undergraduate students at Seinan Gakuin University and Kyushu University. Initially, my focus was on implementing the knowledge of skill mastery and creative teaching strategies that I'd learned about in graduate school. During this period, I began writing about systems theory and teaching these ideas to my students, developing the DST model presented in this paper.

My observation is that interest in systems science, ecological thinking and systems thinking grew in mainstream culture during the 1980s and 1990s with the publication of books like Fritjof Capra's *The Turning Point* (1982), Peter Senge's *The Fifth Discipline* (1990) and Al Gore's *Earth in the Balance* (1993). While I could be wrong, I felt that this new awareness seemed to decline after the terrorist attacks of September 11, 2001. I was teaching in Japan but had many contacts among educators in the United States, who struggled as innovative interdisciplinary education models that attempted to unify knowledge disciplines, foster learner self-direction, enhance creativity and teach systems thinking were increasingly blocked or constrained by politicians on both the right and the left who supported increased technology in classrooms, curriculum division and standardized testing (Chase, 2018).

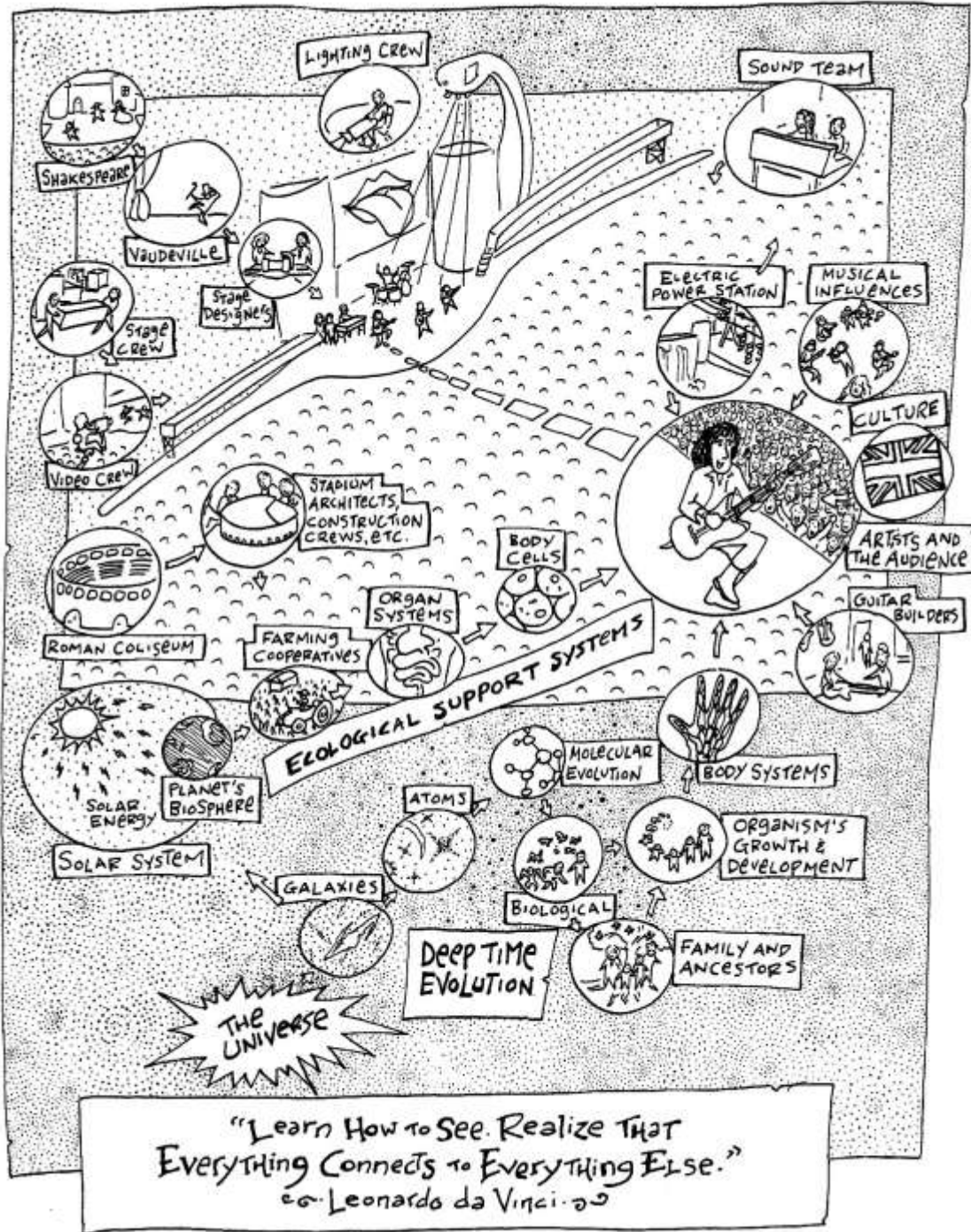
Critical and creative thinking is extremely difficult when learning is no longer hands on and knowledge is disconnected in people's minds. Albert Einstein and David Bohm (1990) described humanity's current situation as a crisis rooted in a technologically advanced civilization shaped by a reductionistic worldview—a mental prison that blocks deeper understanding of nature's laws and how our experiences are interconnected as ecological and interdependent wholes. Zen Buddhist teacher Thich Nhat Hanh (2009, 2016) expressed a view aligned with Einstein's, through his insights about *inter-being*—a deep ecological awareness of the ever-present unity, creativity, and oneness of the natural world that moves and flows within us and all around us.

I first called the DST model presented here *Nature's Paradigm*, sharing the core ideas of systems theory (Chase, 1996a) in *Creative Spirituality Network Magazine*, hosted by Matthew Fox. I even wrote an unpublished essay (Chase, 1997b) explaining systems science through the example of the rock group The Grateful Dead—inspired by experiences at rock concerts where I

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used my imagination to visualize how the concert I was experiencing was connected to human history and the entire Universe, both ecologically (in space) and evolutionarily (in time). I wrote two papers attempting to map out the ecology of human experience (Chase, 1996b, 1997a) and around the same time drew this Rock Concert drawing (Exhibit 3), to express visually the systems science ideas I had been writing about.

**Exhibit 3.** Deep Systems Thinking Rock Concert by Christopher Chase



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Seeing humans as connected to everything else in the Universe requires imagination. Thich Nhat Hanh and Albert Einstein are part of a long line of visionaries across cultures, who have tried to share their understanding of what Ervin Laszlo (1993) describes as a *Creative Cosmos* and Alan Watts (1962) called a *Joyous Cosmology*—expressing a deep feeling of connection to all life and a sense of cosmic community that can be experienced directly by anyone when we use our hearts, senses and imaginations together.

Historically, many cultures—including Japanese Edo society—shared this kind of holistic and ecological worldview. They observed nature and the Universe mindfully, modeling their systems, languages and societies on natural cycles and processes. My view is that the unified systems cosmology of DST can provide a way of meaningfully connecting and organizing knowledge across curricula, as the patterns described here occur on Earth and in the Cosmos (Chase, 2021).

Both Montessori’s *Cosmic Education* (Duffy & Duffy, 2002) and this DST model offer interdisciplinary pedagogical frameworks for integrating and reorganizing current silos of knowledge, thereby providing a sense of deep identity for young people, where they come to understand themselves as connected ecologically to all life on our planet, to their local communities, human history, Mother Nature and the evolution of the Universe. As one student put it, “Before this class, I never realized how much everything is connected. Seeing the natural world and human society as parts of a single system made me rethink my everyday choices. It’s like a web I am part of, and every action I take matters” (Chase, 2020).

### 2 | Five Foundations of Deep Systems Thinking

Below are five key DST curriculum concepts and principles. Many are simplifications and reframings of ideas others have developed. Taken together, these foundations form an integrative framework for understanding how human experience is embedded ecologically within Nature and the Universe. What is distinctive in this curriculum is how these ideas have been made accessible and engaging for young people in Japan, using simple English, visual representations of systems relationships, short videos, popular culture (films, books, music), and real-world examples. The framework itself has evolved through continuous feedback and creative input from students, including class presentations, drawings, and flow diagrams. As one student at Kyushu University observed (Chase, 2020): “Drawing systems was more revealing than reading textbooks. Visualizing processes made abstract ideas concrete. I feel like I can think more clearly and make better decisions.”

#### **Foundation 1: The Universe is Composed of Systems**

A central insight in DST is that everything in the Universe can be understood as a system. Atoms, stars, biological organisms, ecosystems, human societies, and economies are all organized as dynamic systems composed of interrelated parts that form unified wholes. From a DST perspective, humans are a part of the Universe, as much as trees, rivers, mountains, and galaxies. Moreover, many of these systems are highly creative in nature.

#### **Foundation 2: Systems Are Connected Through Flows**

The systems in our Universe are not separate. They are connected through flows of materials, energy, and information. Just as Nature is organized ecologically through interconnected systems and flows, human life and experience are embedded within these larger processes. This leads to

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the insight that the Cosmos is an evolving creative event, where all things are continuously changing and flow into one another.

### **Foundation 3: Systems Change Creatively & Maintain Stability Through Cycles**

Nature's systems are both maintained and changed through cycles. Generation, regeneration, and degeneration are fundamental processes observed across natural systems, from ecosystems to human life. These cycles describe how systems come into being, maintain balance (homeostasis), and break apart, allowing new forms to emerge. What is often experienced as breakdown or degeneration is a natural phase required for evolution and transformative change, where structures and patterns dissolve, so that new forms can emerge.

### **Foundation 4: Living Systems Are Conscious, Creative and Able to Learn**

Human consciousness and experience arise as our minds and biology interact directly with inner and outer worlds, participating in flows of information in much the same way that our bodies participate in flows of energy and materials. Continuous learning is a natural function of living systems. Human beings exhibit high levels of creative intelligence (CI), learning and adapting through direct experience, social interaction, mindful observation, and participation in local environments. As our species evolved on this planet, this learning occurred within local social, cultural, and ecological communities where feedback is immediate and relevant. Imagination plays an important role in learning, helping us construct and refine mental models of complex systems and relationships that impact our lives. When these capacities are constrained, our ability to learn, adapt, and respond effectively to problems is diminished.

### **Foundation 5: Vicious and Virtuous Cycles (Systems Wisdom)**

A particularly important and accessible distinction for human beings is the difference between vicious cycles and virtuous cycles. While systems science uses the term feedback loops, many students find the language confusing. In contrast, the concepts of vicious and virtuous cycles make outcomes explicit. Vicious cycles generate instability, conflict, and suffering through self-reinforcing patterns of unwise action, while virtuous cycles support balance, cooperation, and well-being through patterns that reinforce stability and growth. This distinction connects systems thinking directly with human values, actions, creative problem-solving and lived experience.

Taken together, these five foundations provide my students with a coherent way of understanding both the outer world and their inner experience as interconnected systems. Rather than learning fragmented pieces of knowledge, they begin to see patterns, relationships, and cycles that connect disciplines, experiences, and scales—from personal decision-making to global challenges. In this sense, Deep Systems Thinking becomes not only a conceptual framework, but a practical and experiential way of learning that supports creative thinking, wise action, problem-solving and a deeper sense of connection to the living world.

## **3 | Deep Identity- How We Participate in the Creative Cycles of the Cosmos**

As Alan Watts (1961) explained in *Psychotherapy East & West*, beneath our social personas we are each unique and universal expressions of the Universe—creative works of cosmic art. For those who believe in a spiritual creator, we are children of God, one human family. It's not that our surface identity and diversity are denied; rather, both our differences and shared identity can be celebrated together as living expressions of cosmic creativity.

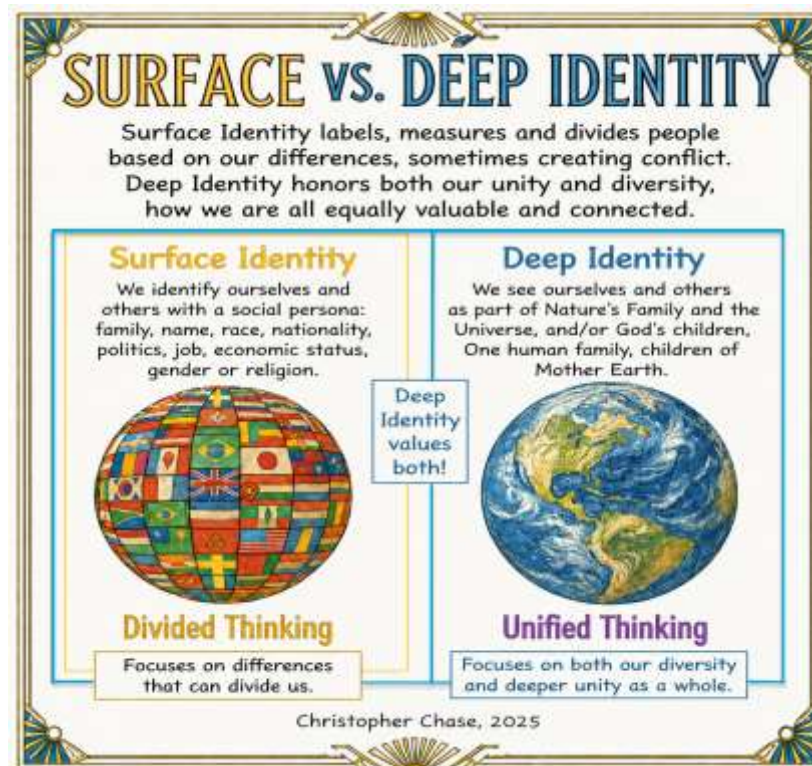
In *The Creative Cosmos*, Ervin Laszlo (1993) explored the implications for human cultures and consciousness—we are not an accidental result of physics, but creative expressions of our Universe growing and evolving. Others describe the generative processes of the Universe

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as *emergence*, where new creations and expressions that had never existed before continuously come into being. In *The Self-Organizing Universe*, Erich Jantsch (1980) explores how evolution is a self-organizing, self-transcending process where new structures endlessly come into being. David Bohm (1980) does not use the term emergence, but speaks instead of unfolding potential—how the whole universe is continuously *enfolding* and *unfolding*.

Many spiritual leaders, philosophers, and artists across cultures and centuries have shared this perspective, a way of seeing humanity that is *inclusive* and unifying rather than *divisive*. Such a worldview has the potential to unite people, generating compassion, gratitude, joy, generosity, friendship and a sense of global community. When we recognize all humanity as one human family, each person can be experienced as a sister or brother. When we see life on our planet as one Earth community, each animal, insect, flower and tree is viewed as a cosmic creation and our relation. Perceptions of deep identity highlight our connection to the evolutionary history of life both on our planet and in the cosmos.

**Exhibit 4.** Surface vs. Deep Identity diagram.



When sharing these ideas with my students, many have been surprised to learn that they live in a Universe that is creative and regenerative by nature (Chase, 2018). Few had thought about how each of us is made of atoms forged in stars billions of years ago, with information coded by Nature into DNA passed forward from our parents and countless human and nonhuman ancestors. From a Deep Systems perspective, each of us is like a new leaf blossoming on the Tree of Cosmic Life, guided by the successful experiments of cosmic evolution over billions of years. In our mother's womb, we grew as self-constructing biological systems built from the

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“stardust” of our galaxy. Considering this deeply can evoke a sense of awe and connectedness with everything.

One student commented, “The idea of Deep Identity impressed me. I realized I am not only an individual but also part of family, culture, and universe. This made me feel both small and great at the same time” (Chase, 2020). Aligned with premodern world views of Asian and Indigenous cultures, students were inspired by a deep systems view of human beings as creative expressions of universal laws, forces, fields and design codes, what some might view as a deep generative intelligence.

In the 1970s, James Lovelock (1979) presented the *Gaia Hypothesis*, suggesting that the Earth’s biosphere functions as a creative self-organizing system that has maintained and evolved life on our planet for billions of years. Is it possible that both Nature and the Universe possess a deep, creative, and regenerative intelligence—one that not only surpasses but also gives rise to our own? Such a cosmological vision was once common sense among many premodern cultures. This idea has also been explored in literature and films like *Avatar*, where Nature is portrayed as a highly intelligent being, and where humans are challenged to evolve our intelligence to live in balance and harmony with the creative intelligence of the Earth—to “co-create with nature’s laws,” as Einstein put it (Hermanns & Einstein, 1983).

This cosmology, rooted in science, aligns with a core insight of many pre-colonial Indigenous and Asian cultures—the idea that Mother Nature is an intelligent and lawful presence that nourishes, regenerates, and supports a great diversity of life on our planet. To do so, Nature continuously transforms and recycles all things Water, nitrogen, oxygen, carbon—every atom of the Universe is recycled over and over—nothing is wasted.

This is how life and death flow together as one, as phases of the Universal Tao, the Way of Nature: endless cycles of generation, regeneration, and degeneration (or decomposition). This awareness of Nature’s cycles has deep roots. In Asian cultures, deep systems wisdom often took the form of religious and philosophical teachings. In China, Lao Tsu taught that there is a universal law of change, what he called the *Tao*. In Hinduism, the *Trimūrti* cosmology describes the powers of creation, maintenance, and destruction as personified by three deities: Brahma the creator, Vishnu the preserver, and Shiva the destroyer. These correspond closely to three natural systems processes we can observe in Nature: generation, regeneration, and degeneration.

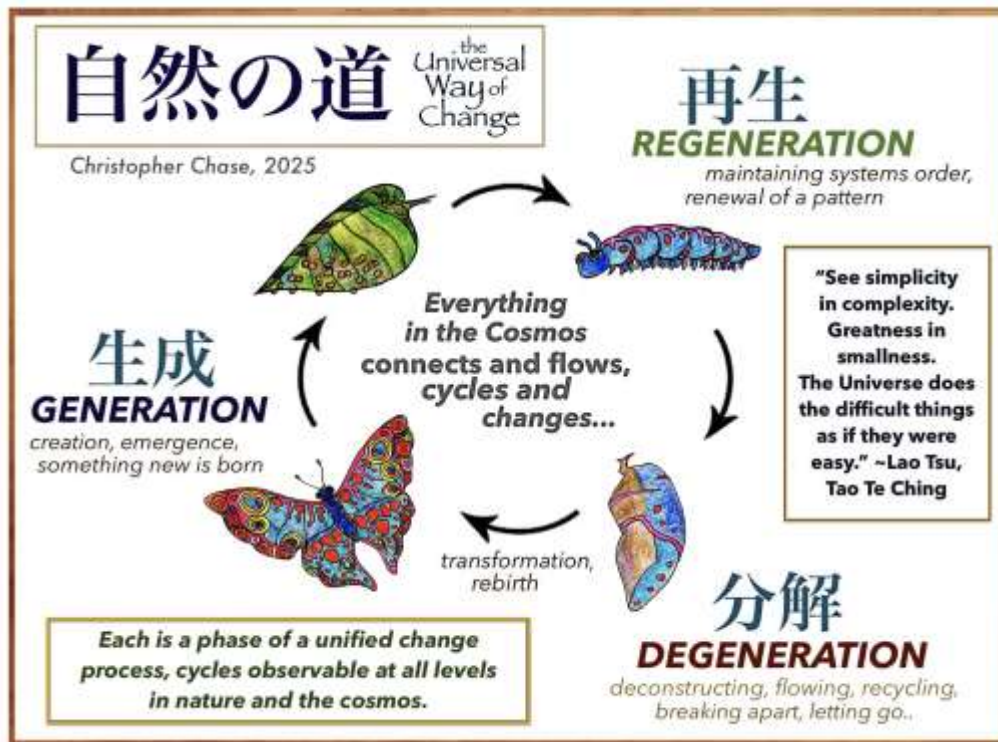
In creative processes we see new forms emerging, growing and evolving. In regenerative processes we see the maintenance of homeostasis in living systems—what we might now call sustainability—where balance, health and harmony are preserved. And in degenerative processes we see the breakdown of old structures, where systems dissolve, chaos increases, and transformative change becomes possible.

Similar cosmological models can be found within Buddhism and Indigenous cultures, where everything in the Universe is understood as arising, growing, breaking apart and flowing together as one interconnected whole. Central to these traditions is the insight that wisdom arises when human beings align their communities with Nature’s Way (自然の道), letting go of ego-centered bias and harmful ways of thinking.

When I introduced these insights about Nature’s cyclical processes to my students, many immediately connected them to ideas already present in Japanese language, poetry, art and culture. Cycles of generation (生成), regeneration (再生), and degeneration or deconstruction (分解) were something they were already intuitively aware of.

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Exhibit 5. The Universal Three Phase Cycle of Nature.



Seasonal celebrations of new life in spring with cherry blossom festivals, summer celebrations of children's growth with colorful carp flags, and autumn viewings of falling leaves were experiences they had observed and participated in, since childhood. Looking at traditional arts education, they realized that Japanese people in the past practiced and applied systems thinking in creative ways. Moreover, many have practiced traditional Japanese arts such as archery, kendo, karate, and tea ceremony, where letting go of emotional reactivity and negative self-referential thoughts is part of the training.

Unfortunately, mainstream politics, economics, education, medicine and media do not often view Nature's cycles in this way. Our modern global civilization compartmentalizes knowledge and is largely organized around money, status, and technology, with systems of commerce and production that tend to ignore the unity of creative, regenerative and degenerative processes in Nature. As a result, we ignore the natural cycles and laws that provide social, psychological, and ecological stability (Capra, 1982; Lent, 2021; Wahl, 2017). We model our economics on machines rather than Mother Earth's recycling processes, thereby generating toxic waste, destroying forests and mountains, killing off species, polluting rivers and oceans, and treating fellow humans as expendable cheap labor in order to maximize profits and reduce production costs.

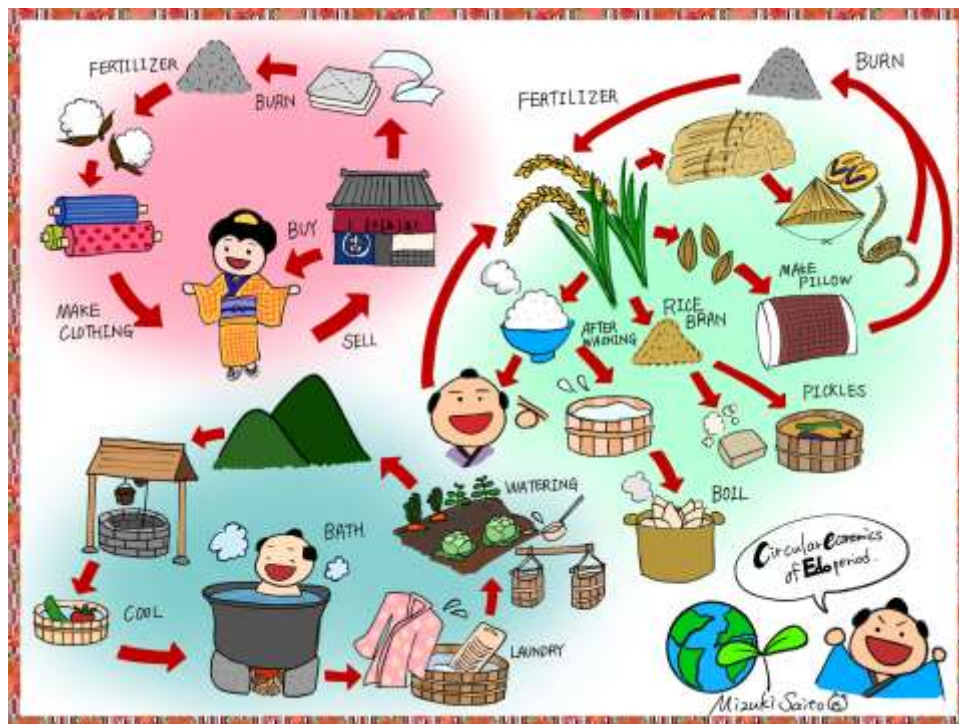
Buddhists describe this deluded state of consciousness as *samsara* (Watts, 1961). Some Indigenous traditions describe this condition as *wetiko*, a kind of collective psychological imbalance, where technologically advanced humans have lost awareness of our deeper identity as children of Nature—becoming blind to how everything and everyone on our planet is connected as one Earth Family. Being more aware of how we participate in Nature's cycles

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becomes essential for restoring balance, because the models of reality modern humans create in our minds and societies either support stability and regeneration or lead to instability and harm.

At Kyushu University, one of the students created this diagram for her team's presentation on the regenerative economic model of the Edo period, before the modern age (see the student-created diagram below, illustrating circular economic systems during the Edo-period). Concepts that can seem abstract in modern systems science were, for many of my students, already familiar ways of understanding how systems can be organized, how learning happens and change unfolds in the world.

**Exhibit 6.** Student drawing of circular economic systems during the Edo-period



### 4 | Creative Wisdom and Buddha's Distinction: Virtuous vs Vicious Cycles

The ideas above point to a central insight about systems thinking in my curriculum, first articulated by a number of my Japanese students in their class reports. They distinguished between *vicious cycles* and *virtuous cycles* as a way of recognizing systems that were in balance versus those that were not. I then started to incorporate this student-generated insight into my teaching, and noticed a significant increase in comprehension and interest. I believe this is because such a distinction is already embedded in Buddhism and the worldviews of many Asian cultures.

Systems science typically uses the term *feedback loops* to describe such cycles, but many students find the terms *positive* and *negative* feedback confusing, since a positive feedback loop can create either stability or instability. While these terms describe whether effects are amplified or dampened, they do not distinguish whether the outcomes are beneficial or harmful. In contrast, the Japanese terms for vicious cycles (悪循環) and virtuous cycles (好循環) make these differences explicit and are immediately clear for students, connecting systems thinking more directly with human values, actions, and lived experience. This distinction has been present in

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Japanese cultural understanding for centuries and is central to what Buddhism teaches: virtuous cycles are maintained by repeated patterns of wise action and positive outcomes that reinforce balance, stability, and well-being, while vicious cycles of instability and suffering arise when our values and actions are harmful or unwise.

**Exhibit 7.** Buddha's Wisdom: Virtuous vs. Vicious Cycles.



I believe that this distinction reflects a basic form of systems thinking and *perceptual wisdom* found not only in Buddhism, but in many languages and cultures around the world. It points to an understanding that thoughts, emotions, and actions leading to beneficial outcomes tend to support and stabilize systems, while those leading to harmful outcomes generate feedback loops that amplify conflict, and instability. Often, vicious cycles are perpetuated when people fail to let go of thoughts, emotions or actions that are causing harm. In Buddhist thinking, letting go of conflict-producing psychological patterns leads to growth and stability, while holding on leads to suffering. One student explained this insight simply: “The idea of vicious and virtuous cycles helped me see my own habits differently. I noticed how my stress created more stress, but also how kindness could spread kindness. This was very practical and not only theory.” (Chase, 2020).

In one of the courses I teach, we study the film *Freedom Writers* (Gruwell & The Freedom Writers, 1999), which depicts the experiences of a high school teacher and her students in Los Angeles. In the book and film, the teacher Erin Gruwell helps a class of teenagers living in poverty transform their self-perceptions, social relationships with peers and attitudes toward learning. At the beginning of the film, the students self-organize by race and are in constant conflict with one another, both inside and outside the classroom. Some use drugs or commit crimes, and many have little hope for the future.

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Over the course of several years, Gruwell facilitates a sense of community in her classroom. As students develop social awareness and trust, they begin to collaborate creatively on shared projects. They let go of anger and prejudice, start to enjoy learning, and experience a renewed sense of hope for the future. What becomes visible through this transformation is a shift from *vicious cycles* of conflict, fear, and disconnection to *virtuous cycles* of trust, cooperation, and shared purpose. I created the illustration below while teaching this course, using the framework of vicious and virtuous cycles to explore similarities between what we observed in the film and social conflicts in the wider world.

**Exhibit 8.** Love vs. Hate diagram.



Understanding the destructive power of vicious cycles helped my students gain insight into why so many problems in the world—such as addiction, war, poverty and crime—continue to exist. These are not random events, but rather arise from beliefs, emotions, social values and actions that generate self-reinforcing feedback loops of instability within human and natural systems. Seen in this light, the patterns observed in a single high school classroom reflect dynamics that apply to the regenerative maintenance of systems at all levels.

This brings up another insight that my students find useful: the idea of creative intelligence (CI) as a property of both people and Nature. In Western cultures, humans are often seen as intelligent, and in some religious traditions this is extended to the idea of a divine creative intelligence or spiritual creator. However, many cultural traditions take a different view. In Taoism, the Tao describes the way of Nature, while in Buddhism, dharma refers to underlying principles that govern how the world works. These are not described as conscious in a human sense, but as universal patterns, principles or laws that maintain balance and order in the Cosmos.

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Learning that guiding principles of creativity and balance operate at all levels in the Cosmos is inspiring for young people. Atoms, stars, families, communities, biological systems, ecosystems and economies all depend on dynamic stability and homeostasis to function. When this balance is disrupted, systems can shift into degenerative cycles that lead to increasing disorder, conflict, or collapse. News reports around the world provide daily examples of this. This is why creative wisdom, intelligence and systems thinking is so important, especially in the 21st century.

In recent years, I have started to teach with the book *The Little Prince* (de Saint-Exupéry, 1943/2000) in some of my classes. The simple wisdom of this story—about a child’s imagination and the connection of hearts between humans and non-human species—aligns with the systems concepts and understandings we explore together. The fragmented and trivial way some adults think is clearly at odds with the more creative, intuitive and compassionate ways of the child in the story. This classic teaches that perceptions can shift rapidly when we see the world with our hearts and imaginations, connecting what we had thought were separate or unimportant in personally meaningful ways.

What becomes immediately clear for most of my students is the cause-and-effect relationship between our thoughts, actions, and outcomes. What Buddha taught about human psychology is also true for biology, ecology, human society, and the global economy. Unfortunately, modern high technology societies often encourage compartmentalized thinking, where cause-and-effect relationships, deep interdependence and creative intelligence are overlooked. This generates what might be called a *wisdom deficit*—a crisis of disconnection that can generate vicious cycles in people’s lives and society as a whole. Problems such as racism, war, inequality, and ecological destruction are rooted in this fragmented way of thinking (Bohm, 1990).

A number of modern systems thinkers have developed frameworks that support this kind of understanding. Derek Cabrera’s DSRP model (Canales et al, 2023) highlights the importance of making clear distinctions, recognizing relationships, understanding systems, and becoming aware of perspectives—all of which are essential for seeing how helpful or harmful cycles form and how they can be changed. Donella Meadows (2008) identified some of the most powerful ways to influence systems, including shifting the paradigm out of which a system arises or transcending it altogether. This insight closely parallels practices found in Buddhism and other contemplative traditions, where mindful observation allows us to recognize patterns of thought and behavior clearly, and compassion helps guide wise action.

In this sense, changing a system is not only about external structures, but also about transforming the human values, mindsets, and awareness that drive behavior within the system. In Asian cultures and philosophy, shifting mindsets is often understood much as it is presented in *Freedom Writers* and *The Little Prince*, in that for humans to act wisely, cognition needs to be paired with social and emotional intelligence, the activation of loving kindness, empathy and compassion. Joanna Macy (1991a) incorporated this wisdom in her writing, exploring how rigid and destructive systems can be transformed through deepening shifts in perception, compassion and collective action. Along with Alan Watts (1961), Macy explored the connection between systems thinking, mindfulness practices and Buddhist understandings about the interconnection of humans with nature, where everything flows together as one.

Zen teacher Thich Nhat Hanh described this deep interdependence as *inter-being*—the idea that everything exists through relationships and exchanges with everything else. As he put it,

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“if you really touch one thing deeply, you touch everything else.” This way of seeing reflects a form of deep systems awareness that is equally poetic, scientific, mysterious, and experiential.

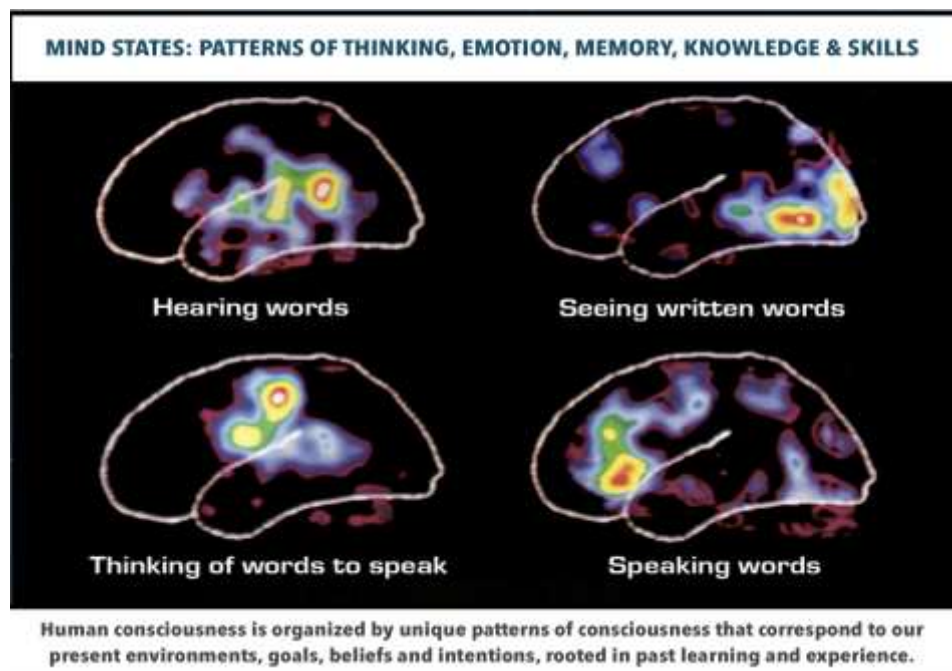
Seen in this light, systems thinking is not new. It is a rediscovery, in modern language, of insights that cultures around the world have long passed forward as core human wisdom—understanding that our thoughts and actions generate systems cycles, and that these cycles can either support life or undermine it. This awareness has important implications for how humans live and learn, how we teach children, and how we design civilizational systems that either reinforce harmful cycles or support human growth, creativity, wisdom, balance, empathy, and well-being.

### 5 | The Ecology of Human Experience – Creative Consciousness in a Living Universe

When teaching young people in Japan, the importance of celebrating their personal lives and experiences as human beings embedded in the history of the cosmos has been central to my courses. As we explore different topics together, they become aware of the unity of *subjective* and *objective* knowing, and of how human experience arises as our minds and biology interact ecologically with the world. In this sense, consciousness is not separate from life—it is the direct experience of being alive within Nature’s living landscapes and countless systems.

In recent decades, brain imaging research has provided even greater detail about what Gregory Bateson described as the *ecology of mind*, showing us how the human brain generates self-organized patterns of consciousness and experience (Ford, 1987; Chase, 1996b, 2000). Our inner landscapes of consciousness are neither random nor fixed, but rather organize and re-organize continuously as structured and dynamic psychological patterns, or *mind states*. These images below are PET (Positron Emission Tomography) scans taken by Marcus Raichle (Ronan, 1993), showing four distinct brain activity patterns associated with different language processes: listening, reading, thinking, and speaking.

**Exhibit 9.** Mind states PET scans by Marcus Raichle.



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Each image represents a different “state of mind,” revealing how the brain reorganizes itself depending on our context and what we are doing. As our environment, emotions, and intentions change, different cognitive states are activated, shaping how we perceive, think, and behave (Ford, 1987; Chase, 1996b). While awareness is continuous, our mind states change and shift throughout the day. These brain patterns—described by Donald Ford (1987) as *behavior-episode-schemata* (BES)—function like software applications that are activated in response to the present environment, providing us with the skills and knowledge we need in a given moment. Each of us has developed hundreds or even thousands of these context-specific patterns over time, constructed through decades of experience, observation, and practice. Driving, cooking, singing, dancing, working, walking, reading, listening— each activates a different internal pattern of skills and consciousness, accompanied by specific emotions, memories and feelings.

This research supports what Eastern spiritual traditions have understood for thousands of years, providing a powerful visual representation of the inner *ecology of human experience*—where changing environments, tasks, values, and intentions activate different patterns of consciousness. It points to a key insight observed by long-term meditators: that consciousness self-organizes as *mind states*—dynamic patterns of thinking, emotion, perception, and sensation that shape our experience and shift throughout the day. Rather than a single, fixed “mind,” human consciousness can be understood as a constantly changing inner landscape—like clouds in the sky or a flowing stream—continuously reorganizing itself in response to changing conditions (Nhat Hanh, 2019; Suzuki et al, 1960; Suzuki, 1970; Watts, 1961).

Human consciousness can be understood as a psychological, biological, social, cultural, and ecological phenomenon—where inner and outer systems are unified (Bateson, 1979; Suzuki, 1970; Watts, 1961). Every living being experiences the Universe in a unique way, embedded within Nature’s systems. Just as materials and energy flow through our biology, the senses of humans and other animals are plugged into complex flows of information (Ford, 1987). Once we are born into this world, our senses are flooded with information and conscious awareness arises, with each being *experiencing* life from the unique perspective of the biological form we inhabit on this planet (Suzuki et al, 1960; Suzuki, 1970).

Understanding this inner ecology of our minds has profound implications. What we call learning is essentially a process of constructing context-specific skill and knowledge patterns over time. Every child is born with the potential to develop countless configurations of skills. Unlike Neo in *The Matrix*, human skill and knowledge patterns cannot be downloaded; they must be built through practice, experimentation, observation, and participation in the world.

Many of these cognitive schemas are supported by *mental models* and maps—visual/spatial representations that shape and guide how we perceive and respond to the world (Chase, 2021). Memories are mental models, as are the steps for baking a cake, building a house, or visualizing a road while driving. People also construct mental maps and visual representations for subjects like physics or biology, as well as models that generate bias—such as holding a negative and dehumanizing stereotype of people from certain ethnic or racial groups.

When our mental models are fragmented or inaccurate, our thinking becomes shallow, limited and obscured. Deep systems thinking and wisdom require coherent and unified mental models—representations that reflect *real* ecological relationships, processes, cycles, and connections in the world. These allow us to see the “big picture” of a situation rather than partial or distorted views. This is where mindfulness and imagination become essential for unifying what had been fragmented or obscured.

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By mindfulness, I am referring to what Buddha described as *right concentration*, a state of calm and open awareness of sensory input that is not filtered by emotions, concepts or prejudicial perceptions. Mindfulness helps us observe the world directly, reducing distortion from bias, habit, and cultural conditioning (Nhat Hanh, 1999; Suzuki, 1970; Wahl, 2017), while imagination allows us to construct and update accurate cognitive representations of complex systems relationships and dynamics. Together, they enable us to learn and relearn continuously, evolving our skills and knowledge so that we can construct realistic and unified mental models of the contexts we inhabit.

Mindfulness helps us move past the *rigidity trap* of the adaptive change model (Wahl, 2017). By staying open to new information—letting go, changing, and questioning the status quo—we set regenerative cultural change and transformative *breakthroughs* in motion. At first, letting go of tightly held beliefs or feelings might feel like chaos, but in fact this is Nature’s way—a natural process required to dissolve and transform harmful patterns both within our minds and out in the world. In this sense, what we often experience as *breakdown* or degeneration is not simply negative, but an essential phase in the cultivation of wisdom, where outdated patterns are released and new understanding can emerge.

This reflects a key insight in Taoist and Buddhist thought, echoed in Joanna Macy’s concept of the *Great Turning* and Donella Meadows’ work on leveraging systems change, where shifts in mindset and paradigm are central to the development of clarity, balance, and well-being. This also aligns with the “holy curiosity” that Einstein suggested we never lose, an awareness that human consciousness and worldviews must continuously change, evolve, and grow.

This approach is not new. For young children, this openness to the world comes naturally, while artists and contemplative traditions have long understood that careful observation combined with imagination reveals deeper structures in reality. Leonardo da Vinci embodied this approach. As a child, he spent long periods studying nature carefully and directly—drawing, observing, and learning directly from the living world around him (Isaacson, 2017). These experiences with Nature strongly influenced da Vinci’s belief that science and the arts are complementary ways of seeing interdependence in the world—ways that together reveal how “everything connects to everything else.”

My own journey as an artist and systems science educator follows this tradition, using visual models and examples to represent complex systems distinctions and relationships in accessible ways. In my experience, the saying “a picture is worth a thousand words” is often true. On the next page is one of the first systems drawings I created in 1993, while working with junior high school students in California. They had been studying biology and earth science, memorizing parts of systems, but struggled to understand how these systems were connected together.

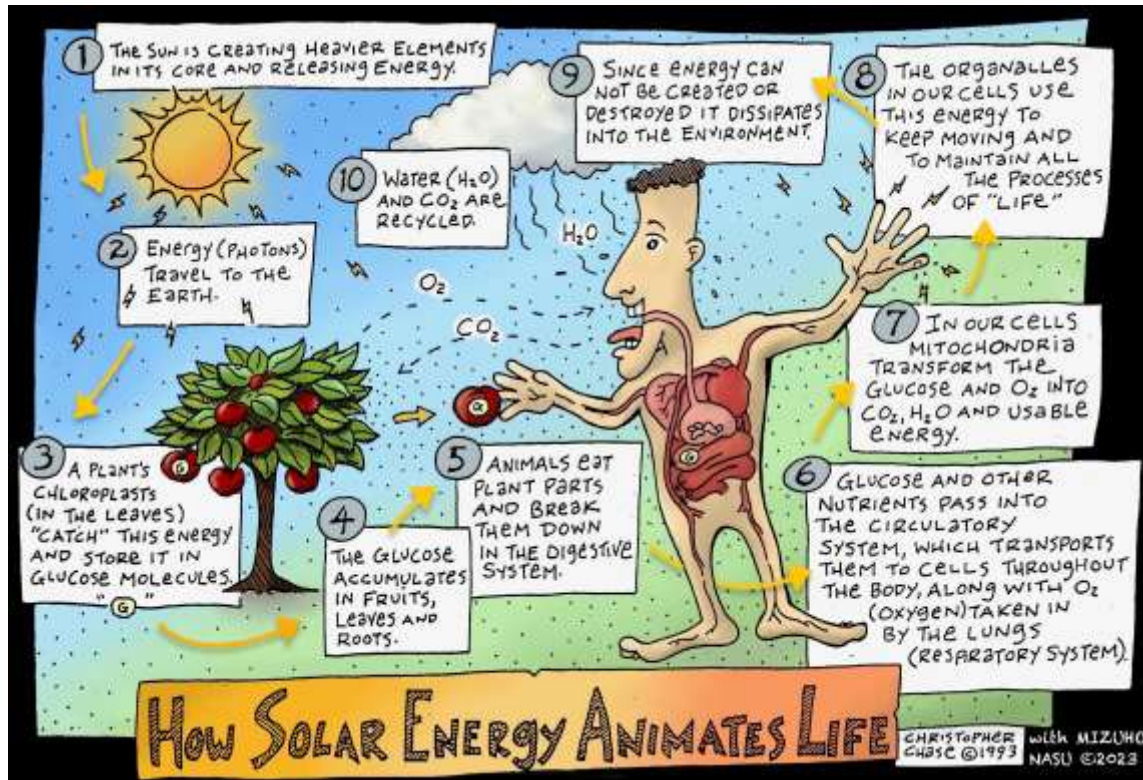
To help them get the “big picture,” I created this drawing showing how solar energy flows through plants, animals, and human biology—linking the different systems had studied separately. When students saw this, they were amazed (Chase, 2021). They had memorized the names of parts as isolated facts, but had not understood how these parts were connected together within them, or how deeply they were embedded in Nature’s systems. This moment revealed something very important about learning that has informed my approach to teaching ever since: deep understanding emerges when connections are seen, not just when parts are memorized.

When we construct coherent models of systems relationships and processes in our minds, these cognitive representations function as an internal guidance system, helping us navigate complexity effectively. Practiced together, mindful observation and imagination help us to see

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the regenerative principles that create order and counterbalance entropy, as Buckminster Fuller (1981) described, while also understanding the essential connections that allow us to see the whole.

**Exhibit 10.** How solar energy animates life drawing by Christopher Chase.



Across cultures and throughout history, humans have developed deep understanding by closely observing Nature and aligning their lives with her processes. Thich Nhat Hanh (2016) expresses this perspective succinctly: Mother Earth is within us, not only around us. When we look deeply, we can realize that we are not separate from Nature—that our bodies, our history, and our consciousness arise from and are continuous with the living systems of the Earth.

### 6 | Aligning Schools with How Children Naturally Learn

Understanding the ecology of psychological processes and experiential learning could have a profound impact on modern education and schooling. The mind states, skill patterns, and mental models we construct to represent objective reality do not arise fully formed—they are built over time through the countless interactions and experiences children have in schools and with the worlds they live in. Understanding how our minds change and grow is essential for designing education systems that help young people think critically, creatively and deeply, nurturing their potential and the mastery of useful skills (Chase, 2018a, 2018b; Comer, 1988; Hopfenberg et al., 1993).

As mentioned, the human brain can be understood as a *creative learning system* that constructs and evolves meaningful understandings, knowledge, and skills over time (Chase, 2000, 2018a, 2021). Throughout history, effective learning methods—such as apprenticeship and

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community-based learning—have aligned with how the brain naturally develops mastery through repetition, observation, social interaction, and practice (Chase, 2018a).

Critical to successful learning is motivation. As we have seen, mind states and behavior-episode patterns include an emotional dimension, which can either fuel learning or destabilize it (Chase, 2018b; Ford, 1992; Ford & Lerner, 1992). Csikszentmihalyi (1990) coined the term *flow* to describe the highly pleasurable state of consciousness where skills are well matched with the challenges. This mind state is intrinsically rewarding. When learners experience flow, they are naturally motivated to practice and master complex skills (Chase, 2000, 2018a). Maria Montessori (1970) understood this, noting that “one test of the correctness of educational procedure is the happiness of the child.”

Carol Dweck (2015) describes the motivational pattern that guides creativity and mastery as a growth mindset. It’s a way of experiencing challenges as opportunities, viewing mistakes and errors as experiments—a natural part of the mastery process. Self-directed learners who master skills discover this on their own, harnessing the brain’s intrinsic capacity for flow experiences and perpetual skill improvement. Many highly creative individuals developed their talents in this way, often without formal schooling. Van Gogh taught himself to paint. Bob Dylan and the Beatles learned through listening and practice rather than formal training. Malcolm X educated himself through reading in prison. In each case, high levels of mastery were driven by deep engagement, enjoyment and curiosity (Chase, 2014).

Unfortunately, modern systems of education that emphasize standardization and testing can undermine creativity, growth mindsets, flow consciousness and the natural mastery learning process. When students are ranked, compared, and frequently corrected, many develop a *fixed mindset* (Dweck, 2015), losing confidence and becoming less willing to take risks. This destroys intrinsic motivation, shifting learning away from curiosity and mastery toward performance outcomes and fear of failure.

John Dewey (1938) described such experiences as *miseducative*, generating negative emotions and anxiety that children then come to associate with schools and learning. When emphasis is placed on testing and social ranking, only a small percentage are labeled exceptional, while many come to see themselves as average or inferior. Negative emotional patterns can then become self-reinforcing, shaping long-term attitudes toward learning and adults who present themselves as authorities.

Research into successful education reforms indicate that many problems in modern societies are linked to systems of schooling that exacerbate vicious cycles of poverty and social inequality by undermining motivation in children who are assessed and ranked as failures (Comer, 1988; Hopfenberg et al., 1993). This is what high school teacher Erin Gruwell discovered (Gruwell & The Freedom Writers, 1999), as depicted in the film *Freedom Writers*. While intended to measure achievement, these systems often suppress creativity, discourage collaboration, and undermine confidence in many learners, while inflating ego in others (Chase, 2018). In this sense, educational structures themselves can generate either virtuous or vicious cycles in human development, depending on the environments they provide and the pedagogical models that guide assessment.

Another major issue (at the center of this presentation) is the compartmentalization of knowledge into isolated subjects and parts, where the focus is on memorizing information without understanding relationships. This prevents learners from seeing the larger systems they are part of and that make up the world. One key purpose of the curriculum presented here is to provide an organizing framework that makes the ecology of human experience visible.

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Montessori's concept of Cosmic Education reflects a similar goal—helping students see how all human knowledge fits together as a unified whole (Duffy & Duffy, 2002).

My experience has been that providing meaningful and engaging curricula is not difficult. When students are shown how systems flow together and function—especially how vicious cycles can be transformed into virtuous ones—they quickly develop deeper understanding and interest. They begin to see patterns across disciplines, in their own lives, and in the world around them. Problems are no longer viewed as isolated or overwhelming, but as dynamic systems that can be understood, changed and improved. Education, in this sense, becomes not just the transfer and testing of knowledge, but an awakening to how they are creative beings living in a creative Universe—and that they can find wisdom within Nature for how to work together with others to solve problems and contribute to a more balanced and sustainable world for future generations on our planet.

### Conclusion

In this article, I have described the systems science curriculum model that I have been developing and teaching since the 1990s. Over the years, my students have shared insights and ideas, helping me craft a flexible and meaningful curriculum that unifies the arts, humanities and sciences, that shows how to solve problems creatively and effectively by understanding the natural balancing mechanisms within systems. The “good news” from both ancient wisdom traditions and modern systems science is that quite often the simplest way to solve a problem is to reduce destabilizing factors and strengthen the natural conditions that allow balance and stability to emerge.

The deep systems perspective shared here echoes the perspective of pre-modern Asian, European, African and Indigenous cultures of the past. It challenges several core beliefs of Western mainstream cultures, that spirituality, the arts and science are disconnected, that humans exist separate from Nature, and that *we* are the most intelligent life forms on this planet, while Nature is not. In the words of one student (Chase, 2020), “Through this class I realized that everything in the universe is connected, not only physically but also emotionally and spiritually. I used to think science and spirituality were separate, but now I feel they are describing the same truth in different languages.”

A key insight across cultures and time is that Nature is an intelligent and lawful system that nourishes, supports, transforms and regenerates life on our planet. This ecological and relational way of thinking views disorganization as a natural phase of the cycles and dynamics underlying creative change. The idea of creative intelligence (CI) may be especially useful at this point in history. Reconceptualizing intelligence in this way can shift attention beyond human-centered and technology-centered views toward the deeper intelligence present in Nature's systems and throughout the Universe. Likewise, awareness of vicious and virtuous cycles helps us recognize where instability is being reinforced and where change is needed to restore balance. In this way, systems awareness and creative intelligence work together: one reveals the patterns that cause instability, the other enables us to reshape them in wise and creative ways.

What I describe in this presentation is not a new way of thinking. A great many poets, philosophers, artists, scientists and spiritual teachers have shared this understanding, and yet its impact has been weak in modern societies, where much of the focus has been on technology, politics, surface identity and money. We could call this way of thinking ecological consciousness, ecological systems thinking, holistic thinking, whole systems thinking, unified systems thinking or unity consciousness—these are all equally valid names for what I call *deep*

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*systems thinking*. All point to a deep and integrated way of seeing the world that is rooted in wisdom, imagination and compassion.

For over thirty years, I have seen how young people appreciate learning how the disconnected information they have been studying in schools connects together in meaningful ways, that the cycles and laws of the universe apply to their own personal lives and experiences as much as to stars and ecosystems. When given time to explore these ideas together, their understanding often deepens significantly, suggesting that how we learn is as important as what we learn.

In Nature's systems, power and responsibility are distributed. The implications for human beings is that meaningful change must emerge locally, at the level of cultures, communities, families, and states of consciousness. Seen in this light, solutions to many of humanity's most persistent problems—such as poverty, addiction, war, crime, and family violence—depend not only on decisions made by those in positions of authority, but on supporting people everywhere to understand how their minds work, how to develop essential skills, work together with others, and express their innate creative intelligence.

As Einstein advised, to understand everything better it is best to look deeply into the Universe. The guidance we seek is already there, within us and all around us. We just need to align with Nature's systems and the mysterious intelligence that has brought us all into being.

**Exhibit 11.** Nature's Systems by Christopher Chase.



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### Acknowledgments

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