Creating Sustainable Learning Communities for the 21st Century

Building on discoveries in fields as diverse as quantum physics, chaos mathematics, evolutionary biology, neuroscience, cognitive science, and systems theory, revolutionary insights about the universe, the natural world, and human learning have all converged into a new understanding of how human systems continue to grow, evolve, and learn,(change). Although these disciplines seem either remote from or irrelevant to designing and leading twenty-first century organizations, the new learning they provide allows us to reconceptualize the language and professional discourse of organizational learning and leadership and to discard the cause-and-effect mental models that have grounded them in the past. Behavioral algorithms do not govern the dynamics of organic living systems.

To prevail in the face of the *dis*ease and *dis*organization of the twentieth century workplace requires new organizational forms, new visions of leadership, and new metaphors for organizational growth and change that are grounded in the hopeful and enduring characteristics of the natural world, the human spirit, and the brain itself. Although this article focuses on the principles and conditions governing the creation of robust, resilient and dynamically sustainable learning communities within the structures currently called schools and classrooms, they apply to *any* learning enterprise. Every organization must become a generative learning and teaching community if it desires to enhance the fullness and diversity of human capacities.

All around us, we see evidence that we are in the midst of a cultural transformation, fueled by the recognition that the competition, independence, and isolationism of the past cannot elevate the capacities of the human spirit that will energize and guide us in the next phase of our development as we create new ways of being together in the world. Human interdependence, not independence, will be the foundation for a new global civilization, one that will require new mental models and structures for learning.

THE CRISIS IN LEARNING

For well over a decade we have been barraged with reports and rhetoric about the crisis in public education. It is my belief, however, that the espoused crisis in public education is predominantly a crisis about learning and it is fundamentally grounded in the dynamic integration of two new domains of inquiry:

1. The paradigm shift from a machine-based "clockwork" conception of the universe to the complex adaptive system perspective.

2. The paradigm shift from understanding the brain as a computer to be programmed and learning as a linear process of information accumulation to understanding the brain as a dynamic, self-organizing neural network and learning as a natural, active, and messy process of pattern formulation and constructed meaning.

Inherent in the old mental models are three mechanistic metaphors that have historically contextualized our view of schooling and learning: universe as clock, brain as computer, and learning as tabula rasa (blank slate). The insights of complex adaptive system theory and learning theory have fundamentally altered these metaphors and have radically reframed the discourse on learning and schooling; in place of machine-based metaphors are fluid, organic and biological metaphors that place current schooling structures in dynamic opposition to our new knowledge.

THE CREATION OF "CLOCKWORK" ORGANIZATIONS AND SCHOOLS

The way that scientists view the dynamics, patterns, and relationships of the universe and natural world has profound implications for how we construct our world. As a consequence, we shape, organize, and direct our institutions according to the science of our times. For three centuries, the dominant scientific worldview was the image of a static, repetitive, predictable, linear, and clockwork universe. This Newtonian worldview seemed to create an obsession with linear thinking and encouraged the escalation of an almost exclusively rational trajectory that has controlled and defined almost every dimension of our cultural and organizational life, including our schools.

As leaders, we focused on predictive cause-and-effect models of human learning; we became preoccupied with things and efficiently managed our organizations and our schools by reducing them to discrete, observable and measurable parts. Deriving our insight from Newtonian science, we behaved as if we actually believed that by understanding the parts we would discern the behavior of the whole, and that analysis would inevitably lead to synthesis. We may have thought that the structure of our current educational system was derived from the principles of Frederick Winslow Taylor and Adam Smith and the needs of the nineteenth-century industrial revolution; however, it is even more fundamentally rooted in seventeenth-century science and false conceptions of how the brain works and learning occurs.

In alignment with the clockwork, mechanistic metaphor of schooling, we embraced an erroneous and dysfunctional paradigm of learning based on the following assumptions:

- Education is passive and incremental, not dynamic and developmental.
- Learning is acquired information, not constructed meaning.
- Intelligence is a fixed capacity and is not learnable.
- Potential and capability are finite and not capable of being enhanced.
- Learning is defined by the calendar and the amount of time one stays on task and not by demonstrations and what David Perkins calls "performances of understanding."
- Content coverage and reproduction are more important than genuine understanding.
- Rote memory is "better" than spatial memory.
- Prior knowledge is unimportant to future understanding.
- Content segmentation is more highly valued than concept integration.
- Reliable evaluation can only be objective and external not qualitative and self-adjusting.
- Competition is a far more powerful motivator than cooperation.

By design, we constructed and operated our Newtonian schools as we understood our world, and this produced iatrogenic and learning-disabled institutions that have suppressed reflective thought, creativity, and the innate and inexhaustible human capacity for lifelong growth. The unexamined application of Newtonian laws to complex adaptive social systems diminished our capacity for continuous growth and change because it diminished our capacity to "grow" the individual and collective intelligence, energy, spirit, and hope of the whole system.

We had designed a linear system based upon predictive models of change and a belief that learning was incremental, when in fact human systems, like most of nature, are not predictable; change is nonlinear and learning is dynamic and patterned. Human beings do not follow the logic of cause and effect. We crave connectedness and meaning, we seek lasting and deep

relationships, we grow by sharing and not by keeping secrets and we need to trust and be trusted in order to feel safe enough to dare. If we want to create learning communities that continuously renew and reintegrate themselves toward higher levels of complexity, we must ground our organizational transformation and our leadership in the science of our times and we must create conditions for the purposeful and soulful engagement of people in their work.

A NEW LEARNING COVENANT

The turn of the twentieth century brought the linear and mechanistic worldview to an end and heralded the conception of an ecological universe -- a holistic, dynamic, and inextricably connected system in which everything seems to affect everything else. Furthermore, the last two decades have produced revolutionary new insights about how human beings learn and how we can best create environments that accelerate our natural learning processes. These new insights come at a time when we are beginning to experience some of the transformational power of information and communication technologies.

Because knowledge is doubling at a remarkable rate, the structures (schools) and strategies historically used to deliver that knowledge in prescriptive and linear ways are now being challenged by knowledge-based institutions that recognize the need for continuous workplace learning. According to Stan Davis and Jim Botkin in their fascinating book *The Monster Under the Bed,* "Lifelong learning is the norm that is augmenting and in some cases displacing school-age education" (page 16). Consequently, "the schoolhouse of the future may be neither school nor house" (page 23). We must prepare our children for the learning workplace they will encounter. The foundation for growth and sustainability in this new learning environment is the continuous generation and exchange of knowledge, a process made possible by our inherent desire and capacity for new learning.

The old "educational efficiency" contract for the nineteenth-century school prescribed a "one size fits all" delivery system that accepted erroneous proxies like class time and course credits as indicators of genuine understanding. As a result, we created brain and learning antagonistic environments that actually inhibited integrative learning, distorted the learner's identity and his or her competence as a learner, and discouraged inventiveness, inquiry, and complex cognition. The new personalized learning covenant for the twenty-first century must continuously build individual capacity by stimulating natural learning, and it must be established and built upon a foundation of connection, coherence, mutually created meaning and purpose, dynamic relationships, and the evolutionary nature of the human experience itself.

What all this means is that we must transform the mechanistic paradigm of schooling into an integrated, holistic, and systemic vision of a sustainable learning community. How might we do this?

A PATTERN LANGUAGE

In a remarkable book titled *The Timeless Way of Building,* architect Christopher Alexander describes the essence of creating alive and dynamic space. According to Alexander, the structures we build (buildings or organizations), are created through a "system of patterns which function as a language" (page 178). He says, "All acts of building are governed by a pattern language .... and the patterns in the world are there entirely because they are created by the language that people use" (page 193). As we explore the principles and conditions necessary to create sustainable learning communities, we must recognize that our new understandings

about the universe, the natural world, and learning are enabling us to create a new pattern language for conceiving and describing learning environments.

We have moved from a linear language to a living language, from machine-based metaphors to ecology-based metaphors, and from rigid structures to mutable environments. Because, as Alexander asserts, "patterns are not things, but are complex and potent fields" (page 223), we must acknowledge that the natural world itself is trying to draw us closer to a new way of seeing and being in the world, and this has profound implications for the creation of learning communities. When we acknowledge that the brain is a complex, self-adjusting, living system and not a computer, when we understand that learning is a goal-directed and internally-mediated process of constructing meaning and not an information accumulation process, and when we recognize that human systems are dynamic and organic and not linear and predictive, we are compelled to use this new understanding to create new language, new patterns, and new environments that support and celebrate the nature of learning itself.

The reason our society must create a new language for learning communities that transcends school and classroom walls is that the dominance, attraction, and power of the current machine-based language of schooling is not capable of generating the organic patterns of the global learning community we now require. The very nature of the language, the potency of its field, and the meaning it constructs preempt its capacity to generate living patterns; only a living language can create living patterns and only living patterns can create living environments. We have excelled in the language of schooling. We must now become fluent in the language of learning and life.

If our language is prescriptive, our schools cannot be generative. If our language is static, our schools can not be dynamic. If our language is linear and algorithmic, our schools cannot be playful and creative. If our language is controlled, our schools cannot be mutable. A school cannot come alive and cannot become a sustainable learning community without a living language that creates living patterns of interaction and relationships; the language of nature and the new learning technologies provide such a lexicon. The creation of ecological learning communities is, therefore, extricably connected to the language of learning itself.

We need to create learning and teaching communities that enable learners to direct their own learning toward greater rigor, coherence, and complexity; to increase their intellectual, social, and emotional engagement with others; and to foster collaborative and dynamic approaches to learning that enable them to develop thoughtful and integrative ways of knowing. We must create a learning culture that provides a forum for risk, novelty, experimentation, and challenge and that redirects and personalizes learning. We must create learning communities for learners of all ages that can give power, time, and voice to their inquiry and their creativity.

Such a community is governed by the principles of learning, not schooling and is:

- Personalized, flexible, and coherent (learning is connected to real-life issues
- Internally and externally networked and not bounded by physical, geographic, or temporal space
- Invitational, with students engaged in meaningful research and serious inquiry
- Accountable to the learner to provide adaptive instructional environments
- Rich in information and learning experiences for all learners
- Open to emergent and generative knowledge
- Self-organized around core principles, beliefs, and a shared and mutually created purpose
- Intergenerational in the configuration of learning experience

- Flexible, diverse, and innovative
- Interconnected and collaborative, fostering interorganizational linkages
- Engaged in authentic dialogue with members of the internal and external community
- Focused on inquiry, complex cognition, problem finding, and problem resolution
- Committed to increasing what David Perkins, in *Outsmarting IQ,* calls the "learnable intelligences" of every individual
- Comfortable with ambiguity and paradox
- Playful
- Trusting
- Responsible
- Loveable

If we are truly,going to create learning communities for the twenty-first century, we must view our schools as dynamic, adaptive, self-organizing systems, not only capable but inherently designed to renew themselves and to grow and change.

LEADERS' NEW WORK

Although my focus has been on the creation of sustainable learning communities to replace the linear and depersonalized delivery system of schools, the sustainability of *all* human systems lies in their evolution to learning and teaching communities. It is for this reason that the current context of organizations must be reframed so that self-organizing complex adaptive systems can emerge. Leaders, therefore, will need to understand their systems' natural desire for self-organization.

What creates self-organization in living systems? In *Leadership and the New Science,* Margaret Wheatley has made it clear that self-organization in natural systems will emerge from the webbed and dynamic interconnectedness of three domains: *identity, information,* and *relationships.* If we want to build the resiliency and adaptive capacity of everyone in the organization; if we want the organization to increase its collective intelligence, potential for relatedness, and shared sense of meaning; and if we want to ensure long-term sustainability, leaders must be engaged in new work - they must create the conditions whereby identity, information, and relationships are dynamically connected around the system's larger purpose. What are the conditions that leaders must create?

IDENTITY

Identity is the principle most fundamental to all self-organizing systems. It encompasses the organization's meaning, purpose and intentionality and provides the coherence around which system stability emerges. Identity facilitates order and transformation even in turbulent environments because it provides a constant frame of reference for organizational integrity and renewal. Organizations and people have the capacity for self-reference when organization's identity, purpose, and meaning are clear and when leaders create the following conditions:

- They bring the system together to think about itself and to make decisions for itself *as a system.*
- They involve the expertise and experience of everyone in the system in creating the organization's fundamental beliefs, values, and shared purpose (mission) and encourage people to organize around them.

- They clearly and continuously identify the patterns in the organization, what the organization is trying to accomplish, and how each individual is connected to its future.
- They promote an organizational consciousness and a sense of belongingness to a larger purpose.
- They make decisions at the local level based upon a strong sense of organizational self (identity).
- They promote individual and organizational freedom and efficacy.

INFORMATION

Information is both the medium of exchange for generative organizational learning and its source of power. Within self-organizing systems, information is not a thing; it is the dynamic center of organizational life that allows continual growth and defines what is essential for sustainability. Without the constant flow of informational energy to both excite and serve the system, the system will become closed and isolated. Leaders can create the following conditions to ensure its robustness:

- They create open and multiple pathways for communication.
- They infuse the organization with abundant information by explicitly bringing the environment's voice into the system.
- They move information everywhere in the system.
- They continuously generate and share new knowledge.
- They promote honest dialogue, feedback, and interaction.
- They keep rules simple for detecting, processing, and integrating information.
- They seek out information that is complex, ambiguous, and paradoxical and encourage people to publicly discuss and use it.
- They encourage frequent and rapid experimentation.

RELATIONSHIPS

Relationships represent the neural network of the organization; they establish the organization's capacity for participation, engagement, and interconnectedness. Unless we feel connected to the organization and its members, we cannot identify with this purpose or generate and use its information for growth. Within this context, leaders must create the following conditions:

- They create networks and webs of dialogue, interaction, and generative communication.
- They establish open access to everyone in the system.
- They promote diversity of all kinds.
- They seek opportunities to engage as many people as possible in dialogue to reinforce their interdependence, connectedness, and sense of shared intention about the purpose and meaning of their work.
- They distribute power throughout the system
- They encourage people to act simultaneously and to coordinate their actions with each other.

- They establish strategic internal and external alliances and partnerships.
- They cultivate mutual interdependence.
- They build capacity for reflective, collective inquiry and collaborative accountability.

- They make the organizational boundaries permeable and flexible.
- They cultivate organizational coherence while building capacity to adjust to discontinuous change.
- They avoid neatness, tolerate messiness, and enable relationships to be redundant and overlapping.

Our attention to the connectedness of the physical world and to what Kevin Kelly, in *Out of Control),*calls the "bio-logic" of the natural world is revealing new insights into the nature of learning organizations and leadership. These new insights negate the mechanistic command-and-control principles of the past, dispel the concept of the single positional leader as the source of organizational identity, nurture the individual learner, and affirm the covenantal nature of organizational life.

Through the paradigm of the new sciences, we are coming to understand that the essence of leadership is to create the conditions that enable the intentional integration of the three domains of self-organizing systems found in the natural world: identity, information,and relationship. It is this integration that will enable system synergy to emerge. As a result, we need courageous leaders who can think and act in integrative, systemic, and soulful ways and who are not afraid to create transformational communities that learn their way into the future by inviting, engaging, and developing the fullness of human capacities.