

Does Education and Training Get in the Way of Learning?

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What is real learning?

How do we intentionally and purposely create conditions to make it more likely to occur?

Do our current educational and training structures support or inhibit real learning?

My premise is simple and straightforward: the schools we have today must be transformed because they simply are not capable of developing the kind of learner required for the redefined and restructured work place and environment of the next century.

Generative learning and the creation of knowledge are the core competencies underlying the future health and sustainability of all institutions and social systems; the quality of our future is inextricably connected to our capacity to learn; this capacity and the creativity and imagination it evokes, will be the new source and measure of wealth in the knowledge era.

Consequently, I am going to focus on how education, schools, teachers, students and communities must change in order to thrive in the knowledge era.

Within this framework, I will talk about:

- The current crisis in learning and schooling and how exceptional learning environments are created.
- The power of holding a certain worldview and how it influences the context of our work and behavior.
- New definitions of success in the knowledge era.

All around us we see evidence that we are in the midst of cultural transformation – a transformation fuelled by the emergence of a profoundly different view of how the world works and the recognition that it is human interdependence not independence that will be the foundation of a new global economy and ultimately a new global civilization.

This will require new social, economic, organizational, educational, and learning structures because 19th century schools cannot create 21st century learners. A new paradigm of teaching, learning and schooling must be created.

Revolutionary new insights about the natural world and the human brain are now enabling us to transform the current structures and processes of

schooling and develop learning communities that truly empower the learner and engage the fullness of her capacities.

Why is transformation necessary? I believe unintentionally we have created schools where many children and adults have become intellectually, creatively and emotionally anorexic.

Although the deprivation was clearly unintentional, the structures we designed within our schools were not. They were based upon what we knew about the way the world organizes itself and what we knew about organizations, schooling, learning and the brain and how one efficiently structures educational environments. However, our knowledge about the universe, about how human systems develop and about learning has grown so dramatically, that we now have an obligation to use what we now know to transform public schooling.

Clearly, it is intellectual and creative capital that will drive the new economy. This is the context and challenge of 21st century learning; we must prepare our children for the learning workplace and the learning society they will encounter.

How might we do this? For well over a decade, educators in the United States have been barraged with reports to support the contention that there is a crisis in public education. It is my belief, however, that the crisis is really about learning and the structures we have designed to develop it. The reason we are reframing the problem now is because new knowledge generated from discoveries in fields as diverse as quantum physics, chaos mathematics, evolutionary biology, systems theory and the neuro and cognitive sciences, are causing us to undergo two fundamental shifts in thinking:

- The shift in worldview from a machine-based clockwork conception of the universe to a living organic system perspective.
- The shift from understanding the brain as a computer to be programmed and learning as a process of information accumulation, to understanding the brain as a living self-adjusting neural network and learning as a natural, active and messy process of pattern formulation and constructed meaning.

Why are these paradigm shifts in thinking so important to education? Because inherent in these old mental models are three mechanistic metaphors that have framed our current views of schooling and learning: universe as clock, brain as computer and learning as *tabula rasa* (blank slates).

These metaphors and the deeply embedded assumptions and beliefs that ground them conditioned us to create the schools we now have. Yet insights from discoveries in the new sciences and learning theory have fundamentally altered these metaphors; in their place are organic biological metaphors that

place current schooling structures in dynamic opposition to and on a collision course with our new knowledge. This has put us in an inescapable position – knowing what we now know about human systems, learning and the brain itself, we simply can no longer do what we now do. We must reinvent the structures of schooling as we know them because old paradigm structures cannot enable or sustain transformation.

For three centuries the scientific worldview was an image of a static, deterministic, predictable, linear and clockwork universe. This mechanistic worldview deeply influenced almost every dimension of our personal, cultural, and organizational lives including our schools. Consequently we became preoccupied with things we could observe and we efficiently managed our schools and our students' learning by reducing them to discrete and measurable parts.

We created divisions, departments and rigidly closed systems. We focused on predictive cause and effect models of human behavior and learning. We designed formal hierarchies; we separated knowledge into disciplines; we created measurement systems that honored memory and not understanding, and we derided emotion as an interference to intellectual development.

Deriving our insight from a clockwork, mechanistic worldview, we behaved as if we believed that by controlling the parts we would understand the whole and that analysis would inevitably lead to synthesis.

In alignment with this clockwork and mechanistic view of how the world works, we internalized a paradigm of learning that is visible and palpable in almost every school in the world, especially high school. This predictive and closed system worldview enabled us to accept an algorithmic view of learning that embraced 12 erroneous assumptions. They are:

1. Learning is passive and incremental, not dynamic and developmental.
2. Learning is acquired information, not constructed meaning and pattern formulation.
3. Potential and capability are finite and bounded, not capable of being enhanced.
4. Intelligence is a fixed capacity and is not learnable.
5. Learning is defined by the calendar and not demonstrations and performances of understanding.
6. Content coverage and reproduction are more important than genuine understanding.
7. Rote memory is better than spatial memory.
8. Prior knowledge is unimportant to future learning.
9. Context segmentation is more highly valued than concept integration.
10. Reliable evaluation can only be objective and external, not qualitative and self-correcting and not conducted within settings of the real world.

11. Competition and external rewards are more powerful motivators than collaboration.
12. The primary conditions of thoughtfulness that Rex Brown describes which include mystery, uncertainty, disagreement, important questions and ambiguities are thought to be soft and lacking in rigor.

What all these assumptions point to is the view of a powerful teacher and a powerless learner and a 'one size fits all' system that stifles our natural desire to learn. It is the perfect prescription for training – the efficient and prescribed delivery or dispensing of information and skills but not for learning.

If we want to create powerful self-directed, collaborative and adaptive inquiries, we must ground our educational transformation and our leadership in the science of our times and we must create learning communities that encourage the purposeful and soulful engagement of children and adults in their work.

I said I believe that the crisis in learning is really grounded in two shifts of thinking. A shift in the machine-based clockwork concept of the universe to the complex living system perspective (just described) and the shift in our understanding about the brain and human learning. The last decade has produced incredible new discoveries about human learning and how we can best design environments that accelerate our natural learning processes.

The educational contract for the 19th century school was based on an efficiency mindset that prescribed our current constructs and understanding of teaching, learning and schooling and encouraged us to create a system that accepted false proxies like seat time and coverage as legitimate indicators of genuine understanding. As a result, we created brain and learning antagonistic environments that actually inhibited integrated thought, distorted the learner's identity and competence as a learner and discouraged skepticism, inventiveness, inquiry, and complex cognition – the very skills and predispositions needed for the knowledge era.

What we now need is a far more personalized, rigorous, flexible, accountable and coherent system of learning for the 21st century and this means we must replace the mechanistic paradigms and structures of schooling as we currently know them with a vision of a learning community that stimulates our inexhaustible capacity to learn; and what we are discovering about the brain and human learning dramatically informs how we might go about doing this.

When we understand that the brain is a complex pattern-seeking, self-adjusting, living system that grown I rich and dynamic environments and literally atrophies in deprived environments and is not a computer; when we understand that learning is a goal-directed and internally mediated process of constructing one's own meaning and is not only information accumulation; and when we

recognize that human systems are dynamic, organic and sense-making and are not linear and predictable, we have little choice but to use this knowledge to create learning environments that support and celebrate the nature of learning and life itself.

Although an increasing number of high school students graduate with presumed disciplinary mastery, there is a growing evidence that suggests that they also graduate with thinking characterized by stereotypes, misconceptions, unexamined assumptions and rigidly held algorithms that do not enable them to achieve genuine understanding.

Clearly, if schools are to be relevant, they must develop the conditions that enable empowered learners to thrive. We must move away from schooling to learning, we must move away from isolated classrooms and unconnected schools to the creation of sustainable learning communities. We must create environments that foster the use and transference of multiple symbol systems. We must encourage students to immerse themselves in authentic inquiry over extended periods of time; to have input into the content and design of their own learning, to connect and integrate concepts, to participate in the important work of the community and to become ethical leaders of their community's and their world's resources.

If we don't I fear we will continue to develop learning disabled youngsters who do not have the tools to understand the complexities and interconnections among different forms of knowledge and ways of knowing, who are afraid to risk and experiment, who seek simple and narrow solutions to complex problems and who have not developed the intellectual fluency and repertoire of skills to become lifelong learners.

We are clearly at a critical juncture in history with respect to our willingness to fundamentally reinvent public education. Past efforts that are focused on reform or restructuring have only made the current paradigm more efficient. New realities now call for a new voice and new commitments.

So we return to where we began. Do present educational and training structures get in the way of real learning? Regrettably, the answer is yes. School can no longer be the way we remember it. Our learning, our humanity and ultimately our sustainability depend upon it.