



THE SYSTEMS THINKER®

BUILDING SHARED UNDERSTANDING

VOLUME 12

NUMBER 7

SEPTEMBER

2001

LEARNING AS A BIOLOGICAL PROCESS

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Imagine yourself walking from your car to the office. On the small patch of lawn adjacent to the parking lot, you see 20 employees arranged in pairs. One member of each pair is leading the other, who is blindfolded, by the hand. Among them you recognize Simon and Mary from marketing, who seem to be tugging at the low branches of a Norway spruce. As the CFO of a major technology firm that is hip-deep in red ink for the fourth consecutive quarter, you reach into your pocket for an antacid and make a note to talk to the director of training and development at his earliest convenience. Undoubtedly, that experiential trainer is under contract—again.

This kind of “trust walk” is one example of what we might call *experiential learning*, but other examples abound. Facilitators use energizers, brief activities to get participants’ blood and creative juices flowing at the outset of meetings. Managers practice techniques derived from Aikido to better understand physically and metaphorically their patterns of interaction with others. Workshop participants walk ancient labyrinths as a meditative way of seeking solutions to vexing problems. Marketing and distribution specialists play games designed to help them understand the consequences of various decision-making strategies. Long-range planners use powerful software programs to play out different scenarios in cyber-space before they try them in the real world. And, leadership teams practice work-

ing with risk and fear by rappelling from rocky cliffs. All these experiences were designed to capitalize on the human brain’s remarkable capacity to learn in tandem with the body.

Experiential learning engages the entire physiology, by design.

What is experiential learning? With such a wide variety of activities that fall under a common heading, the definition can be elusive. After years of talking about the difference between process and content and relating elaborate tales about the power of learning by doing, I have come to rely on this simple and straightforward response: *Experiential learning engages the entire physiology, by design.*

The significant elements of this definition lie in the qualifier, *entire*, and in the phrase, *by design*. In other words, experiential learning involves questions of degree and intent. So, it follows that instructors who use an experiential approach should intentionally engage as much of the physiology as possible in the learning process. Indeed, some exciting new discoveries about the mind/body connection suggest that we should attempt to infuse *all* learning with experience.

A Sedentary Lifestyle

In the future, we will come to rely more and more upon experiential

learning because of the double-edged sword of technological advances. Technology has eliminated large portions of the physical work that daily living used to require, such as chopping wood and carrying water. The upside to this change is that we now have more time to pursue other kinds of work and leisure. The downside is that it has also lopped off a fair amount of the activity that grounds us in the natural world and, in the long run, keeps us healthy.

We are an active species, just a few twists of DNA away from the rest of the mammals. And unless the family dogs have become addicted to reruns of Lassie, you will not find any other animals that sit stone-faced in front of CRTs. Nor will you find them staring at each other all day

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across tables made of plastic laminate. Rather, they spend their waking hours playing, stretching, exploring, and learning. They engage the world continuously with their entire beings. We, on the other hand, have conditioned ourselves to suppress the urge to move around and experience things, instead confining our existence to small boxes surrounded by profoundly uninteresting scenery and sensation-deadening appliances.

The information age has converted us into a sedentary culture that has forgotten the powerful synergy of mind and body working together. We have relegated physical activity to the role of stress- and health-management techniques that serve the sole function of enabling us to remain productive workers and consumers. As a culture, we have not yet found the appropriate blending of action and contemplation that will lead to the next curve of our evolution. This leap to the next curve will require a robust society whose individuals have reestablished the connection between mind and body in their working lives.

If we are to pay attention to an entire system, be it organizational, national, or global, we must begin with the system that lies within each of us. This step will require a rich infusion of experience to recapture the capacities of our natural learning systems. Let's look at some of the scientific underpinnings for experiential learning and think about ways we can increase the amount of day-to-day *experience* in our organizational lives.

The Corporal Self in Cognition

A Sea of Hormones. Recent research on consciousness, most notably by Antonio Damasio, suggests that our attention and arousal systems emerge from complex interactions between the central nervous system and chemical activators that surge continually throughout the body. Even the title of his book on this topic, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (Harcourt Brace, 1999), hints at a revolutionary perspective on the role of the corporal self in cognition. Sure, we still

need the cognitive and language areas of the brain to recall facts and manipulate variables as we solve problems. But the emotions are essential players in the attention system and, by direct consequence, in the learning system. Without emotions, we would not engage ourselves in, or for that matter even recognize, the problems at hand.

Here is an example: If you narrowly miss striking a child on a bicycle who has veered in front of your car, for 20 minutes after the event, your heart pounds, your muscles shake, and your anxiety levels remain high. You are so distracted, you might miss your turn into the office's parking lot. This disturbance to your equilibrium results from your adrenal gland's releasing a tiny amount of epinephrine into your system. This hormone produces a state of mind and a level of physical readiness that enable you to take evasive action, but it leaves you with a bit of a hangover.

Mercifully, these attention-getting chemical alarms do not activate often. The real news is that powerful but very subtle chemical states influence virtually all of our cognitive functioning! Below the level of our recognition, human consciousness floats on an ever-changing sea of hormones and peptides. Here is a case in point: Low-level stress, the kind that is our near-constant companion in Western civilization, produces cortisol, a hormone that stays with us for hours. Cortisol interferes with learning and memory, ultimately causing the axons and dendrites in a part of the brain associated with long-term memory to atrophy and, in extreme cases, to die. Stress breaks down the neural networks that keep us in touch with ourselves. As we lose touch with ourselves, we lose touch with those around us—something that should be of great concern to managers.

Try not to let this information drag you down (remember, all that cortisol is not good for you). Better to ask how we can create working environ-

ments that *support* rather than *inhibit* learning. Our internal chemical environment determines not only what we learn, but also how well we learn it. Thus, our first task should be to attend to the physical/emotional status of learners. By acknowledging the primacy of biology, good experiential design works toward this end.



Mirror Neurons. On another research front, scientists have opened up an entirely new field of investigation that may have extensive ramifications for learning and teaching. Cutting-edge imaging technology affords researchers the ability to study brains at work. It should come as no surprise that certain areas of the brain become active when we make different motions. What is very surprising is that Giacomo Rizzolatti and his partners at the University of Parma have discovered a collection of neurons in higher primates that light up when an action is merely *observed*. Shortly after this announcement in the late 1990s, another Italian team confirmed the existence of a similar structure in humans.

Dubbed *mirror neurons*, these cells fire when we watch someone else perform an action, say picking up an apple. For example, if a dozen people are in a room with a single apple, only one person can pick up and taste the fruit, but 12 brains will mimic the action and activate salivary glands to begin digestion. Mirror neurons could account for a whole host of behaviors related to the power of suggestion, including the contagious nature of yawns, and are most likely linked to things such as the learning of tasks, intuition, empathy, and language acquisition.

In humans, mirror neurons are associated with the portion of the brain most directly connected to speech production. Rizzolatti and others speculate that the physical mirroring capacity in this area allows sophisticated human communication to develop and evolve. In other words, one's abilities to perform an action and then to talk about that action may develop in tandem. This

mutual emergence of experience and language holds great importance for us in that it suggests *we are biologically programmed to employ thought and action simultaneously*.

The speculation that talking and doing are inextricably entwined in our brains has mind-boggling implications for educators and facilitators. If true, then role-playing, drama, energizers, and other experiential activities should take a central role, equal with lectures and written material, in any learning endeavor. An ancient proverb reminds us that a picture is worth 10,000 words. By extension, might an experience be worth 10,000 pictures?

Furthermore, imaging technologies are showing researchers that seemingly unrelated functions of the mind interact with and influence one another. In other words, an action can influence a mood, and a change in mood can affect your perspective on an issue. Laughter may truly be the best medicine. Of course, the subtle interplay of various portions of the body and mind is much more complex than we may ever understand. But the current research suggests that if we are serious about tapping all our learning capacities, we will seek physiologically engaged learning. In short, get out of your seat and act!

The Learning Continuum

At one end of the learning continuum, the subject is passive; the emotions lie dormant; few senses are engaged; and the ideas are abstract. At the other end, the learner is physically active; is emotionally involved; is sensorially alive; and is grappling with tangible things. Any learning event may be placed along this continuum. I believe that our current understanding of learning suggests that, to the extent possible, we should be striving toward the experiential end of the spectrum.

When I mention the learning environment in an organization, I'm referring to much more than typical training settings. I include all those events where two or more come together for collaborative work. In any organization really trying to be a learning organization, every daily encounter should create the condi-

tions in which learning best occurs. These conditions include a high challenge/low threat environment, a minimum of distractions, sufficient time for quiet reflection, and physical activity.

As we begin to appreciate the complexity of the learning process, the challenge of designing an instructional experience that engages the entire physiology can feel overwhelming. How can we attend to the thousands of factors that can be manipulated to influence a person's learning? How can we incorporate some of the wonderful work that has been done involving learning styles and multiple intelligences by Howard Gardner, Daniel Goleman, Mel Levine, Dawna Markova, and others?

Fortunately, the task need not be daunting. One possible path through the complexity is a simple approach that stems from the early work of Geoffrey and Renate Caine, whose classic *Making Connections: Teaching and the Human Brain* (Addison-Wesley, 1994) has helped many educators come to a better understanding of how humans learn (see the reinforcing loops of "The Experiential Learning Cycle"). As a place to begin, this framework ensures that three essential ingredients for effective learning are added to the curriculum: paying attention to the learner's biology, providing an engaging experience, and assisting the learner to make meaning of the experience.

Relaxed Alertness. The circle begins with *relaxed alertness*. Creating a warm and welcoming atmosphere is important and not as simple as merely providing fresh coffee and a box of Krispy Kreme donuts. In fact, every sensory stimulus in the environment, planned or not,

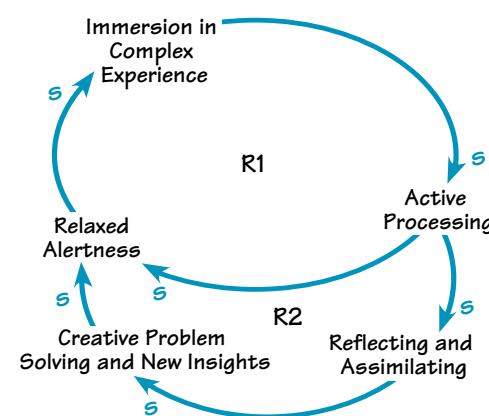
will either contribute to or detract from your purpose. Traffic noise, cooking smells, and other peripheral distractions make a difference.

At a more sophisticated level, the emotional and physical status of individuals and the group will affect outcomes. With the discovery of mirror neurons, we now have tangible evidence that one person's emotional state will affect the entire group. For this reason, facilitators should create a warm and supportive tone, in effect modeling a relaxed and attentive approach to the session. Beyond that, they can choose from a host of techniques aimed at relaxing the body and preparing the mind, including progressive relaxation, guided imagery, and balancing and centering techniques. None of this suggests that facilitators should lull participants to sleep. Rather, the intent is to remove threats and in so doing allow the participants to focus exclusively on the challenging work of learning something new.

With the exception of on-the-job coaching, all structured learning events are to a certain extent artificial. After all, they are not intended to be real-life/make-or-break events. Instead, I think of them as *learning laboratories* where participants may increase their skill, understanding, and

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THE EXPERIENTIAL LEARNING CYCLE



This model captures the flow of three essential components in the learning process. Beginning at *relaxed alertness* will always remind us to attend to the learner's biology first. (Adapted from *Education at the Edge of Possibility*, Caine and Caine (ASCD, 1997))

- Always have a goal in mind and an intent for everything you do.
- Help prepare the learners' physiology by acknowledging the stressors in their working lives and helping them make a transition to a state of relaxed alertness so they can give full attention to the task at hand.
- Respect the notion that learning is intensely personal and challenging and that only the learner should choose how, or even if, to participate.
- Acknowledge and honor the discomfort that some may feel when working in the physical realm.
- Provide enough richness and complexity so that those with varying learning styles, cultural differences, and intelligences will find an access point.
- Ensure access for those with differing physical abilities; offer alternative roles or modifications that allow for everyone's full participation.
- Provide adequate time for reflection so participants can make sense of the learning.
- Seek to find order in the learning but not to control it.
- Trust the process.

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capacity to better meet the challenges that lie ahead. Because the facilitator is creating the environment, it must be the facilitator's role to prepare learners to enter that environment.

This means creating safe physical and emotional spaces in which to begin an activity. It also means being clear about expectations for levels of participation and attending to the physical needs of the people in the room. Remember that during any learning session, participants will, for their own reasons, "check out" from time to time. Sitting in a classroom or meeting, they can do so unnoticed and then refocus on the session when ready. In any experiential work, "checking out" becomes obvious to the entire group. Making this need

for downtime acceptable from the outset is part of the facilitator's role. One way to do so is to acknowledge that everyone learns differently and that some people may choose to step out of an activity and merely observe for a while.

Immersion in Complex Experience.

The circle continues with *orchestrated immersion in complex experience*. One of the grand paradoxes of designing rich learning environments is that we are never sure what learning is going to emerge. The richer the design, the more room for creativity and insight. In fact, aside from the teaching of essential skills and the conveyance of rote information, any attempt to limit or control the outcome of an event will likely impede the progress of the learners. Why limit participants only to what we know or expect? Also, complex activities provide opportunities for all learners to find a point of access that suits their particular learning style or intelligence.

By now, you are wondering if I'm going to say anything about the actual design of an activity. Because of space limitations, the answer is "no." There are many excellent resources and books that, combined, provide thousands of activities aimed at specific learning outcomes (for examples, see "For Further Reading"). The key is to always let your intent drive your search for activities rather than the other way around.

Here are a few questions that may help guide you in increasing the "experience" factor in designing your own context-specific activities:

- What do I want the learners to learn?
- What do I want the learners to be able to do?
- How can I inspire the learners to become emotionally engaged in this activity?
- How can I involve their senses in the process?
- How can I engage them with another person?
- How can I encourage the learners to physically move, even if it is just to make a gesture?
- How can I increase the richness of the experience?

To the extent that you move learners

along the continuum toward more experience, you will increase the potential for learning.

Active Processing. The next step along the circular path is *active processing*. All learning that arises from direct experience is felt by the learner. It lies inside his or her body, perhaps locked in some complex chemical mix that he or she cannot express verbally. Meaning may be hidden from the learner and, by logical extension, from the rest of the group. Processing is the act of teasing into consciousness and giving language to those feelings in the body. This process may begin as a solitary task employing a bit of quiet reflection. Things will eventually begin to emerge, such as creative solutions to difficult problems, new ways of framing essential questions, or insights about patterns of interaction in a work group. Tapping into the body's innate intelligence takes time and patience but can lead to great rewards.

At some point, the facilitator may encourage participants to share their thoughts with the group, asking questions such as: What happened during the experience? What meaning does that hold for us? And, now what do we do with our new understanding? As observations come to the fore, the group can consider them and arrive at some shared learning. Often the understandings that emerge involve underlying assumptions about how the world works. (One advantage to participating in structured experiences that are not directly related to the bottom line is that they can allow learners to feel and speak very freely without fear of criticism or reprisal.)

Once the group has processed and assimilated the learning from an activity, it is ready to continue its journey through the cycle again (see "Guidelines for Experiential Learning Design").

Initial Resistance

When you introduce experiential activities to a group, you may encounter some initial resistance. Here are some arguments I have heard against experiential learning, as well as some responses:

"We don't have time for this; just tell

me what I need to know." Because we tend to separate physical activity from the intellectual work many of us do to make a living, assumptions about what it means to spend productive time on the job may lead some to question the appropriateness of physically and emotionally engaged learning. Despite all attempts to make it something else, learning is a biological process that takes time. The expedience of just telling people what they need to know often undermines their actually learning it.

"We don't want to get into how people feel about this." Deep learning profoundly touches people. When we employ experiential methods that require high levels of commitment and involvement, emotionally charged issues *will* emerge. Unless the group is a highly functioning and trustworthy team, or unless a skilled facilitator is present to help manage these difficult situations, the quality of interaction can deteriorate and the session may be counterproductive.

"None of that touchy-feely stuff for me." Experiential learning often involves sharing emotions and, in some cases, physical touch. Some participants, especially if they are old enough to remember the encounter groups of the late 1960s, will react with everything from reluctance to disdain. This guilt by association is unfortunate. Well-designed experiences in work settings should not involve coercion, expectations to participate outside one's level of comfort, or inappropriate physical touch. Facilitators must also remain aware of particular cultural differences regarding the appropriateness of different forms of touch. And although facilitators may sometimes borrow from the language of counseling, experiential learning is not about psychotherapy or probing into participants' personal lives.

"You can't prove to me this works any better than just having a meeting." That is probably true, at least in the short term. The process is messy. Outcomes are often unpredictable, and evaluation can be difficult. Of course, we can measure whether or not learners have acquired some new understanding or skill. But the deeper learnings that

involve changes in perception, behavior, or fundamental assumptions about how the world works are always in process. Perceptions shift, and meaning emerges over time. Traditional forms of assessment do not measure these things well, if at all.

"This stuff just doesn't apply in the real world." Some people will criticize an experiential approach because the game-playing nature of many activities and the emphasis on relaxed alertness do not seem to adequately mirror the difficult lives they lead in the work world. They wonder, justifiably, how a consciously constructed model or simulation relates to the chaotic nature of today's business environment.

In response to this concern, I refer to the most stressful environment I know: emergency medicine and rescue. In training people to work under severe stress, where life and death decisions are often necessary and complex techniques and equipment must be employed, the training is often fun, laid back, infused with humor, and highly experiential. Although their jobs are loaded with real-world stress, these professionals generally build skills and capacities in an arena that supports learning.

Nevertheless, the issue of context raises legitimate concerns. Research and practical experience suggest that learning is highly specific to the environment in which it was acquired, and we must be very careful about assuming that learning will somehow magically transfer from one setting to another. Processing, by raising issues to the conscious level, may help us to frame questions differently or experiment with options, but with no guarantees of crossover.

A Seamless Whole

I've said nothing new. Experiential learning predates the emergence of *Homo sapiens*. But we need only to look at the state of most public schools to recognize that the techniques and technologies supporting learning have reached a bit of a standstill in the past century.

Brain research, still in its infancy, promises to help us gain some insight into natural learning propensities we

have lost. Even now, it is providing good reason to do away with some of the dualistic thinking about human behavior that informs our culture. Paired opposites such as physical/mental, affective/cognitive, and hard skills/soft skills may drop from usage in the next generation.

Upon reflection, even the term experiential learning feels a bit dated. Science is now offering us a new way of framing experience that dramatically illuminates the relationship between head and heart. Perhaps as our understanding evolves, we will invent new language that honors the complex relationships that weave human experience into a seamless whole.

We have, with our technology, created a complex and challenging future—a future that will demand increasingly sophisticated learning to negotiate. But however advanced we become, we must remember that learning will always remain rooted firmly in our biology. ■

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For Further Reading

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