Developing Hybrid Minds: The Future Will Belong to the Nature-Smart

Richard Louv

For decades Waldorf education has pioneered ways to engage children in the natural world, not only for their intelligence and creativity, but for their spirits. For all of human history and prehistory, experience in the natural world has helped shape our species, including our brains. Yet, in recent decades, our society—and most schools of education—have looked everywhere but toward more natural environments for healthier brain development. As Waldorf education has shown, it's time to take a fresh look at our own backyards and schoolyards—at nature nearby and far.

We can look to earlier examples. Ralph Waldo Emerson, in a speech at Henry David Thoreau's funeral service, described his friend's many talents:

> He was a good swimmer, runner, skater, boatman, and would probably out-walk most countrymen in a day's journey. …The length of his walk uniformly made the length of his writing. If shut up in the house he did not write at all.[1]

These walks not only stimulated his creativity, but had practical, day-to-day application: Thoreau's outdoor experiences made him a sought-after land surveyor; he could not only outline boundaries with exactitude, but could also explain the ecological workings of an area in great detail. An amateur stream-watcher and river-gazer, he knew the secrets of local waters long before professional hydrologists took their measures.

This article is adapted from portions of Richard Louv's books, including *Vitamin N*, and expanded from a 2013 article in *RSF Quarterly*.

When NPR commentator John Hockenberry reported the research that revealed greater mental acuity after a nature walk, he pointed out that Albert Einstein and the mathematician and philosopher Kurt Gödel, "two of the most brilliant people who ever walked the face of the earth, used to famously, every single day, take walks in the woods on the Princeton campus."[2]

Well, we're not all Einsteins. But we've all experienced that *eureka* moment when the brain is relaxed and in a positive state. That can occur in a shower, indoors or outdoors, but in all of its complexity—with all of its loose parts and invisible connections—the natural world is by definition an incubator of creativity.

Becoming Nature-Smart

As I wrote in *Last Child in the Woods*, creative genius is not the accumulation of knowledge; it is the ability to see patterns in the universe, to detect hidden links between what is and what could be. In 1977, the late Edith Cobb, a noted proponent of nature-based education, contended that geniuses share one trait: transcendent experience in nature in their early years.[3] Environmental psychologist Louise Chawla of the University of Colorado offers a broader view. "Nature isn't only important to future geniuses," she says.[4] Her work explores "ecstatic places." She uses the word *ecstatic* carefully. Rather than applying the contemporary definition of "delight" or "rapture," she prefers the word's ancient Greek roots—*ek stasis*—meaning "outstanding" or "standing outside ourselves." These ecstatic moments are "radioactive jewels buried within us, emitting energy across the years of our lives," as Chawla puts it. Such moments are often experienced during formative years. But, because of the brain's plasticity and individual

sensitivities, they can happen throughout life. And they can happen for everyone, giving each of us the touch of genius.

Most studies of learning ability and creativity associated with the relationship between nature experiences and creativity involve children. In 2006, a Danish study found that outdoor kindergartens were better than indoor schools at stimulating children's creativity.[5] The researchers reported that 58% of children who were in close touch with nature often invented new games; just 16% of indoor kindergarten children did so. One explanation, for adults as well as children, is suggested by the "loose parts theory" in education, which holds that the more loose parts there are in an environment, the more creative the play. A computer game has plenty of loose parts, in the form of programming code, but the number and the interaction of those parts is limited by the mind of the human who created the game. In a tree, a woods, a field, a mountain, a ravine, a vacant log, the number of loose parts are unlimited. It's possible, then, that exposure to the loose but related parts of nature can encourage a greater sensitivity to patterns that underlie all experience, all matter, and all that matters.

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Other research focuses on adults. In 2012, the University of Kansas News Service reported: "Research conducted at the University of Kansas concludes that people from all walks of life show startling cognitive improvement—for instance, a 50% boost in creativity—after living for a few days steeped in nature."

"There's growing advantage over time to being in nature," said Ruth Ann Atchley, department chair and associate professor of cognitive/clinical psychology at the University of Kansas, when the results of the study were announced. "We think that it peaks after about three days of really getting away, turning off the cell phone, not hauling along the iPad and not looking for internet coverage. It's when you have an extended period of time surrounded by that softly fascinating environment that you start seeing all kinds of positive effects in how your mind works."[6]

Nature experiences stimulate learning and inspire creativity through ecstatic experience but also through the complexity of possibilities for play and learning, and through a kind of osmosis.

We need more research in this field, although we already know intuitively that nature stimulates the mind and soul and our love of place, and that there is no electronic substitute, particularly for infants and young children. Harvard professor E.O. Wilson's biophilia hypothesis holds that human beings are predisposed to an affiliation with the rest of nature. Researchers suggest exposure to the natural world restores the brain's ability to pay attention, that it not only restores us, but excites us, by stimulating all of the senses.

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As I've often mentioned, these ideas are not new to Waldorf teachers or other nature-based educators. But, because of recent research and a growing movement to connect children to nature, a wider public is coming to that conclusion—even as children's daily experience is becoming more virtual.

The Hybrid Mind

As of 2008, for the first time in history, more than half the world's population lives in towns and cities. The traditional ways that humans have experienced nature are vanishing along with biodiversity. At the same time, our culture's faith in technological immersion has no limits.

When my sons were growing up, they spent a lot of time outdoors, but they also played plenty of video games—more than I was comfortable with. Every now and then, Jason and Matthew would try to convince me that their generation was making an evolutionary leap; because they spent so much time texting, video-gaming, and so forth, they were wired differently. In response, I pointed out that my generation had said something similar about drugs, and that didn't work out so well. Chances are, neither will electronic addiction, which is why the nature balance is so necessary. What's different now is not the presence of technology, but the pace of the change—the rapidity of the introduction of new media and adoption of new electronic devices.

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That nearly total immersion may be clouding our senses and our ability to make sense of the world. Gary Small, a neuroscientist at the University of California, Los Angeles, suggests that the pace of technological change is creating what he calls a "brain gap" between the generations. "Perhaps not since early man first discovered how to use a tool has the human brain been affected so quickly and so dramatically," he writes in his book, *iBrain: Surviving the Technological Alteration of the Modern Mind*.

If Small is right, then my response to my sons—that evolution doesn't work that fast—may be overstated.

One view is that people who experience too much technology in the formative years will stunt the maturation of normal frontal lobe development, "ultimately freezing them in teen brain mode," as the Canadian magazine *Macleans* puts it. "Are we developing a generation with underdeveloped frontal lobes, unable to learn, remember, feel, control impulses?" Small writes. "Or will they develop new advanced skills that poise them for extraordinary experiences?"

Optimistic researchers suggest that all this multitasking and texting is creating the smartest generation ever, freed from the limitations of geography, weather, and distance—all those pesky inconveniences of the physical world. But Mark Bauerlein, an English professor at Emory University, in his book, *The Dumbest Generation*, reels out studies comparing this generation of students with prior generations, finding that "they don't know any more history or civics, economics or science, literature or current events," despite all that available information.

Here is a third possibility, the emergence of what I call the *hybrid mind*.

Recent studies of the human senses—including a cluster of spatial senses—back up that statement. Scientists who study human perception no longer assume we have only five senses: taste, touch, smell, sight, and hearing. The number now ranges from a conservative ten to as many as thirty human senses, including proprioception (awareness of our body's position in space), echolocation, and a more acute sense of smell. Each is a doorway into learning—to *knowing*.

The ultimate multitasking will be to live simultaneously in both the digital and physical world, using computers to maximize our powers to process intellectual data and natural environments to ignite all of our senses and accelerate our ability to learn and to feel. In this way, we could combine the "primitive" powers of our ancestors with the digital speed of our teenagers. Evolution may (or may not) be out of our hands, but as individuals we can accept and celebrate our technological skills at the same time that we seek the gifts of nature essential for the realization of our full intellectual and spiritual potential.

The best preparation for the 21st century, therefore, may be a combination of natural and virtual experience. An instructor who trains young people to become the pilots of cruise ships describes "two kinds of students, those who are good at video games, who are terrific

with the electronic steering; and those who grew up outside—they're far better at having a special sense of where the ship is. We tend to get one or the other kind." The first kind of student, he says, has a talent he prizes. "We have a lot of electronics on the ship." The second kind of student has another talent he needs. That student, using a wider range of senses, "actually knows where the ship is." The ideal pilot, he says, is the person who has a balance of high-tech and natural knowledge: "We need people who have both ways of knowing the world." In other words, a hybrid mind.

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The Uncommon Core: Creating a New Education Ecology

There are far more ways of knowing than technological or nature-based, but we do need more diversity in how and what we come to know. Finding an appropriate mix of technology and reality should be at or near the top of our list of our educational priorities at home; at primary, secondary, and higher education; and in our libraries and every other place of learning.

Currently, the force of economics is on the side of technology and standardized efficiency, even for the youngest children. Some preschool chains promote themselves by providing every child with an iPad. One over-the-top—or, actually, under-the-bottom—product is the "Digital iPotty with Activity Seat for iPad" for potty-training infants. It comes with "a built-in iPad stand," and can, according to the manufacturers, be used with "dozens of helpful potty training apps." The *Washington Monthly*'s special report, "The Next Big Test," projects that, thanks to artificial intelligence, the need for standardized testing will fade away, replaced by what proponents call "stealth assessment"—nonstop electronic monitoring of students, employing systems similar to those that grocery chain stores now use to track inventory. Most learning will occur through cutting-edge software "often in the form of video games"—Grand Test Auto, as the *Monthly*'s headline writer calls it. Or at least that's the goal.[7]

The more high-tech we become, the more nature we need.

Children and adults who work and learn in a dominating digital environment expend enormous energy *blocking out* many of the human senses—including ones we don't even know we have—in order to focus narrowly on the screen in front of the eyes. That's the very definition of being less alive. What teacher or parent wants his or her child or student to be less alive? Who among us wants to be less alive?

Achieving a state of balance in our schools should be a worthy goal for business and social entrepreneurs, for educators and physicians, architects and urban planners, for parents and policy-makers.

I am not anti-tech. I acknowledge the worth of digital technology in our schools and in my own family. Leaders in the tech industries could play a leading role. It's surprising how many of them own off the-grid cabin retreats. They know they need time to reboot, and that time in nature stimulates their creativity. For their own kids, some technology leaders have adopted these limits: thirty minutes to two hours of tablet or smartphone use a day; allow ten- to fourteen-year-olds to use computers on school nights, but only for homework; make a distinction between consuming and creating on these devices. A *New York Times* reporter once asked Apple's Steve Jobs, "So, your kids must love the iPad?" His answer: "They haven't used it. We limit how much technology our kids use at home." Yet, few tech leaders have spoken up for nature-based learning or balance in our schools. They have product to move.

Today, there is no economic force strong enough to counterbalance the economic interests of technology in education. Only a social movement—a new nature movement—can stand up for balance, and it has already arrived. We see it in the growing number of nature-centered preschools, in the proliferation of natural schoolyards, in the growing skepticism among parents about over-reliance on testing, on the growing body of scientific evidence that shows the importance of natural world experiences to healthy child development, physically, emotionally, spiritually, and cognitively. Now comes word of a new, six-year study of 905 public elementary schools in Massachusetts reporting higher scores on standardized tests in English and math in schools that incorporate more nature.[8] Similarly, preliminary results from a yet-to-be-published ten-year University of Illinois study of over 500 Chicago schools show similar findings, especially for students with the greatest educational needs. Based on that study, the researchers suggest that greening our schools may be one of the most cost-effective ways to raise student test scores. And we see the potential for a new educational ecology in the hunger among so many teachers for the healing power of nature in their own lives. Canadian researchers report that teachers who get their students—and themselves—outdoors can reignite their own energy and enthusiasm for teaching. Schoolteachers, like parents, receive the same benefits to physical and psychological health and cognitive functioning as children do, when they spend more time outside.[9]

Educators cannot achieve the new balance alone. That's one reason why the regional and state "No Child Left Inside" campaigns and the broader children and nature movement around the country are so important: By building community support, they create a wider constituency for place-based education, bringing social and political heft to the table.

In *The Nature Principle*, I make the case that the future will belong to the nature-smart—those individuals, employers, and political leaders who develop a deeper understanding of nature and balance the virtual with the real. It's time for a new educational ecology. One of its precepts should be this simple idea: The more high-tech we become, the more nature we need.

ENDNOTES

1 *The Selected Writings of Ralph Waldo Emerson*, ed. Brooks Atkinson (New York: The Modern Library, 1964), p.901.

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3 Edith Cobb, *The Ecology of Imagination in Childhood* (New York: Columbia University Press, 1977).

4 Louise Chawla, "Ecstatic Places," *Children's Environments Quarterly* 3, no. 4 (Winter 1986).

5 Bent Vigsø and Vita Nielson, "Children and Outdoors," CDE Western Press, 2006. Reported in "Nature Makes Children Creative," Copenhagen Post Online, October 18, 2006.

6 "Researchers Find Time in Wild Boosts Creativity, Insight and Problem Solving," University of Kansas, April 24, 2012, by *KU News Service*, http://archive.news.ku.edu/2012/april/23/outdoors.shtml

7 The Editors, "Special Report: The Next Big Test," *Washington Monthly*, May/June 2012, http://www.washingtonmonthly.com/magazine/mayjune_2012/special_report/special_report_the_next_big_te037216.php

8 C-D Wu, E. McNeely, J.G. Cedeño-Laurent, W-C Pan, G. Adamkiewicz, et al. (2014) "Linking Student Performance in Massachusetts Elementary Schools with the 'Greenness' of School Surroundings Using Remote Sensing," PLoS ONE 9(10): e108548.doi:10.1371/journal.pone.0108548

9 Anne C. Bell and Janet E. Dyment, "Grounds for Action: Promoting Physical Activity through School Ground Greening in Canada," Evergreen, 2006.

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