High Tech:// No Tech: A Call to Revive Nature Study Using Technology

By Gretchen Feiss

Taylor, Jared and Kyle were not interested in bird-watcher. Like most adolescent boys, they were more inclined to enjoy nature in fast-forward—from the seat of a dirt bike or via a precipitous leap into a swimming hole. So when Ron Joseph, conservation educator of the U.S. Fish and Wildlife Service, announced the birding walk on the morning of their class retreat, the boys quickly begged off, opting instead to scout the nearby pond for a nice spot to sit by or perhaps fall into.

In the lag time between planning and readiness, though, some of the boys found themselves irresistibly drawn towards the ruckus coming from the coalescing birding group. Lured over to the locus of the excitement, the boys found Ron aiming a set of iPod speakers into the trees, broadcasting a cacophony of bird noises. The wildlife expert announced that this was a recording of chickadees mobbing a screech owl. While the noise was interesting in itself, the effect was even more compelling. From every direction songbirds were converging to aid in the harassment of the perceived neighborhood bully. Chickadees and nuthatches. Thrushes, finches. The trees began to fill with squawkers and posers of all sorts. Excitedly identifying the song of a yellow-throated warbler, Ron initiated an enthusiastic hunt for the source. When at last the bird flitted into view, Ron said, "This guy probably just migrated up from Costa Rica to find a mate and stay on for the summer. We're lucky to see him! Note his black mask, like a little bandit. Now that is cool!"

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Their previous plans now forgotten, the adolescent boys eagerly tailed this Pied Piper naturalist for the next half-hour's stroll down the wooded Phippsburg drive. Hearing a specific birdsong, Ron would call up the species on his iPod, reeling in the singer for a territorial showdown with the recorded challenger. The use of mobbing, fighting and mating behaviors, the anticipatory act of hunting for a glimpse of each bird, the growing checklist of observed species, the anecdotes dramatizing the lives of these previously mundane creatures—an enchanting exhibition of nature at its most intriguing. After Ron called it a morning, the boys remembered their original hike and begged him to join them and continue the lesson. Taylor, Jared and Kyle were hooked on birds.

Ecological Literacy Is Important

Why does it matter whether kids like birds? It matters because we face a critical issue at this moment in Earth's history. Modern-day scientists widely agree that we stand at the brink of both a major mass extinction and catastrophic global climate change. While neither is an event unique to our geologic history, both are unprecedented in their anthropogenic origins and certainly spell bad news for us. Consider the subtext of all of our current dialogue concerning "sustainability": humanity stands little chance of survival if current environmental trends continue unchecked. In this context, the passions and interests of the next generation matter a great deal.

Today's science educators are thus charged with a monumental task: we must both recruit a new generation of scientific researchers and convey to all students the bleak consequences of unrestrained environmental degradation. Paradoxically we must also somehow avoid teaching despair. Humanity's only hope for shifting to practices that sustain both ourselves and our planet is to help the next generation appreciate what is at stake. In other words, the students of the 21st century must become ecologically literate by developing a deep understanding of, and connection with, the natural world (Orr, 2005).

Reaching the Disconnected Generation

This challenge is not small. These 21st century children seem to be the generation most disconnected from nature ever. As a demographic, they spend little time outdoors and a lot more time plugged in to technology. Rather than encouraging kids to go outside to explore natural phenomena, modern parents are increasingly likely to keep them safely inside, often occupied behind a screen. In *Last Child in the Woods*, Richard Louv (2008) outlines the stark consequences of a generation losing touch with nature and, ultimately, that part of themselves described as their "ecological identities" (Thomashow, 1996). If we don't

make a stronger effort to get kids outside, Louv argues, we risk not only our children's environmental ethic but their very health as well.

In addition to these worrying demographic trends, the goal of ecological literacy has also been undermined by shifting priorities in educational policy, which in recent years has steered us further away from outdoor learning. Promising movements to integrate field-based learning into science instruction seem to have been sidelined by 21st century initiatives. Standardization of learning outcomes and assessment practices epitomized by the No Child Left Behind Act has claimed many casualties. Programs such as GLOBE, Project WILD, Project Learning Tree, and local grassroots environmental education initiatives all too frequently get shelved in the push for students to achieve narrowly outlined content standards. (More information on these programs can be found after this article.) Supporters of the No Child Left Inside Initiative (2009), a grassroots coalition formed in response to the erosion of experiential learning caused by the similarly-named legislation, have taken action to reinsert the outdoors into the school day. The extensive list of member-organizations only hints at the widespread support among Americans to reclaim experiential learning time from the standardized testing frenzy.

The push for higher test scores has not been the only culprit interfering with field-based teaching practices. Technology has also drawn momentum away from field-based learning. Enthusiasm for the revolutionary potential of digital learning has led to initiatives that foster technological integration. Questioning what seems to be the universal rallying cry of the 21st century seems like tilting at windmills. This very year represents a milestone in Maine, as many high schools have joined the MLTI one-to-one laptop project. Like it or not, the digital revolution is here to stay. Thus, the challenge is finding ways to reconcile the push for technological integration with the need for field-based education. Put another way, the challenge is to reconcile man-made "high-tech" with nature-made "no-tech."

Technology Complements Field-Based Learning

Many of those reluctant to embrace technology in the classroom express concern about which learning experiences are being replaced by "the screen." If the tradeoff is between worksheet or textbook, learning and interactive digital learning, few dispute that technology is a superior choice. But there are still valid concerns about replacing real experiences with virtual ones. Given a choice between a virtual simulation of a natural phenomenon and direct experience, most would agree that the virtual choice is clearly inadequate. Of course, finite resources and instructional time limit our ability to create a direct field experience for every single phenomenon. Thus, the virtual experience, though less rich, trumps no experience at all.

However, the choice between teaching with high tech and no-tech need not be an either/or proposition. Every day, new technological tools emerge that genuinely enhance the learning value of field experience. In this regard, Taylor, Jared and Kyle's experience is instructive. Without that iPod, Ron didn't have much chance of reeling those squirrelly boys in to learn to appreciate birds. Playing with a GPS Starfinder clearly demonstrates the connection between interest and technology. You simply point the device at whatever bright celestial object catches your eye. Gone are the days of fiddling with red flashlights on confusing star charts, of trying to remember what you saw so you can look up its facts later at home. One press of a button offers up names and narratives that make stargazing infinitely more compelling. Such high tech tools, among the many now available, illustrate how we can embrace both high technology and no-technology at the same time. We can—and we must—get students out of the classroom. Let them enjoy the quiet of the woods, contemplate the intricate communities of a pond or tide pool. Let them also use the best tools available to enhance and better understand these experiences.

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This idea is neither new nor earth-shattering, and it reflects the attitudes of today's digital natives. For them, the very idea that digital technology is a separate entity from daily experience is pretty old-school. Today's students are no more impressed with the full integration of technology into their curriculum than my generation would have been by the use of ball-point pens. Technology is a fact of life.

The very enterprise of scientific endeavor owes its advancement to the timely and creative application of new technologies. Without great advancement in processing speed and climate modeling software, for example, we would not know the effects of carbon output on global climate change. That's why apprenticeships in scientific careers have always incorporated training in appropriate technologies into lab and field learning beginning in the first year of college. What is new is that K-12 science educators have increasing access to powerful technological tools and the range of those tools is expanding at a breathtaking pace. These tools are evolving so quickly that classroom teachers are often overwhelmed by the vast array of technological options available to enhance student learning.

Supporting Teachers' Development

The journey from our current practice to our potential raises many questions. How can teachers learn about what tools are available in timely ways? When will they have time to learn about how to best integrate them into curricula? And, most critical, will educational leaders encourage teachers to pursue curricula that teach students to connect with the no-tech, natural world by using high-tech tools?

At this crucial moment in our history, it is imperative that we tackle these questions. Today's educators need support to bridge the gap between high-tech and no-tech and put to rest the outdated concept that they are mutually exclusive. In this era of rapid change, both in our work as well as in our environment, we must focus on applying the newest and best of humanity's technological achievements to help our students reconnect with an appreciation for the ancient and primordial. The fate of the birds, the Earth, indeed humanity itself, rests on what they do.

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Selected Field Based Programs

Project Learning Tree and Project WILD were some of the earliest formal K-12 environmental education curricula: Project Learning Tree introduced in the mid-1970s and Project WILD debuting in the 1980s. Each emerged from the collaborative efforts of distinct groups of natural resource stakeholders and educators, so both programs are national in scope. Project Learning Tree emphasizes sustainable ecosystem management, while Project WILD explores the intrinsic value of ecosystems beyond human activity. Teachers trained in both programs graduate with modules of teaching activities that address a variety of topics cross-referenced with national subject standards. Many of the activities are designed to be delivered outdoors, and they typically implement experiential learning methods. Some of the lessons from these curricula are so successful and popular they have achieved iconic status among teachers of basic ecology principles. The predator/prey tag game, "Oh Deer!" is a classic example.

Initiated in 1994 by Vice President Al Gore, GLOBE involves students in the collection and interpretation of real scientific data in real time. Classrooms involved in the project go into their communities to measure various environmental health indicators, such as water quality or meteorological data. Students upload the data they collect to a global database which collects data from classrooms around the world. Later they can use the data to interpret trends and variations. GLOBE encourages students to make sense of environmental science phenomena through inquiry into authentic field-based research. In recent years the program has shifted its pedagogical focus from teacher-directed to student-initiated or directed research. A campaign starting in 2011 will emphasize global climate change science.

Throughout Maine, organizations abound with the aim to connect schools with local natural areas for field-based learning. A fine example of these homegrown environmental education initiatives is Topsham's Cathance River Educational Alliance (CREA). Formed cooperatively between a real estate developer, local conservationists, and educators, CREA has implemented teacher-training sessions and built a model low-impact field station. It is a wonderful resource—though one regrettably under used by area schools because teachers need time and administrative support to inject such excellent learning opportunities into a standards-driven, test-heavy curricula.

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We use cookies and other tracking technologies to improve your browsing experience on our site, show personalized content and targeted ads, analyze site traffic, and understand where our audiences come from. To learn more or opt-out, read our Cookie Policy. Please also read our Privacy Notice and Terms of Use, which became effective December 20, 2019.Â Scientists hooked up 32 dead pig brains to a machine to revive them. And it worked. By Brian Resnick@B_resnick.Â Then they hooked them up for six hours to a system called BrainEx, which pumped those brains full of oxygen, nutrients, and protective chemicals. At the end of the 10 hours, the scientists found that the tissue of the pig brains was largely intact, compared to controls. NATURE'S CALL TO WILD Science is proving what we've always known intuitively: nature does good things to the human brainâ€”it makes us healthier, happier, and smarter. Nature writer David Gessner explains why. In 1865 the great landscape architect Frederick Law Olmsted looked out over the Yosemite Valley and saw a place worth saving.Â Korea Forest Service scientists used to study timber yields; now they also distill essential oils from trees such as the hinoki cypress and study them for their ability to reduce stress hormones and asthma symptoms. In the new industrial city of Deajun, I pay a visit to the forest minister, Shin Won Sop, a social scientist who has studied the effects of forest therapy on alcoholics. Peruvian scientist Marino Morikawa, who "revived" polluted wetlands in 15 days using nanotechnology, now plans to try to clean up Lake Titicaca and the Huacachina lagoon, an oasis in the middle of the. Peruvian scientist who "revived" wetlands aims to clean up Lake Titicaca | Science & Technology | English edition | Agencia EFE.Â The idea of restoring the wetlands came from a call from Morikawa's father, who told the scientist that El Cascajo, where they used to go fishing when Marino was a child, "was in very bad condition," Morikawa told EFE. Marino Morikawa, who earned a degree in environmental science from Japan's Tsukuba University, visited the wetlands and found a dump for sewage ringed by an illegal landfill where migratory birds fed.