

# Classrooms Without Walls:

## *A Banana Plantation, the Random Fallen Tree, and a Turtle Nest*

By Jacqueline McLaughlin

After years of teaching in and out of the classroom, I've come to believe that experiential learning is, in fact, the quintessential pedagogical method.

AFTER CARRYING US THROUGH ENDLESS plantations along the eastern Caribbean slopes of Costa Rica, the bus stopped and we set up a classroom right there, in the Carmen, a Del Monte-owned banana plantation. Leah, one of my undergraduate biology majors, began to do her field presentation, "The Story Behind the Banana." Surrounded by banana bushes and conveyor belts, she began to sing ever so softly, as we stood motionless around her:

*They took all the trees, and put 'em in a tree museum  
And they charged the people a dollar and a half  
to see them*

*Don't it always seem to go  
That you don't know what you got till it's gone  
They paved paradise, and put up a parking lot*

*Hey farmer, farmer, put away your DDT  
I don't care about spots on my apples,  
LEAVE me the birds and the bees please*

*Don't it always seem to go  
That you don't know what you got till it's gone  
They paved paradise and put up a parking lot  
Hey now, they paved paradise to put up a parking lot*

Leah, who had just sung a portion of "Big Yellow Taxi" by Joni Mitchell, then gazed at us with sincerity and asked, "What do you think the verse *paved paradise* to put up a parking lot actually means?"

Several in the class raised their hands, and Leah called upon Jeanne.

"The lowland tropical rainforest has been clear-cut to satisfy our need for the 'perfect banana,'" said Jeanne. "We have banned DDT in our own country, but because of our own selfish need to consume a banana without scars or bruises; American-owned companies still spray this chemical, and others, over endless fields of banana in other nations."

"Absolutely," replied Leah, assuming the role of instructor. "And additionally, the banana plantation workers are unfairly exposed to these toxins. They are getting sick while rivers and the oceans are also being polluted."

From here, her presentation and classroom discussion grew in detail—supported by her pre-trip research and interviews she had conducted with Ticas (the local term for "Costa Rican") thus far during our journey.

Is this type of learning—that which takes place in a classroom without walls, where the teacher is

not on center stage—any better than more traditional methods?

Frankly, yes.

### Outside the Box

After years of teaching in and out of the classroom, I've come to believe that experiential learning is, in fact, the quintessential pedagogical method. For it not only promotes an understanding of biological concepts, but also an environmental ethic. I'll get to the ethic part in a minute, but first—a little background:

I am a trained cell and developmental biologist, and for a long time my teaching was fueled by a love of basic research. In my personal life, I expressed my love of the outdoors through my hobbies. But during the last several years, I have felt compelled to combine my love of teaching with that for the outdoors—and it's dramatically changed my teaching agenda.

Hard data tells us that time is running out. Many experts predict that as much as one-fifth of all species could become extinct within 30 years due to man's destruction of plant and animal habitats. At the same time, a growing number of biology educators believe a new method of teaching biodiversity offers real promise. In addition to traditional conservation biology, these teachers also strive to foster students' "intuitive sense about nature"—similar to bioethicist Edward O. Wilson's concept of "biophilia." As Rob Baldwin of the Audubon Expedition Institute explains, students exposed to this method "often get in touch with deep feelings and become motivated to do some kind of political action." [source: <http://trumpeter.athabascau.ca/content/v14/baldwin.html>]

Thanks to experiences I've had on field courses, I've decided to commit all of my efforts, in every course, to fostering an environmental advocacy among my students.

However, educators looking to build environmental ethics face a huge barrier: Most students are es-

tranged from the natural world. They lead a “buffered” existence within human-built environments (Leopold 2004) or techno-ecosystems (Naveh 1982). Their exposure to living organisms takes place predominantly in zoos and aquariums or (even more remotely) through gazing at color-coded diagrammatic pictures and figures in packaged textbooks. So to nurture students’ knowledge of and affection for the land, educators need to do more than merely transmit stale biological principles.

### Creating a Better Learning Environment

I’ve always felt that the walls of my classroom were too confining, and that teaching in the classic lecture-notes-memorize paradigm was ineffective. What was needed was a teaching method that went beyond colored chalk and transparencies and fill-in-the-blank and multiple-choice tests. So for a long time, I concentrated on creating visual animations, so-called “interactive” Web-based modules that helped explain complex concepts. The computer animations, which were designed to be manipulated by students independently, complemented their love of technology—a fascination no doubt shared by students in college classrooms across the nation. In addition, the format was well-suited for relaying complex issues and scenarios. For example, one module called for students to build a weather station in Brazil (by gathering real data and plotting a climograph); another required constructing a field station at Hubbard Brook (students used a lithotripter to study a watershed).

The modules are effective because, for most students, if they can’t see something directly, like the chromosomes moving during mitosis or electrons flowing along the inner membranes of the chloroplast during photosynthesis, they simply aren’t “getting” it. When these processes are brought to light via technology, students are encouraged to explore—they become engaged. And that engagement elicits the correct comprehension of key biological concepts, and it also corrects any misconceptions resulting from memorizing colored-coded diagrams (McLaughlin 2001).

What interactive modules don’t do is instill a land ethic. Only a wall-less classroom can do that.

### The ‘Experience’ Must Be Real

When traditional classroom boundaries are removed, students are faced with the biological reality of the jungle, open savannah, temperate deciduous forest, alpine tundra, and taiga—to name just a few settings. But I’m not talking about a free-for-all picnic here. The key when going “wall-less” is to incorporate multiple learning components. Stam Zervanos, professor of biology at the Penn State Berks-Lehigh Valley College, and I have co-developed parameters for field courses in biodiversity and conservation biology that employ experiential, interdisciplinary, and international teaching and learning components (Zervanos and McLaughlin 2003; [www.lv.psu.edu/jxm57/explore](http://www.lv.psu.edu/jxm57/explore)).

The parameters can be divided into three main parts: 1) Pre-trip Assignments—primarily innovative Web-based activities that



provide essential background knowledge, 2) the Field Work—which includes hands-on experience, journal keeping, conservation research, participation in discussion groups, and 3) Post-Trip Assignments—again, primarily Web-based activities that encourage the integration and application of key concepts learned.

Courses that incorporate these elements create opportunities for students to delve into biodiversity and conservation issues firsthand. For instance, while hiking with my students through the lush primary Monteverde Cloudforest in Costa Rica, we encountered a tree that had fallen along our path. This simple observation sparked discussion of a complex concept. The fallen tree served as tangible evidence of a “natural disturbance,” and had resulted in the creation of open space. This open space now allowed light into the under-story, which in turn was creating new niches for organisms to repopulate the area.

The natural disaster had effectively kept competition at a maximum and biodiversity high—particularly when compared to an adjacent old growth under-story. But the bigger lesson for the students was that nature, when left unscathed, was “wired” to oversee its own intricate population dynamic. They understood, too, that the “unnatural” disturbances of man—such as clear-cutting and slash and burn harvests—actually diminish an ecosystem’s ongoing adaptation and sustainability. As Wilson himself once explained, “When you cut a forest, an ancient forest in particular, you are not just removing a lot of big trees. You are drastically imperiling a vast array of species. The number of these species may go to tens of thousands.”

In another example, my students and I volunteered at the Caribbean Conservation Cooperation in Tortuguero, Costa Rica. Each night we patrolled the volcanic beaches along with researchers, searching for nesting Atlantic Green Sea turtles (*Chelonia mydas*). Our mission: to mark nests, count eggs, and identify or tag turtles, including taking note of any tumors and scars. Each evening we were filled with wonder, pondering the turtle’s ability to overcome any obstacle—even rip tides—in an effort to return to and lay her eggs on the exact beach where she herself had been born.

One morning, sadly, we discovered a nest that had been poached. Students then faced the cold reality of so many serious threats to the turtle’s existence—including local customs (the

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turtle eggs are seen in many ways, including as a food source, aphrodisiac, and as a component of a local rite-of-passage), end- less pollution along the shoreline, feral dogs that prey on nests, beach erosion that destabilizes them, and, most surprising, garbage buried under the sand by the local population. Through this experience, students learned a disturbing truth: the factors now threatening the turtle's survival are more powerful than even its awe-inspiring natural instinct to survive.

### In Action

The wall-less classroom model was assessed to determine how a field experience in Costa Rica contributed to student learning gains in conservation biology and environmental science through a combination of embedded assessment tools, surveys, and directed response assignments. Students were asked to keep field journals describing their learning each day. These journals were assessed using a rubric that examined the extent to which students demonstrated the ability to apply pre-trip learning in a field setting. The surveys asked students to rate the extent to which specific learning experiences in the field contributed to gains across specified biology knowledge domains. The directed response assignments required students to elaborate on field observations within a theoretical framework. Together these sources of data were used to triangulate the findings and demonstrated that students were able to apply and integrate knowledge gained in the pre-trip experience demonstrating deep learning of conservation biology and environmental science principles. Journal entries and open-ended responses in the survey provided evidence that students participating in the trip demonstrated attitudes consistent with persons who will become life-long advocates for conservation biology.

Given that, the next goal is to help translate the components of wall-less teaching to high school classrooms. To that end, I've established an international program called CHANCE (Connecting Humans and Nature in the Costa Rican Environment), in association with the Pennsylvania State University (PSU), Pennsylvania Department of Education, Minister of Education of the Republic of Costa Rica, Pennsylvania high school pre-service and in-service

teachers, researchers from the Caribbean Conservation Cooperation, Asociacion ANAI, the La Selva Biological Station managed by the Organization of Tropical Studies, as well as other conservation sites and established researchers around the world. CHANCE is designed to provide both in-service and pre-service Pennsylvania high school environmental science teachers with the background required to incorporate wall-less classroom components back at home—with their own back-yards serving as “the field.”

Early assessment data suggest that teachers participating in the experience perceive that student learning will increase as a result of implementing the wall-less model as part of their learning designs and that they find it difficult to imagine teaching conservation biology absent some field experience. That's definitely been the case for me—as I look forward to working with CHANCE educators and the PSU Royer Center for Learning and Academic Technologies to develop interactive Web-based “research” modules based on factual conservation biology fieldwork, all of which will be made available to anyone teaching high school biology or environmental science around the commonwealth—and ultimately the nation and Costa Rica. After that, we'll translate these modules into Spanish.

After that, who knows? Maybe one day soon, a student somewhere in the midst of a Costa Rican banana plantation will get her classmates' attention by singing “Big Yellow Taxi” in Spanish. **IE**

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and internationalization of education, and has been a spring board for a new generation of young leaders focused on global peace. **IE**

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### Endnotes

1. *Toward a Century of Cooperation: Internationalization of Higher Education*, International Association of Universities Policy 2000, [http://www.unesco.org/iau/tfi\\_statement.html](http://www.unesco.org/iau/tfi_statement.html).
2. For a list of SYLFF institutions, access: <http://www.tkfd.or.jp/eng/division/fellowship/sylff/institutions>.
3. “Editorial Note,” *The SYLFF Newsletter*, No.8, February 2004, p.16.
4. <http://www.tkfd.or.jp/eng/division/fellowship/sylff/announcements/pda.shtml>.
5. For a complete explanation of the different phases of SNP consult, <http://www.tkfd.or.jp/eng/division/fellowship/sylff/announcements/snp.shtml>.
6. For details of The Tokyo Foundation's programs and publications, access: <http://www.tkfd.or.jp/eng/division/fellowship>.