EDUCATION WEEK
Published Online: September 9, 2013
Published in Print: September 11, 2013, as **The Ecology of Learning**

Learning: A Holistic View

By Alan J. Friedman

Ten minutes before you began reading this sentence, what were you doing? Perhaps eating breakfast, driving to work, sending a tweet, using the copy machine or an exercise machine, calculating a tip, or reading a newspaper. Whatever it was, where did you learn how to do that? It might have been in school, but it might have been from your parents, the Internet, a friend, or just something you figured out how to do by yourself. And you might not even remember when or where you learned how to do it.

Not too long ago, it was reasonable to imagine that there was some sort of official time and place for learning everything: manners from your parents, reading and math from your school, use of a computer from a CD tutorial or an instruction book. Today, each of these associations is but one of a host of reasonable possibilities.

We often can't recall where we learned any specific bit of knowledge or skill. And maybe it was always like that. But it certainly was convenient to pretend we could ascribe responsibility for every act of learning to a specific agency. That way, we knew whom to blame if we came across someone who was rude, illiterate, or undertipped us.

The strategy of assigning responsibility for learning to specific agents or organizations has been a hallmark of our view of education. Johnny can't read? Blame the schools. Blame the teachers. Blame the curriculum. Jane is a bully? Blame her parents.

And how is that blame game going for us?

Half a century of school reforms—including data-driven policies, smaller high schools, charter schools, alternative credentialing, high-stakes testing, teacher evaluations, closure of failing schools, and battles against teacher tenure—have led to, at best, modest incremental progress for some students in some areas. The reforms have narrowed but failed to close the still-grotesque gaps between rich and poor, black and white, where we want to be and where we are. A double-digit percentage of our children score "below basic" on just about every subject on the National Assessment of Educational Progress, the most reliable measure we have.


—Daniel Hertzberg

A growing number of academics, policymakers, on-the-ground educators, and philanthropies—including the Noyce Foundation, on whose board I serve—have come to think that the picture of a compartmentalized system of learning is a big part of the problem. Studies commissioned **by the Noyce Foundation**, the **S.D. Bechtel Jr. Foundation**, the **Gordon and Betty Moore Foundation**, the **Wellcome Trust**, the **National Science Foundation**, and the **Institute for Museum and Library Services** are generating fresh looks at evidence that humans learn everywhere, during every waking moment. Children's brains make intellectual connections based on what they learn from their parents, peers, school, after-school programs, parks, zoos, television, books, and the Internet. But what also matters in this equation is what students *want* to learn.

Interest, passion, attitude, and identity count, but who or what is responsible for developing those traits for math, science, reading, and history? I believe that until we—students, teachers, parents, administrators, policymakers, and funders—begin treating learning as an interdependent ecology rather than as separate subject-by-subject agency responsibilities, we will continue to be frustrated with the pace and impact of education reform.

"I think educators and stakeholders should start right now to consider how they can take advantage of and facilitate 'learning across life' at every age"

Longitudinal and cross-sectional studies of learning ecologies, supported by foundations and government agencies, are a growing part of the education literature. Many of these studies are "agnostic as to place and setting," as George Bo-Linn, the chief program officer of the Gordon and Betty Moore Foundation, describes its multi-institution "Activated Young Science Learner" project.

Researchers John Falk, Lynn Dierking, and Nancy Staus' landmark **"Synergies" longitudinal study**, now underway in Portland, Ore. (with support from Noyce), is another example of the serious attention to the broader concept of an ecology of learning. The researchers are tracking a cohort of children from 5th to 8th grade, looking at their interest and engagement trajectories in science, technology, engineering, and math, as well the influences and interactions of how they find and use STEM learning resources in their lives, both in school and out of school. By helping all players within the community—formal and informal educators, as well as parents and children—better understand children's current interests and activities, the researchers are hoping to foster a whole-community approach to STEM education that ensures that learning happens seamlessly across children's lives.

I think educators and stakeholders should start right now to consider how they can take advantage of and facilitate "learning across life" at every age. Foundations and other funders can support all the demonstrated channels of learning (not just the schools) by helping parents become learning facilitators during family activities and by helping science centers and other informal learning institutions reach more diverse populations of kids and their parents. They can help after-school programs offer kid-attractive science, math, art, and history in coordination with, but also independent of, what schools are doing.

And all of us can strongly support the new standards (the common core and the Next Generation Science Standards) as they move away from demanding learning that's a mile wide and an inch deep toward a carefully limited but much deeper set of learning expectations. The science standards, for example, call for learning not just a list of facts, formulae, and particular skills, but also a set of "practices," including "engaging in argument from evidence," "developing and using models," and "obtaining, evaluating, and communicating information."

These science activities are seen more commonly in hobby clubs and online discourses than they are in traditional K-12 classrooms.Stakeholders, such as funders and local, state, and federal education policymakers, can call upon all parts of the learning ecology to accomplish the Next Generation vision of science literacy.

And we can admit that learning agencies alone are incapable of solving all our learning issues. As Uri Treisman, a professor of mathematics and the head of the Dana Center at the University of Texas at Austin, pleaded in his stirring appeal to the National Council of Teachers of Mathematics at its 2013 conference, we have overwhelming evidence that poverty and lack of opportunity to learn are critical education barriers. With these huge road blocks in place, we cannot succeed in creating a successful ecology of learning for all children. We must work on all of these challenges simultaneously, and we must start now.

Alan J. Friedman is a consultant for museum development and science communication. For 22 years, he was the director of the New York Hall of Science, a public science-technology center in New York City. He is a member of the board of the Noyce Foundation, which helps support Education Week*'s coverage of science education, both inside and outside of school.*

Vol. 33, Issue 03, Pages 32,36