

Helping students find their on ramp to science means letting them take wheel

Written by Dr. Danielle N. Lee
Monday, 10 June 2013 11:32

"Teaching high school students was the best thing ever."

This isn't a statement often exclaimed by scientists with PhDs. We're groomed to do research and teach college level courses to mature, engaged students. I was completely on track to do just that, until I signed up for a special teaching assistantship while in graduate school – the Graduate STEM Fellows in K 12 Education funded by the National Science Foundation ([NSF GK-12](#)

). Instead of teaching general biology labs to college freshmen and sophomores, I chose to co-teach general high school biology and environment sciences. I served a classroom resource scientist at an urban high school in St. Louis.

I came to class full of excitement and optimism. I was going to help a new generation of students find their on ramp to science. I was greeted by disengaged students. Some had mentally checked out of education. I encountered students who professed often and loudly how much they detested science and how they were not suited for it, for no other reason than they were Black or poor. It broke my heart to hear people so young resign themselves to failure. My students were the real-life examples of the disparities in science education we hear about in the news. African-American children, Latino children and those from low-income families score lower in standardized tests on science and math than white counterparts, according to the National Center for Education Statistics.

As the weeks passed, I struggled to connect with them, make the lessons interesting and easy to understand. I worried that they were falling behind. However, I soon realized I was completely off base. They weren't remedial learners; they just weren't interested in the lessons. The very students who would often put their heads down or disrupt class, were often the ones who couldn't wait to tell me what they watched on Discovery Channel the night before. They could repeat every fact about an animal or machine being built from watching a program one time; and other students would chime in – all with excitement in their eyes. It suddenly occurred to me, they did not hate science; they hated science class. After some serious reflection on what we were doing – lectures, worksheets, bookwork and hardly any hands-on experimentation – I could hardly blame them. That's not what I do as a scientist. I study questions that are interesting to me. I get a chance to ask questions, get dirty, travel, and make mistakes without being a labeled failure for an experiment that didn't turn out as expected.

Suddenly, my frustration with them subsided. I no longer blamed them for checking out. We were boring them to pieces not giving them the opportunity to explore questions they were personally interested in pursuing. The classroom lessons were not representative of how awesome science really could be. They knew it, too. The science on television was fun, engaging, and interesting. What we were doing in the classroom was a far cry from that. Science is observation, asking questions, trial and error, revising, critiquing, reading, writing, trying again, presenting, summarizing, measuring, and much more. I sat down with my teaching mentor and decided to shift focus. Offering students a risk-free chance to do fun, hands-on science in an after school setting became my focus. Students wanted a chance to do something, go on field trips and experience science – not simply be told what someone else discovered long ago.

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From that moment on, I have been an advocate for informal science learning opportunities. These types of learning opportunities are especially important for students who may not be on the college track. They deserve a chance to demonstrate their genius – because they are brilliant, too. My students were shining examples of how patience and opportunity without judgment can provide the perfect setting for "least-likely" students to discover a love of science, too.

Dr. Danielle N. Lee is a post-doctoral researcher at Oklahoma State University. She is currently studying African-pouched rats, [cricetomys gambianus](#), an interesting yet largely mysterious animal that uses its keen sense of smell to detect landmines. Lee blogs about urban ecology and diversity in the sciences at [The Urban Scientist](#) at the Scientific American Blog Network.