

Finding a Calling, Helping NIST Improve Science Education

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By the time this will be published, the fifth annual NIST Summer Institute for Middle School Science Teachers will be over. But as I write this essay in July, the institute begins 10 days from today and I'm teetering between excitement that the teachers are coming and terror that I forgot something or that some of the sessions won't come together perfectly.

The NIST Summer Institute started in the summer of 2007 as the brainchild of then-Chief Scientist Hratch Semerjian, who secured funding for a two-week program. Hratch knew that I had been a high school science teacher in rural Texas before returning to graduate school, ending up with a Ph.D. in analytical chemistry, and coming to NIST as an NRC postdoc. I remember being called to his office during the last week of May 2007 and being asked if I would build this new program.

I really wasn't interested in this opportunity to return to education and didn't want to be distracted from my scientific career. However, I ended up accepting the challenge after realizing that my background provided the ideal skill set since I had been a teacher and was now a scientist.

I didn't understand Hratch's palpable sense of relief until I started work and realized what I'd gotten myself into. Pull together a two-week program for middle school science teachers in a month and a half? Yikes!

I forged ahead and soon realized that Montgomery County middle schools are teaching at or above the level I had taught in high school. Based in large part on suggestions from Hratch and a focus group of my friends at NIST, I visited scientists from multiple OUs and asked them to talk to the teachers about their research and lead them in activities that could be used in the middle school classroom.

Skip forward to the present: the Summer Institute (<http://nist.gov/iaao/teachlearn>) has gone from 12 local teachers to 20 teachers from multiple states; we've become a nationwide program with congressional funding. As far as I can tell, no other federal agency has a similar program; our strength is the scientists and engineers that are the foundation of the program.

Alumni of the program have gone on to lead their students in such NIST-inspired activities as building hand-held spectrometers, measuring the speed of sound using a circuit they built, and holding a school-wide World Metrology Day.

I've learned that my background as a high school teacher and my experience as a scientist make me a bridge between NIST and educators. In my everyday job, I spend most of my time learning about the research of the scientists I work with. In the back of my mind is always the idea of how to take what I'm learning and figure out ways to take it into the classroom. That's the idea underlying this program: translating research into the classroom.

The success of the Summer Institute and my newly discovered passion for working with teachers have also spawned "Science Afternoons at NIST," in which teachers periodically return to the agency for an afternoon with a focus on one particular topic. I



Credit: Denease Anderson

The author of this essay (right) watches middle school teachers Karoline Sharp and Anne Fichter experiment with how to measure the diameter of a round object.

enjoy watching the teachers because they come in tired from a day of teaching and as I watch they are transformed and energized by the science—they remember their own passion for learning and science.

Teachers invariably love these programs and I always get requests from several who want to work at NIST or apply for the SURF program. This past summer, we had three alumni of the Summer Institute participate in a new six-week Research Experience for Teachers program, doing scientific research in the lab for NIST scientists and developing ways to translate the research into the classroom.

I know that we as scientists can improve science education by being involved in local classrooms. I've learned that most middle school science teachers do not have degrees in science and that many have never met a scientist. That's why the teachers' opportunities to interact with NIST scientists are key to showing them that scientists are people, too—and that's the first step in our scientists serving as role models. Last summer one of the teachers from Florida asked me to take a picture of a male NCNR scientist with a long ponytail because her son didn't believe that scientists could have long hair. I took the picture and continue to look for scientists—regardless of their hair length—who can translate their research into the classroom and serve as role models.

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Postscript: Now—a month after I wrote the preceding part of this essay—the 2011 NIST Summer Institute is over and I am basking in the glow of a wildly successful event, thanks to the involvement of more than 100 NIST staff. The school teachers left full of renewed enthusiasm for science and excited to have developed relationships with NIST scientists and engineers. Now if they have questions about science or anything related, they know whom to contact. And already I've heard from several that this was the best training they've ever had. As for me, it's back to my regular job—and on to preparation for upcoming Science Afternoons at NIST. Interested in getting involved? Contact me!