

Emory Science Grad Students Partner with Area Teachers

A program at Emory University is pairing graduate students in science with Atlanta-area middle and high school teachers to develop innovative lessons focused on big ideas in science and math. The program is an effort to help reverse lagging science achievement by using a new set of hands-on, problem-based teaching techniques, part of a growing movement in science education.

Called PRISM (Problems and Research to Integrate Science and Mathematics), the program's goal is to "create a compelling need to know" within students, according to Jordan Rose, PRISM coordinator at Emory's Center for Science Education.

"Problem- and investigative case-based learning make science come alive for students by demonstrating that science is real and integrated into our lives. Such methods engage students in the process of scientific inquiry by asking them to collaboratively address real-world problems. Students become self-directed learners, critical-thinkers and problem-solvers," says Rose.



The program uses real-world applications to teach the basics of science. Instead of focusing on minutia and dry lectures on science theory, the students learn detail through concepts; for example, principles of chemistry can be communicated through looking at water quality issues. Lessons developed among this year's group include one on infection control and outbreak that involves swabbing surfaces at the school to find and identify different types of bacteria. Other students will learn about math and physics by building model planes using basic principles of engineering.

"Problem-based learning makes you own your knowledge—you have to seek out and discover the answers for yourself instead of having it handed to you," says Yolanda McKee, a health occupations teacher at Carver High School in Atlanta and a 2005 PRISM participant.



Since 2003, the program has partnered with 39 teachers in 13 middle and high schools around the metro Atlanta area. Eighteen teachers participated this year with Emory graduate and undergraduate partners in the classroom.

The Center for Science Education is in the midst of doing a comparison study of recent science test scores, but in the meantime many teachers have reported that students who were previously flunking science, or struggling to pass are now making Bs and Cs.

Rose says the program also has the added benefit of helping graduate students become better scientists and teachers themselves.

"Our graduate fellows overwhelmingly report that they are more confident teachers, improved communicators, better team-players, and more committed partners with K-12 educators," Rose says. "Some even have told us that they are asking better questions about their own research, and feel better prepared to enter the professorate or wherever their career paths might lead them. As one fellow told me, 'If you can handle 30 seventh-graders for a year, a class of undergraduates doesn't seem so daunting.'"



What participants have to say about PRISM

My experience with PRISM has had a tremendously positive effect on me on a number of levels. I am much more comfortable leading a classroom, whether students are in their twenties or their tweens. I've received comprehensive training in pedagogical techniques that capture student interest, foster critical independent

thinking and boost integration and retention of key concepts at all educational levels. I've learned new ways of integrating technology into the classroom, and have gained valuable insights into managing classrooms large and small. I've also received valuable mentorship for my own professional development, which has helped me in putting together my teaching portfolio and articulating my teaching philosophy.

- Bethany Turner, PRISM Graduate Fellow

Creating relationships with grad students and professors [made me] feel connected with the 'academic world.' It was great to be part of the bridge between academia and public education.

- Teacher Fellow, 2003-2004

I could see how much the kids learned in just one week about global warming, fossil fuels, greenhouse gases and the North Atlantic Current. I loved how the kids went from not knowing much about these subjects, to arguing about what could happen if we have an ice age.... Kids have so much more fun learning when they are allowed to research and work together as a group instead of just reading a boring old textbook. I think we should utilize Emory and their resources as much as possible in the future.

- Case Facilitator and Parent of 6th grader, 2004



I had a great time. This is something I always wanted to do. Investigating is one of [my] dreams and goals. I can not [wait] any more until Emory University comes again. In the future I will be a student at Emory.

- 6th grader, 2004

While student data are still under analysis, teachers report their students are more motivated to learn and they attend class more often and retain concepts longer than with traditional teaching methods.

- Jordan Rose, program associate for the Center for Science Education (CSE)

The PRISM fellowship gave me the opportunity to learn about problem-based and investigative-case based learning techniques, and allowed me to explore teaching methodologies that I had only dreamed about using in my classroom! The impact of PRISM on my career will reach far and wide.

- Jennifer Holtzman, PRISM Graduate Fellow

For more information on PRISM see:

PRISM website: www.cse.emory.edu/prism/index.htm

Emory Report article, August 1, 2005: [PRISM shines light on learning methods:](#)

This article, *Emory Science Grads Partner with Area Teachers*, comes from a press release issued by Emory University Media Relations Office.