Thinking outside the book

GHS science teacher takes summer research on the road, into classroom

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When teachers can incorporate life experience into the classroom to help further their students' potential, it takes education to a whole new level.

Kris Chapman, a science teacher at Greenville High School, has spent the past two summers working with Research Experience for Teachers funded through the National Science Foundation. The program pays for teachers to work in research laboratories immersed in real cutting-edge science, he said.

The research has taken place fairly locally, in Dr. Rick Relyea's laboratory through the University of Pittsburgh, which maintains one of the leading field research laboratories in the country called the Pymatuning Laboratory of Ecology — located just 15 miles north of Greenville outside of Linesville.

While Chapman has worked on many projects, the majority of his research has focused on sexual selection as an evolutionary force, and the effects of herbicides and pesticides on amphibians.

Last summer, he presented his research at the Ecological Society of America's annual meeting in Pittsburgh. He also has co-authored a scientific paper that is under review at the Scientific Journal, "Animal Behaviour."
More recently, he was asked to present at the National Science Teacher Association's annual meeting in San Francisco, Calif. A program called STEM, which stands for Science, Technology, Engineering, Mathematics, funded all his travel expenses so that he could present his work to 250 teachers and scientists from across the country.

“Specifically, they wanted to know how my research experience has translated to my classroom,” he said. “I also presented my work to the person in charge of funding for NSF. It was a fantastic experience that let me network with teachers from around the country, and hopefully express the importance of such programs such as RET and how it can make us better teachers.”

As crucial as his part was, Chapman is very modest about his professional accomplishments, focusing more on what it has provided his students.

“Through my experience, it is my students who have gained many opportunities,” he said. “Currently in my AP biology class, we are working with another high school, as well as researchers from Pitt on a scientific experiment investigating the evolution of plastic traits in daphnia, a common freshwater crustacean. The kids love it and are learning college-level material in high school. They get to experience several guest speakers from Pitt and the students get the chance to network with many college professors and researchers.”

Chapman said his students will have ultimately networked with around 13 well-respected scientists.

“When they go off to college next year, they will have connections,” he said.

The process has also taught them “to think scientifically, pose a question and figure out the answer, and have a hand in designing the experiment,” he said. “And it’s a big question they are trying to answer.”

The original, novel experiment with the daphnia examines how organisms are able to change their traits in the face of challenges such as lack of food and presence of predation, he said.

Because of the outside funding Chapman received, there has been no cost to Greenville School District for materials, special speakers or equipment, but it has provided a much higher level of science for the students, especially in the area of equipment they now have to use and the quality of scientists with whom they work. The organisms with which they are working were shipped from Belgium.

A major goal through it all is to get the students’ research published in a science journal.

“They are trying to find out what is the most relevant, most publishable research,” Chapman said.

“Dr. Relyea would say, ‘Science without publication is just recreation,’ and what these students are doing is new, nobody else has done it, so I want them to get it published.”

Students last week were eager to begin work on their glass jars filled with microscopic organisms.

“I think it is amazing that we get to do this,” said senior Steven Pickering. “We are one of two schools in the United States that Pitt chose to do this, all because of Mr. Chapman. It’s pretty incredible that he has so much trust in us and sees the kind of potential in us to make us a part of something so spectacular.”

Pickering said he and his classmates are taking this opportunity very seriously.

“It’s a great feeling to be so respected by your teacher like this,” he said. “We all understand how important it is.”

Chapman said The University of Pittsburgh has been instrumental in making everything a possibility. Dr. Allison Slinsky Legg is the outreach coordinator for Pitt, works to bring science to high school classrooms and has provided much of the funding to supply the classroom with needed materials; Dr. Rickey Cothran and Aaron Stoler helped design and run the experiment with the high school kids students; and Relyea’s lab has allowed him to work as an RET.

“Pitt has been off-the-charts amazing,” Chapman said. “All in all, it has been a fantastic experience and the trip to present my work in San Francisco was an amazing culminating experience.”

Students in the class whose names are geared to be published include Stephen Bendig, Jared Bowen, Valerie Desilva, Sara Dopierala, Josh Douglas, Sebastian Estrada, Jake Gearhart, Charles Griffith, Daniel Grimm, Jeremy Heath, Steven Hecking, Zack Johnson, Sarah O’Malley, James Pickering, Steven Pickering, Collin Roberts, Jordan Rupert, Kyle Semroc, Callie Shilling, and Kenny Surano.