Undergraduates search for answers and enrichment through research

Part of a series profiling undergraduate researchers provided by University of Pittsburgh Office of the Provost.

By Niki Kapsambelis

In academic research, as in life, there are no answer books. Sometimes problems have no set solutions; sometimes, you have to fill in the blanks.

That's why Joe Grabowski firmly believes that research is such a key ingredient in an undergraduate's college experience. As the director of undergraduate research for the School of Arts and Sciences, Grabowski has been encouraging students to explore the unknown from the earliest days of his career as a faculty member.

"You teach students — and they get to practice this — how to solve problems," he says of his role. "Research is completely unscripted … They come to understand that experiments fail, and that's OK. Not everything works out. You give it your best shot; sometimes it fails."

The real gain, regardless of what experimental results are obtained, is the encouragement of a student to become a more active participant in his or her education.

"Students who have been involved in faculty research tend to have enhanced learning experiences through the whole scholarship enterprise, that whole 'take ownership of a problem' issue. They tend to get much better learning outcomes," he says.

Toward that end, about five years ago Arts and Sciences established the Office of Experiential Learning, which serves as the campus clearinghouse for any student who is interested in undergraduate research. Faculty use it for boilerplate and administrative support in obtaining grants or to connect with students needed for projects.

The office also administers endowments for summer fellowships. Grabowski, an associate professor in the Department of Chemistry who has been at Pitt since 1991, is the faculty's voice at the OEL.

Grabowski also has a more personal reason driving his passion for research. When he was an undergraduate, a faculty member tapped him for a project, and "it changed my entire career," he recalls. "I was headed to med school until I got into a research lab."

It was through Grabowski that junior chemistry major Emily Schuppert delved into her first project, which involved characterizing the emission properties of a series of fluorescent compounds. For about 10 hours a week, she shot a laser at molecules, putting them into an excited state, then measured the energy they released as they relaxed back to ground state.

Fluorescent molecules are used in many applications — for example, forensic scientists will use them to detect body fluids. By discovering which molecules are the most efficient, scientists will be able to determine the optimal way of using fluorescent compounds.

"She did fantastic, absolutely stellar," says Grabowski. "She had no course experience that would prepare her for the concept, the technique, or the molecules. This was a chance for her to play with some high-tech equipment in an apparatus that we dreamt up and built … She's getting data that nobody else has seen."

Schuppert, a native of Spring City, Pa., says the experience has helped her think about the possibility of pursuing a career as a high school chemistry teacher.

Grabowski points out that since chemistry is an experimental discipline, having experience with authentic research will better help her as she teaches introductory courses. She plans to serve as an undergraduate teaching assistant in the spring 2008 semester.

"It's a great program," she says of undergraduate research. "You get invaluable experience from being involved. If you don't try it, you'll never know if you love it or hate it. It can help you define what you think you want to become later in life."

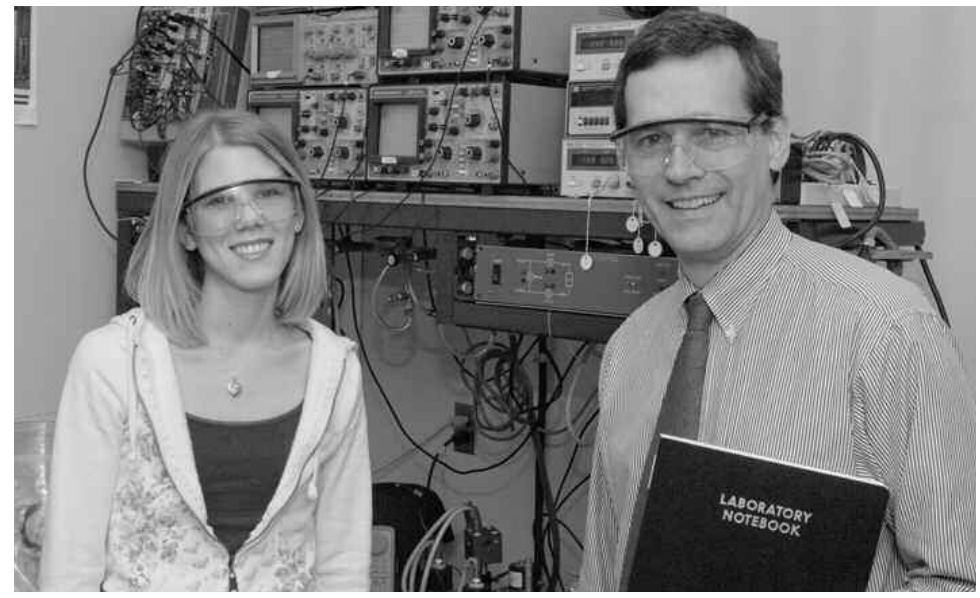
Schuppert chose Pitt for its strong reputation in the sciences and fell in love with the city when she came to visit. The opportunity to become involved in research was an added bonus.

"You can't really have any expectations, because you don't necessarily know what's going to happen," she says. "There is no prescribed result that you're supposed to get. There isn't a TA constantly looking over your shoulder."

"Emily is what I would consider to be the perfect candidate for an undergraduate research experience: a student who is really unsure about what her next options are, a very talented student, a very hardworking student, who is seriously considering very different options," says Grabowski.

Though balancing her time in the lab with classes was tricky, Schuppert says she feels richer for the opportunity.

"You are smarter after having that kind of experience," she says. "And you gain knowledge in a different way, because you never really get the same kind of laboratory setting again. It's more hands-on learning, which is really important."



Undergraduate researcher Emily Schuppert has been studying fluorescent molecules in the chemistry laboratory of Assistant Professor Joe Grabowski and her work has stimulated an interest in a high school teaching career.