

# Engineering empathy: Faculty works to build empathy into engineering program

November 23 2015, by Mike Wooten Laurie Anderson

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When Mark Hain decided to leave his job as an emergency medical technician to pursue a degree in environmental engineering at the University of Georgia, he assumed he would immediately get his hands dirty designing and building projects. Instead, he found himself in a design course analyzing and discussing in detail how his work as an engineer might impact others—and questioning whether certain projects should be built at all.

The class was one of the first in the UGA College of Engineering designed to introduce [students](#) to empathy as a learned skill. Researchers in the college and in the School of Social Work are investigating how engineering students can best develop empathic skills to enhance their approach to professional practice. The work is supported by a three-year grant from the National Science Foundation.

"I felt like I was an empathetic person before the class, but I never thought about applying empathy to engineering and projects that I might be designing," Hain said. "It made me think about things in greater depth and challenged me and the other students to understand the direct and indirect impact of our work."

Empathy—being sensitive to another person's perspective—is as necessary for engineers as it is for social workers, according to Shari Miller, an associate dean in the School of Social Work and co-principal investigator on the project.

"Just because a project may be expertly crafted on a technical level doesn't mean it will be the right solution in the context of a community and its needs," she said.

Although future engineers get a thorough grounding in technical skills, their curriculum does not typically provide much exposure to considering how a project might affect various stakeholders or how those stakeholders might contribute to a project. Once in the workplace, however, engineers often encounter challenges that require an empathic orientation. They may be asked to develop projects with a diverse group of partners or design projects that require extensive federal or state impact assessments.

"As issues of sustainability and other global problems emerged in the 1990s, educators began to realize that fundamental changes were needed in the way engineering was taught," said Joachim Walther, an associate professor in the College of Engineering and co-principal investigator on the project.

While an increasing number of scholars believe empathy training should be a crucial component of engineering education, they lack proven, evidence-based teaching models that can be used in classrooms.

Drawing from the longstanding practice of teaching social work students how to keep the client's viewpoint in mind, the research team—which also includes engineering faculty member Nicola Sochacka—will develop various methods of teaching empathy and will research their impact on engineering students' learning. The team will use the data to build a model for incorporating empathy into engineering education and other disciplines.

"This project has the potential to transform [engineering education](#) and practice by making the field accessible to a more diverse range of

students, and, at the same time, it can provide students with practical skills that may enrich their professional performance," Miller said.

The team's work is part of a larger interdisciplinary research program between social work and engineering and builds on a [pilot project](#) developed by Miller and Walther in 2012 while they were both Lilly Teaching Fellows in the UGA Center for Teaching and Learning. The pair created a series of lesson modules that taught empathy through activities that emphasized interpersonal communication, engagement with diverse stakeholders, role-playing, self-reflection and collaborative problem solving. The activities were integrated into an engineering design course that challenged students' usual approaches to problem solving.

"Students were far outside their comfort zones at first," Walther said. "But by the end of the semester, many students came around to appreciate the exercise."

Michael Brewer was one of the students who participated in the pilot project. He remembered body language and personal space exercises that he described as "extremely uncomfortable." Brewer came to understand the value of the exercises and now works as an undergraduate research assistant on the project.

"Engineers have a huge impact on society, so it's important that they are able to think in human terms about the impact of their work," Brewer said. "There are all sorts of components to real-world engineering that exist outside of the perceived technical problems and the potential solutions."

Reactions like Brewer's and other students bode well for the new project, Walther said. "We knew we were on the right track when one student summed up the experience with the comment, 'All engineering

majors should be required to minor in [social work](#)."

Provided by University of Georgia

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