

Mason Professors Kick Up Teaching Techniques With NSF Grant

By Michele McDonald

A George Mason University professor has a National Science Foundation (NSF) grant to help university professors step up their teaching game. What George Mason professors learn could be applied to universities nationwide.

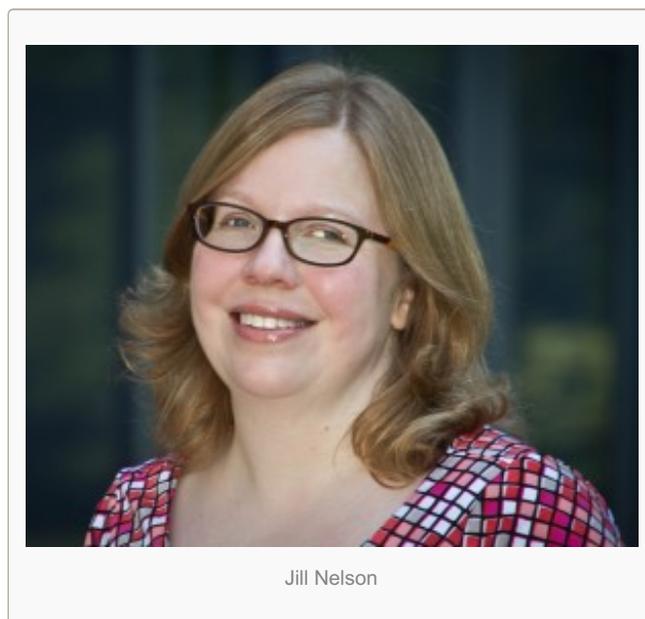


The plan for the three-year \$572,000 NSF grant is to close the “valley of death” between research on the latest learning techniques and moving that research into classrooms where students can benefit, says [Jill Nelson](#), an electrical and computer engineering professor and study leader.

These innovative methods can be as simple as using notecards to call on students in class and keeping track of their progress/attendance to working on problems in class in place of a traditional lecture, Nelson says. For Nelson’s students, the process could include arguing about math concepts while astronomy students could dive into massive amounts of data.

Science, technology, engineering and math (STEM) professors are working to find out what different approaches look

like in disciplines from engineering to physics. They’re looking for best practices that work. The project is a collaboration between Mason’s Volgenau School of Engineering, the [College of Science](#) and the [College of Education and Human Development](#).



Professors, undergraduates and graduate students meet to evaluate and discuss what they try out in their classrooms, as well as to support each other and add new members to the club.

Nelson jokingly likens the approach to the Tupperware model, where small groups get together to pitch and buy the product.

“It’s proselytizing,” Nelson says. “We’re trying to get people to change their way of teaching—it’s a leap.”

Helping make that leap are group leaders: Cody Edwards, Provost’s Office/biology; Laura Kosoglu, civil, environmental, and infrastructure engineering; Craig Lorie, electrical and computer engineering; Mary Nelson, STEM Accelerator/math, Kathy Pettigrew, forensic science, Jessica Rosenberg, astronomy, and Reid Schwebach, STEM Accelerator/biology. They’re working with three education researchers from CEHD: Anastasia Samaras, Lori Bland and Margret Hjalmarson.

The group is using a “SIMPLE” design framework that’s broken down into six principles for faculty development: The model is Sustainable—ongoing small groups meet and provide support; it uses Incremental change; it provides Mentoring; it is People-driven; and it focuses on an interactive Learning Environment. It also uses a design memo to detail how the innovative teaching method was used and the outcomes.

The grant, Schwebach says, shows Mason is “at the cutting edge of advancing a new framework of faculty development and university instruction.”

It’s also giving Mason students insight into how to teach. Biology major Alex Johnson, who grew up in Manassas, plans to become a high school biology teacher. She says working with Schwebach on the notecard system, which uses 3-by-5 index cards to call on students in class, shows her how a simple Socratic method can boost student participation. The cards also track attendance, and Johnson is researching how card scores predict exam performances, so the instructor can help students get better grades.

The project also could mean more jobs for Mason graduates because the SIMPLE framework makes them better teachers by challenging them to use innovative teaching methods that prepare them for the next step in their careers, Schwebach adds.

Richmond native Morgan Gostel, who’s working on his doctorate in the Environmental Science and Policy program and is an Ellen Joyce Teaching Award winner, is teaching his fellow graduate students how to improve their science writing.

“Just being able to talk about teaching is important,” Gostel says. “It’s a conversation that graduate students don’t have often enough, and can change how the classroom is taught.”



Mathematical Sciences STEM Accelerator. Photo by Evan Cantwell