

## **New Insights About How Students Learn and How to Teach Them More Effectively**

Through the educational research projects, virtually all of the instructors had “aha” moments about student learning as well as their own teaching and how to improve it. Here are some of their comments:

Greg Story, associate professor of physics, feels as though he was a co-learner with his student assistants during the project. Through developing a new set of homework assignments along with his undergraduate assistants (students who had already taken the course), he learned about the issues that students had as he saw lingering misconceptions about physics. “I learned so much,” he said. “It really helped my teaching. Each week we went through a new set of homework assignments, so I could find out for any given subject what the misconceptions were that students had.”

Dave Westenberg, associate professor of biological sciences, says he thinks a lot more about the student perspective now. Through his lab redesign, he discovered that the students don’t “need” him in the same way. He can trust them to figure out what they need to do in the lab.

Bonnie Bachman, professor of economics, said the project forced her to find new resources in order to include distance students in the active learning. These have now been incorporated into her courses on a regular basis.

Jossalyn Larson, assistant teaching professor of English, found out how valuable instructor-student connections were in the classroom. “I think there is a lot of pedagogy tangled up in what I was doing, but my core desire was to get to know my students better. In doing so, I was able to get on an individual level with each of them to figure out what each of them wants and need.”

That was important to her, coming to a STEM institution with her liberal arts background. She found that the students were very different from her previous institution, and the educational research project helped her understand those differences and how to serve students better.

Katie Shannon, associate teaching professor of biological sciences, talked about the evolution of her teaching style. “When I started, it was primarily lecture. It was easier, and that is how we were taught,” she said. “I did the flip(ped classroom) because I wanted to give them the opportunity to problem-solve in class, and I think that has been really useful.

“I think that educational research and course redesign have changed my focus in the classroom. I have moved away from a more passive style where I lecture and expect students to memorize facts to an active style where students participate in problem-solving in the classroom, and my role is to facilitate their conceptual learning.

“I think doing educational research impacts what I am doing in the classroom, so that I can assess what is working and what is not and help students as much as I can.”

Susan Murray, professor and chair of psychological science, said that working with a student assistant on her project helped her realize how differently things are seen from the perspective of a novice learner. She found out that even her upper-level students weren’t always able to judge what was important to learn, and she needed to provide them some scaffolding to gain that perspective. She also became aware of students’ different learning styles: “When I first taught, I assumed everyone had the same learning style as me,” she said. “I realize now ... things that don’t matter very much to me can matter very much to another person.”

For Beth Cudney, associate professor of engineering management and systems engineering, the educational research provided a new paradigm of continuous improvement for her teaching. "I would never go back to the old way of teaching," she said. "I would do it again if I had more courses to redesign. I teach continuous improvement ... what else can I improve?"