https://tucson.com/news/local/new-ua-program-equips-future-stem-professors-with-inclusive-teaching-skills/article_9953feb6-47d7-11ec-92d2-47b82ed94887.html

ALERT TOP STORY

New UA program equips future STEM professors with inclusive teaching skills

Kathryn Palmer
Nov 24, 2021

Morgan Carter is a postdoctoral fellow at the University of Arizona's School of Plant Sciences. She wanted to get more teaching experience before landing a faculty job and got the opportunity to co-teach part of class with a senior faculty mentor last school year.

Courtesy, Morgan Carter

When Morgan Carter was working on her undergraduate biochemistry degree in North Carolina, she was already taking note of how her professors managed the classroom.

“I knew I had a career goal of being a professor and I knew I wanted to teach one day,” said Carter.

She isn't far away from achieving that goal. She graduated with a doctoral degree in plant pathology last year, and is now completing a three-year postdoctoral fellowship at the University of Arizona.

When Carter reflects on the learning experiences that helped get her to this point, scribbling down notes in a lecture hall doesn't stand out. But, in-class problem solving, real-world applications and project-based learning does.

"I realized how much more engaging the few classes that I had that used more active learning approaches," Carter said. "As I went through graduate school, I learned more about how active learning was becoming a bigger and bigger thing, which is why I knew I needed to get a little more serious about my teaching experience to really be a good professor and make sure my students walk away from my course with something."

Postdoc Pathway Program

That's why last school year, she participated in the pilot cohort of a new professional development program at the UA called the Postdoc Pathway Program, which is focused on training STEM-focused postdocs on how to teach effectively.
Often, research demands of those fellowships, which typically run between one and three years at any given institution, are emphasized more than gaining teaching experience.

To combat that, postdoctoral fellows who participate in the two-semester program at the UA are matched with a faculty mentor and they teach part of a course together. The idea is that postdocs will have meaningful teaching experience before taking on the demands of their first faculty job, which typically includes both research and teaching duties.

This semester, the first cohort of nine participants have been training and in the spring they'll start teaching alongside their mentors.

"I liked that I wasn't responsible for teaching the whole course on my own from scratch. I could just take pieces of the course that were closest to my knowledge and try a new way of bringing students to that knowledge," Carter said. "That was so fulfilling in a way that lecturing just wasn't."

The pathway program's launch comes one year after the UA joined the **Center for the Integration of Research, Teaching and Learning network**.

Formed in 2003, the network includes more than 40 colleges and universities and is focused on preparing STEM graduate students and postdocs for teaching positions at colleges and universities. But the network didn't have a program specifically designed for postdocs with an interest in teaching, so the UA created one after students expressed interest.

"We joined this network as part of larger institutional push to increase the effectiveness of teaching on our campuses, especially in the STEM fields, because that's traditionally an underrepresented area in teaching preparation and there's higher attrition for students," said Kristin Winet, program administrator for CIRTL and lecturer in the English department, who organized the planning committee for the program. "We're trying to bring more inclusive teaching practices to campus."

Closing achievement gaps

According to the most recent available data from the UA, 33.5% of first-time, full-time students at the UA started off as STEM majors in 2017. Four years later, 25.2% of them had not completed or were no longer pursuing a STEM degree.

So, in addition to shaping strong college-level teachers in the short-term, the program's long-term aim is to help close some of the achievement gaps in STEM fields.

Although a STEM-related degree can lead to an in-demand job, students from underrepresented backgrounds don't get those degrees as often as their more advantaged peers.

For example, in 2018, Hispanic students earned 12% of bachelor's degrees, 9% of master's degrees and 6% of research doctorates in STEM fields, according to a report from Pew Research Center. That same year, no more than 9% of Black students earned STEM across bachelor's, master's and doctoral levels.

Research suggests these trends are the result of multiple factors, including the inherent challenges first-generation college students (who are disproportionately low-income and students of color) face and inadequate K-12 instruction.

Those barriers to success are often exacerbated by the intimidation and isolation of learning in big lecture-style courses that don't offer much professor-student interaction.

So, not only does the co-teaching program give up-and-coming faculty members the classroom experience they'll need to engage a diverse pool of students, it also benefits the UA faculty members mentoring those postdocs.

"They get the chance to actually sit and reflect on their teaching. They meet every week with their mentee and talk about best practices in teaching," Winet said. "They actually experienced this growth in their own teaching and their understanding of themselves as teachers because they had the chance to finally sit down and think about things."

That's what happened to Betsy Arnold, a plant sciences professor at the UA, when she was paired with Carter, the plant sciences postdoc, to teach a biology course last spring.

"Even though I have experience teaching, it's a learning journey and there's always ways to improve as an instructor," Arnold said. "By having someone who was coming in to learn from the process, it helped me step up my game. It helped me make sure that I was more up-to-date in the field and made me more attentive to being inclusive to the diversity of students in the course."

From Arnold's perspective, exposing more students to the critical thinking processes STEM curricula require is more important than ever.

“That’s simply because of the huge amounts of information we constantly receive, and the need to develop the skills to filter emotion, opinion and fact to come up with clear thinking and ideas,” Arnold said. “The timing of this program is so important because it creates the opportunity to empower the next generation of talented, committed and super engaged young scientists who want to teach and who recognize how important teaching can be to advancing not only societal needs, but also the quality of science itself.”

Kathryn Palmer covers higher education for the Arizona Daily Star. Contact her via e-mail at **kpalmer@tucson.com** or her new phone number, 520-496-9010.

Kathryn Palmer
Higher education reporter
Kathryn Palmer covers higher education for the Arizona Daily Star. Contact her via e-mail at kpalmer@tucson.com or at her new phone number, 520-496-9010.