

Broadening the STEM Identity

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BROADENING THE STEM IDENTITY

According to National Science Foundation (NSF) data, students who are academically talented but financially needy are the most likely to drop out of science, technology, engineering, and math (STEM) programs.

With the support of an NSF grant, Dr. Manuela A.A. Ayee, an assistant professor of engineering, wants to change that narrative over the next five years.

Ayee was awarded a \$649,947 grant from the NSF for her project, titled "Retention of Undergraduates in STEM: Reducing Barriers to Success in Mathematics, Engineering, and Computer Science."

"Often, these students are not like the traditional STEM population—they might be female, from racial minority groups, or first-generation college students," says Ayee. "They might feel different from the rest of the STEM population—like they don't fit within the STEM identity. If you are already financially strapped and feel like you don't belong, then you're less likely to continue."

Through this project, Ayee and her Dordt colleagues hope to better understand the barriers to retaining academically talented, low-income students in STEM disciplines and develop interventions that diminish these barriers.

"We will implement identity-building experiences with student cohorts, and we'll introduce new curricular pathways that will help students easily transition from, say, a two-year program into a four-year STEM degree," says Ayee.

Some of those cohort identity-building experiences will include peer mentoring, workshops, and partnerships with Sioux Center businesses such as Interstates, Link Manufacturing, Civco Radiotherapy, and Engineering Design Associates (EDA).

What excites Ayee most about the grant is that Dordt will be able to award \$410,000 in STEM scholarships and \$10,000 for scholars to attend conferences within their discipline.

"These scholarships will ease the



JAMIN VER VELDE (99)

"We want students, after they graduate from Dordt, to successfully enter the STEM work force or to go on to graduate school," says Dr. Manuela Ayee.

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— Dr. Manuela Ayee, engineering professor

financial burden for students. It will get rid of a barrier that can cause much stress, such as how they are going to pay for tuition," she says.

Ayee has a personal reason for being passionate about the project.

"I was a traditionally underrepresented student in STEM, being a woman and a racial minority," she says. "My family were my cheerleaders and were there to encourage and support me no matter what."

Many people don't have that type of support. Without it, some drop out of school.

"Especially if students don't have that level of support in their lives, I want Dordt to stand in the gap for them," says Ayee.

Ayee will partner with other faculty on-campus to implement the grant, which began September 1, 2019, and ends August 31, 2024. They predict the grant will result in increased retention of first-year engineering, mathematics, and computer science majors; improved overall STEM graduation rates; continued high post-degree STEM job placement and graduate study rates; and the development of new curricular pathways into STEM four-year major programs.

"This grant will help Dordt advance our task as an institution," says Ayee. "We want to create effective kingdom citizens, and that also includes students who might be underrepresented within STEM fields."

SARAH MOSS ('10)