

TRESTLE Mini Seed Grant Proposal, April 2017

1. Project Title and Contact Information:

Increasing Diversity in STEM through the Improvement of the Math Sequence
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2. Project Rationale:

College Algebra is the first and lowest-level course in the math sequence for STEM majors. Due to low persistence rates from College Algebra to Precalculus to Calculus, the typical STEM sequence for underprepared and often underserved student populations, the Math Department is no longer offering College Algebra after Spring 2017. However, the Student Academic Success Center (SASC), a program dedicated to supporting underserved and diverse student populations, has successfully guided students through this math sequence and plans to continue to offer the course.

As the only department offering this preparatory course, we are hoping to utilize TRESTLE funds to further develop the course design and pedagogical approach, with the overarching goal of increasing diversity in STEM majors. The course will be improved through the creation of a placement and self-assessment process, curriculum refinement, and the implementation of new technologies. The placement and self-assessment processes are essential pieces to student success, and these processes would be developed to assist with initial student placements (for pre-registration into fall courses) and during the first week of class (to determine students' levels of preparedness). The curriculum for College Algebra would be modified to be more inclusive of our student populations. This would be accomplished by choosing activities and applications that represent diverse student identities, including people of color, women, and non-binary gender representation. Lastly, the SASC Math Program will be implementing new online software, My Open Math, in Fall 2017. The decision to utilize this open source technology was made for several reasons. My Open Math is a free software and textbook platform for mathematics and is completely customizable, enabling instructors to create their own homework questions and assessments. The software will support the self-assessment process by providing a platform and grading mechanism for the first-week self-assessment. In addition, the software will be used to build a more inclusive curriculum by allowing our faculty to create questions and homework assignments that represent our student populations.

3. Broader Impacts

With improvements to College Algebra, we believe more students will persist through the math sequence, and therefore persist in a STEM major. If we find that the improvements have an effect on persistence and completion, we will share our results with the Discipline Based Educational Research group and with faculty members in the Mathematics and Applied Mathematics Departments. We will also communicate with

other STEM-support programs for underserved students, such as the Gold Shirt Program and Miramontes Arts and Sciences Program.

4. Assessment

I plan to assess the improvements through several calculations. I will analyze past semester data on issues with math course placement by looking at students' ALEKS scores and their math course enrollment (i.e. did students take the appropriate course based on their ALEKS score?). Then I will analyze past semester final grade data and compare it to the final grades of the improved course. The last analyses will be completed over the following year and will measure student persistence rates through the sequence and major choice at the end of the study.

5. Budget

The TRESTLE funding would be utilized to hire a faculty member at an hourly wage, to provide a tablet to the faculty member, and to provide training on the new technology to SASC math faculty. The faculty member would be paid \$35 per hour for 20 hours of work to develop the self-assessment and curriculum improvements. The faculty member would also be provided with a Surface Pro tablet (\$500-\$600), which would allow them to develop and test the materials and would be used in the classroom to teach with the new software platform. The one-day technology training for SASC math faculty would occur in early August and would provide the instructors with skills to use the software. The training event would cost around \$150 and would include a room reservation, lunch, and printed materials.

6. Resources Leveraged

The cost to improve the course is around \$1,450. The Student Academic Success Center would supplement half of the instructor hourly wage (\$350), a portion of the training costs (\$50), and the setup of the tablet to the network and classrooms (\$50).

7. Agreement to Expectations

I agree to fulfill the expectations of successful applicants as stated by the Trestle Mini Seed Grant Proposal document.