



Promoting Academic Success of Economically Disadvantaged, STEM-Interested, First- and Second-Year Undergraduate Students via the ACCESS in STEM Program at University of Washington Tacoma

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Abstract

We are facing a national challenge of low retention rates for STEM-interested students. At the University of Washington Tacoma (UWT), a public, predominantly undergraduate, minority-serving institution (Asian-American, Native American, Pacific Islander, AANAPISI), only 28% of high achieving (high school GPA>3.0), STEM-interested at entry, Pell-eligible, first-time-in-college (FTIC) students undergraduates have entered a STEM major by the beginning of their 2nd yr, and the proportion is significantly lower for PEERs (persons excluded from STEM due to ethnicity or race [Asai, 2020]) at only 16%, representing a substantial equity gap. To address this problem, we developed the Achieving Change in our Communities for Equity and Student Success (ACCESS) in STEM Program. Supported by an NSF S-STEM grant since 2018, the program supports low-income, STEM-interested students by providing focused mentoring, a living learning community, a course-based research experience in their first year, and scholarships in their first two years of college. Based on the Student Persistence model of Graham et al. (2013), we hypothesized that these interventions would increase retention, academic performance, and progress into and through STEM majors. Our approach builds upon existing research demonstrating the importance of early research experiences (Thiry et al., 2012) and intensive mentoring and community building, particularly in the context of AANAPISI institutions (Nguyen et al., 2018).

Methods. Quarterly and cumulative GPA and enrollment status were obtained from registrar data for program participants (N=22) and a comparison group of students who met eligibility requirements (e.g., FTIC, STEM interest at entry, Pell-eligible, and high school GPA > 3.0) but did not participate in the program (N=96). We assessed course grades in individual STEM



courses for program participants and for students from the comparison group who consented to be part of the research study (N=16) and were closely matched to participant demographics.

Results. In the first three years, the program supported 44 students. Of these, 59% were female, 74% First Gen, 8% dependents of veterans, and 33% identified as PEERs. In all, 90% held at least one minoritized identity in addition to low-income status. First year cumulative GPA was significantly higher for ACCESS scholars than the comparison group, at 3.44 vs. 3.07 ($p=0.027$); likewise, second year cumulative GPA was significantly higher at 3.57 for ACCESS scholars vs. 3.09 for the comparison group ($p=0.032$). At the start of their 2nd year, 35% of program participants had entered a STEM major, vs. 27% of other eligible students. The program did not have a significant effect on first year retention, which was 78% for program participants vs. 82% for other eligible students, but most of the participants who left UWT did so to pursue STEM degrees not available at UWT and were retained in college; in some cases, they reported that mentoring greatly helped them to pursue their new discipline.

Conclusions and Discussion. These results suggest that programs that provide scholarship support and intensive mentoring coupled with opportunities for a living learning community and early research experiences may promote academic performance and entry into STEM majors for economically disadvantaged, first- and second-year STEM-interested students. This may be of particular interest to other AANAPISI institutions, as there are relatively few published studies within this particular context (Nguyen et al. 2018). In future work, we will analyze student responses to on-going longitudinal surveys and focus group interviews to gain greater insight into how the program impacts our students. We will also explore how the ACCESS program contributes synergistically to ongoing institutional change initiatives on our campus promoting faculty development to build capacity for creating equitable and inclusive environments for our students.

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