Board 378: Scholarships to Accelerate Engineering Leadership and Identity in Graduate Students (ACCEL)

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Tracie Earned her Ph.D. in microbiology from Georgetown University, and completed 2 post-doctoral fellowships, one in microbiology and the second in developmental Biology. She was awarded a K22 grant from the National Institutes of Health. The K22 allowed her to transition to a faculty position at The University of Massachusetts Dartmouth. She continued her studies in developmental biology, using the zebrafish model. The UMass Dartmouth Bioengineering program was created in 2010, and she joined the faculty in that department transitioning out of the Biology department. Tracie is committed to student success. She was the ABET coordinator for the initial accreditation visit in 2016, as well as the most recent re-accreditation visit in 2022. While in the Bioengineering department, her research has developed into using the zebrafish to test toxicity of biodegraded materials. She is also passionate about developing programs that position her students to enter the work force and become leaders. She enjoys the students at her institution as many of them are first generation college students. She feels that her program continuously improves to meet the current needs of her students and industry constituents.

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SCHOLARSHIPS TO ACCELERATE ENGINEERING LEADERSHIP AND IDENTITY IN GRADUATE STUDENTS (ACCEL)

Introduction

This paper presents the outcomes of the inaugural year of the Accelerated Engineering Leadership (AccEL) program. The inception of the AccEL program responds to projections by the U.S. Bureau of Labor Statistics (BLS) indicating a nearly 17% growth in employment for master's-level occupations from 2016 to 2026, marking the highest growth rate across all education levels [1]. Among the disciplines experiencing the most significant growth in master's degree awards, engineering is ranked fourth [1]. Despite intentions to pursue further education, the realities of full-time employment and the extended duration required to complete a degree part-time often deter these students from achieving their educational aspirations. Literature indicates that students who continue in engineering careers typically demonstrate high levels of self-efficacy and identify strongly with the engineering community [1,2]. Although research on self-efficacy and engineering identity has expanded, it predominantly focuses on the initial college experience [3,4]. Limited research exists on self-efficacy and engineering identity among students persisting in engineering education and into their professional careers [4,5]. The AccEL seeks to address this gap by examining these factors among students who continue their engineering studies and enter the professional field. In this paper, we report on the initial programming and application and outcomes of AccEL programming.

This project will develop programs to encourage and recruit students to the accelerated BS/MS degree. The Accelerated Engineering Leadership (AccEL) program targets three essential objectives: (1) it seeks to enhance graduate degree completion among Low-Income Academically Talented (LIAT) students to meet the increasing demand for advanced engineering education in the workforce; (2) it implements evidence-based academic and student support initiatives aimed at bolstering non-cognitive skills, including self-efficacy and engineering identity, thereby facilitating the transition of LIAT undergraduates to graduate-level programs; and (3) it aspires to cultivate leaders proficient in technology, entrepreneurship, and innovation, who will contribute to and fortify the economy of the South Coast of New England—a region noted for its diversity and post-industrial economic challenges marked by significant poverty.

Results

In its inaugural year, the AccEL program generated a large applicant pool, with 46% of eligible students applying, the cohort included 8 eligible female students and a substantial number from underrepresented racial/ethnic backgrounds. Eight M.S. students were successfully recruited into the first cohort of AccEL S-STEM scholars, reflecting diversity in both gender and ethnicity, with 75% being women and/or from underrepresented groups in engineering (Hispanic/Latino or Black/African American). The program initiated the Introduction to the Research University (IRU) Seminar, equipping students with essential information to succeed in graduate studies. Of the initial cohort, half are currently enrolled in PhD programs, and the remainder are employed within their respective fields. In the subsequent academic year, the number of applicants for S-STEM scholarships grew, allowing the expansion of the cohort to thirteen students, 69% of whom are women and/or from underrepresented ethnic groups in engineering. The IRU program has been enhanced with additional workshops based on feedback from the first cohort, incorporating PhD application support and increased networking opportunities with other M.S. students in the college.

In addition to the programming for current MS S-STEM scholars, we have a "Why Grad School" workshop series to encourage juniors to consider pursuing a Master's degree. This includes career center activities, alumnae panels, personal statement preparation and time working with students to identify potential research advisors. This upcoming spring will be the first application cycle that would be impacted by this junior level programming. Lastly, we work closely with graduate program directors in each department to assist in recruiting S-STEM applicants and how to share the benefits of completing the +1 MS degree.

The 23-24 cohort of S-STEM scholars have done a great job networking and going to conferences and presenting their work. This spring six S-STEM scholars attended the NE ASEE conference at Fairfield University. They each presented their thesis research as poster presentations, and attended many sessions during the meeting. In addition, one of the S-STEM scholars has had her paper accepted to the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society this July.

Future goals

In the forthcoming phases of our research, we are poised to conduct analyses on survey results pertaining to self-efficacy as well as evaluate interviews to discern the long-term impact of the program on student self-efficacy. Responding to the feedback received, we are preparing to implement a more structured approach to ensure the Scholars' completion of an "Independent Development Plan." This plan is a strategic initiative designed to aid students in evaluating their strengths and interests, thereby facilitating informed decisions regarding their professional trajectories post-MS degree. Additionally, we are intensifying our efforts to attract S-STEM scholarship candidates from every department within the College of Engineering, with the objective of enriching the diversity within our cohorts.

References

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