Impact of Three Years of Intervention in Culturally Adaptive Pathway to Success on S-STEM Scholars

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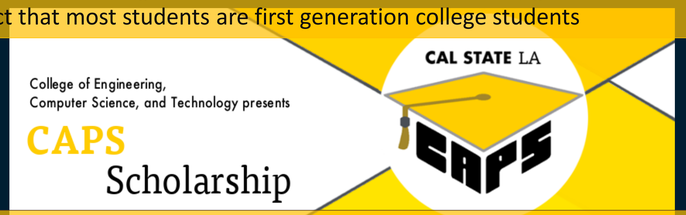
Background

- The **University** : a federally designated Hispanic-Serving Institution, Minority-Serving Institution, and Asian American and Native American Pacific Islander-Serving Institution.
- **Student body** of the College (as of Fall 2021) : over 67% are underrepresented minority (URM) students; 56% are first-generation college students; and 60% of the students are Pell grant eligible
- **Common challenges** : financial disadvantage; need to work for more than 20 hours per week; inadequate preparation for the increased rigors of college education through their K-12 education; limited family guidance due to the fact that most students are first generation college students



Objectives

- **Project goal** : to develop the **Culturally Adaptive Pathway to Success (CAPS)**, an inclusive and holistic pathway to accelerate the graduation for academically talented, low-income students in one of 4 majors (Civil Engineering, Computer Science, Electrical Engineering, and Mechanical Engineering)
- **CAPS scholarship model**: designed to originally support 2 cohorts of 14 scholars from their sophomore to senior years
- **Objectives**: at least 90% of scholars persist in the programs, 50% graduate within 5 years and an additional 40% graduate within 6 years in engineering or computer science majors
- **CAPS Research** investigates
  - (a) how these interventions affect the development of social belonging and engineering identity of CAPS scholars
  - (b) the impact of Mentor+ on academic resilience and progress to degree.
- **Sustainability**: establish a sustainable Scholars Support Program at the college/university that can be also transferred to similar culturally diverse institutions; create a culture of culturally-adaptive advising – training faculty mentors and professional adviors to create inclusive environments for strong community-building and professional development

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Program Description

Three integrated interventions to establish CAPS and activities established to implement the three specific interventions:

- **Mentor+**, relationally informed advising that encourages students to see their academic work in relation to their families and communities.
  - Training sessions for Mentor+ mentors – topics: growth mindset, leadership, intersectionality of various social identities, peer mentorship, campus resources
  - Mandatory Mentor+ advisement session for scholars (at least twice per term)
- **Peer cohorts**, providing social support structure for students and enhancing their sense of belongings in engineering and computer science classrooms and beyond.
  - Formal and informal/scholar-led cohort gatherings by major
  - Same course enrollment
- **Professional development with difference-education**, giving students support in situations where they practice reconciling how to navigate a world where others may have a different cultural script
  - Encouraged participation in one of professional events per term followed by a submission of a reflection essay
  - Participation in research opportunities and internships
  - Field trips, mock interviews, resume reviews

Recruitment

- Establishment of Structured Recruitment Process involving outreach activity in collaboration with the ECST First-Year Experience program (FYrE)
- Successful Recruitment of the Diverse Cohort Groups

CAPS Cohorts (as of Spring 2022)										
Cohort	Major	Number of Scholars								
		Male				Female				
		URM		Non-URM		URM		Non-URM		
		Recruited	Retained	Recruited	Retained	Recruited	Retained	Recruited	Retained	Total
1 (Fall 2018)	Civil Engineering							2	1	
	Computer Science	2				1	1	2	2	
	Electrical Engineering	2	1							
	Mechanical Engineering	1		1	1			1	1	
	SubTotal (Recruited)	5		1		1		5		12
	SubTotal (Retained or Graduated)		1		1		1		4	7
2 (Fall 2019 & Fall 2020)	Civil Engineering	3	3							
	Computer Science	4	4			1	1			
	Electrical Engineering	5	5			1	1			
	Mechanical Engineering	2	0			1	1			
	SubTotal (Recruited)	14				3				17
	SubTotal (Retained)		12				3		0	15
Total (Recruited)		19		1		4		5		29
Total (Retained or Graduated)			13		1		4		4	22

Key Outcomes

- **Scholar Accomplishments**
  - 100% of retained scholars are expected to achieve 5-year graduation.
  - 5 of 7 Cohort 1 scholars (70%) graduated in 4 years. 1 of 7 graduated in 4.5 years.
  - At least 50% scholars of Cohort 2 are on track to graduate in 4 years. This is significant, compared to average graduation rates of 4% achieving 4-year graduation and 23% achieving 5-year graduation (Years: 2015-2020).
  - 5 of 6 graduated scholars found their jobs during their senior years or immediately after their graduation; one pursued an MS degree.

- **Research Findings**
  - Consistently higher engineering identity for CAPS scholars relative to their matched peers over the first three years
  - The GPA of CAPS scholars

The GPA of CAPS scholars vs. the comparison group of scholars	CAPS	NON CAPS
Spring 2018 GPA (at the time of recruitement)	3.44	3.52
Spring 2019 GPA	3.31	3.45
Spring 2020 GPA	3.45	3.38
Spring 2021 GPA	3.44	3.34

  - CAPS students earned a mean GPA of 3.375 over the term of this project, compared to 3.425 for the control group
  - Graduation rates: Comparing 4-year graduation rates, 60% of Cohort 1 graduated in 4.5 years, while only 43% of the control group for that cohort graduated in the same time frame. CAPS students graduated within 4.5 years, as compared to the institutional average of 21.1% and the College of ECST average of 11.4%.
  - Career plan: CAPS scholars reported a higher commitment to careers associated with their academic major relative to their matched peers at the end of their third year.
  - No single predictor theorized to be a mechanisms of scholars success.
    - This suggests that the CAPS program may provide a holistic experience that does not disproportionately rely on a main driver. It may be that the totality of experiences is what is providing the demonstrated benefits.