

STEMing Our Roots PROJECT SUMMARY

If this proposal is funded, the San Bernardino Community College District (California) will undertake a five-year research project focused on creating new knowledge on how to effectively transition Hispanic students into STEM undergraduate programs through the first stages of that journey as community college students. Using four research teams, San Bernardino Valley College (lead institution) would collaborate with Crafton Hills College (collaborative institution) on researching, developing, piloting and implementing innovative strategies around the four major objectives of the grant:

1. Adopt innovative interventions aimed at increasing the number of students in STEM majors promote community awareness of STEM fields, and ensure every STEM student feels connected and mentored towards completion of degree/transfer requirements;
2. Provide Hispanic-STEM degree seekers with clear, coherent, and structured pathways that ensure students know what is required to succeed in their chosen program by examining institutional alignment efforts to fully articulate STEM degree programs with our regional 4-year institutions;
3. Implement evidence-based active learning strategies and interventions to accelerate and improve student mastery of STEM course content by embedding scientific applications into math courses, infusing technology into classrooms and the STEM Center, creating faculty developed workshops to support difficult concepts in STEM courses, and supporting co-curricular research opportunities to improve learning and program delivery, while building relationships among STEM students, faculty and advisors;
4. To grow the Hispanic STEM student community within our colleges.

While the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA) has substantially fewer (48%) STEM jobs than the national average, the growth of STEM positions in the region (6.5%) is projected to outpace both the state and national averages (6.3% and 5.9%, respectively, EMSI, 2018). Median hourly earnings in STEM occupations in the MSA (\$32.13) far outpace the median hourly wages in the region (\$16.41). Although, Hispanics are less likely to be employed in STEM occupations (18.9%), Hispanics constitute a larger percentage of the labor force in the region (28.8%, EMSI, 2018).

A major challenge for both colleges, as is with other colleges in the state, is the low participation in STEM programs lower academic performance in STEM courses (Lowry and Thomas-Anderson, 2017; Carver et al., 2017). Hispanic students have a substantially lower participation rate in STEM Gateway courses (54%) compared to overall Hispanic student enrollment at SBCCD (61%). Additionally, Hispanic students are successfully completing STEM Gateway course at lower rates (60%) than other students (63%, Gamboa, 2018). Equally important, the percent of Hispanic students earning STEM awards (50%) is substantially and statistically significantly lower than the percent of Hispanic students attending SBCCD (59%, CHC IERP, 2018).

The state of current knowledge on factors influencing Hispanic student's decision to major and persist in STEM needs additional research. The Crisp and Nora's study commissioned by the Hispanic Association of Colleges and Universities, recommended research into all of the following: the socio-cultural variables influencing students' decisions to major and persist in STEM; the role of the community colleges in the STEM pipeline needs further evidence; the importance of the interactive effects of educational environments in student retention; the role of HSI's in improving access and retention (Crist & Nora, 2012). Each one of these considerations will be embedded in the research we will conduct.