Abstract

Through the First-Year Undergraduate STEM Experience (FUSE), CSUDH is expanding and integrating its support for STEM majors and therefore expects to improve retention of students. FUSE brings together STEM faculty with administration and key staff in student affairs. FUSE provides a holistic, immersive experience in STEM, beginning when students are recruited to STEM majors, and leading to an energized cohort of students who become integrated into the campus and persist into their second year on track for graduation into a STEM career. FUSE includes STEM 0, an introductory summer STEM experience, CS 0 and MAT X, intensive bridge courses designed to build students' preparation for their first college-level STEM course, Peer Leaders, who provide support and mentoring in the summer and through the year, community-building cohort events, and active learning in key gateway courses. FUSE builds on existing supports for students including Summer Bridge coupled with Early Start Math, the Louis Stokes Alliance for Minority Participation, new student and parent orientations, the Toro Learning Center, and a campus initiative to strengthen advising. Through FUSE, CSUDH believes that STEM students will gain a sense of belonging to the campus, an affinity for the STEM disciplines, and a mindset for success, and that they will become integrated into the campus and persist into their second year on track for graduation into a STEM career.

Core Elements

STEM Collaboratives Core Elements: Summer Bridge, First Year Cohort Experience, Course Redesign

Summer Bridge
- Students will participate in a series of four hands on workshops where they will explore academic and career options in different STEM disciplines.
- Bridge course (equivalent to 1 academic unit) in Computer Science or Mathematics – Students work with faculty and fellow STEM students to review critical skills and preview content for the upcoming semester.
- Students qualify if they need at most 1 developmental course, which they will complete in the summer.

First-Year Cohort Experience
- STEM course sections set aside for FUSE students
- Social events,
- Involvement as participants and volunteers in our on-campus STEM conference

Course Redesign
- Peer-Led Team Learning (PLTL) in key bottleneck STEM courses in Chemistry, Computer Science, and Mathematics
- PLTL provides in-class student assistants to support active learning
- PLTL leaders will also offer individual tutoring to students outside of class
- Precalculus curriculum redesign includes clicker-type questions, a problem-based curriculum, and standards-based grading

Current Activities

Advising
- Campus rolled out EAB dashboard
- Dedicated STEM advisors for GE advising
- Conversations happening among all advising groups on campus

Hiring of PLTL Leaders
- Materials for recruiting PLTL Leaders created
- Administrative Support (paperwork, etc) put in place
- Collaboration with campus tutoring services for office hours

Course Redesign
- Proposal submitted to CSU Course Redesign Program to rewrite Precalculus curriculum to include the following:
  - Problem-Based Curriculum (Precalculus by Collingwood, Prince, and Conroy) and locally developed materials
  - Clicker-type questions using Google Forms
  - Grit/growth mindset
  - Standards-based grading

Recruitment
- Admitted STEM students identified and targeted with a recruitment flyer and letter from CNBS Dean
- Students invited to meet us at Preview Day
- Website launched, including online application to the program

Next Steps
- Meet incoming STEM students at University Preview Day and College Open House
- Recruit, hire and train PLTL Leaders
- Plan FUSE Kickoff, STEM 0 and MATX/CSC0
- Train Advisors to suggest FUSE to incoming STEM Students

Participants

150 incoming STEM freshmen who need remediation in at most 1 subject

Acknowledgements

The CSUDH FUSE program is part of the CSU STEM Collaboratives Project which was created with funding from the Leona M. and Harry B. Helmsley Charitable Trust.

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