TEST: UP

Increasing the STEM Pipeline: Building Seamless Pathways to STEM Careers

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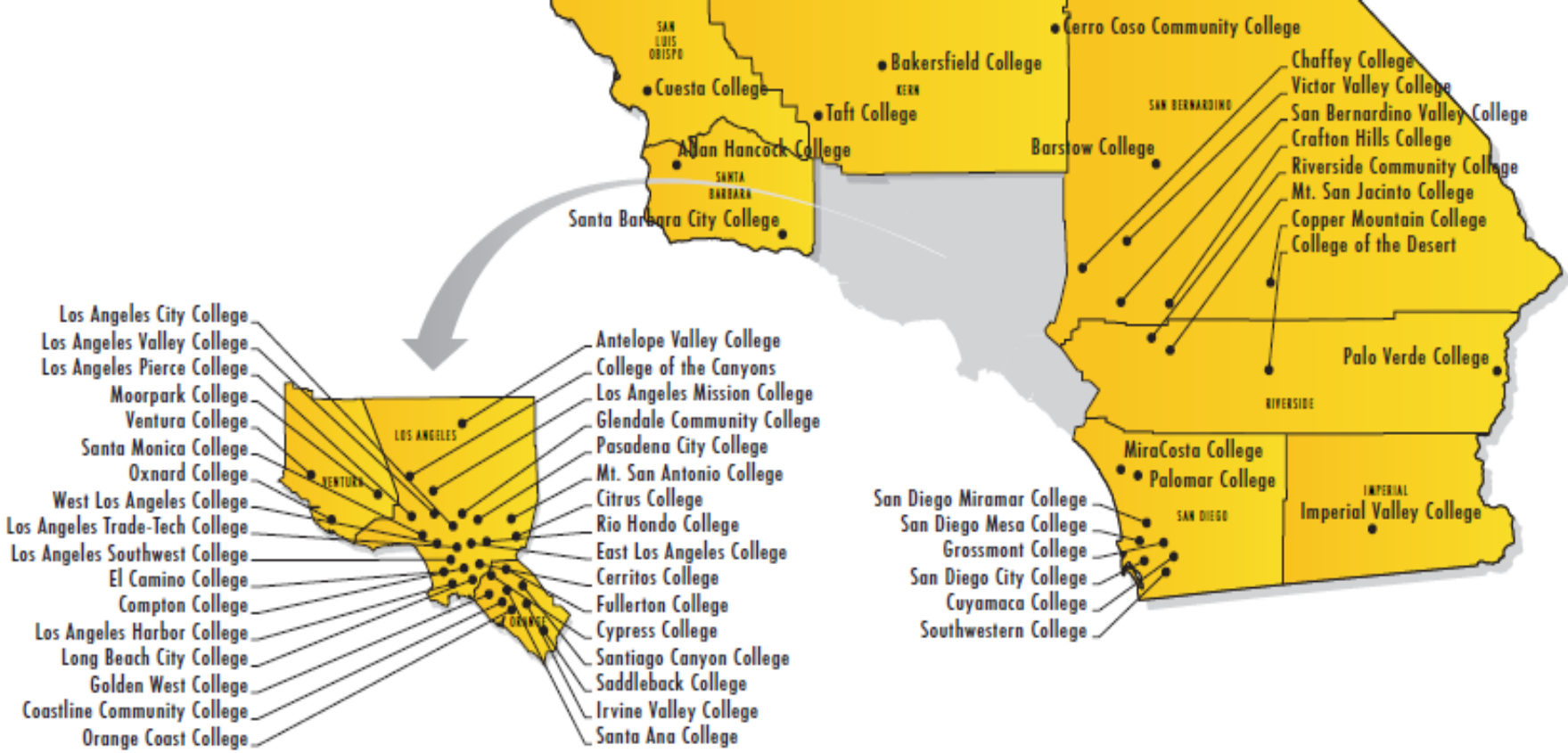
Agenda

- TEST:UP
- Identifying STEM Students
- Strategies to recruit and retain STEM students
- The transfer path for our STEM Transfers
- Transitional support for STEM students

The 23 Outstanding Campuses of the CSU



Chancellor's Office
California Community Colleges
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State of California

Issues facing STEM Transfer at the Community College

- Not aware of potential STEM Careers.
- Not aware of the requirements for general transfer or STEM specific transfer.
- Wrong courses taken or No articulation agreement.
- Lack of STEM community.
- Need for remediation.
- Expect to finish degree in 2 years.
- Ever changing transfer requirements.

TEST: UP

Program

- National Science Foundation - Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP):
  Total Award: $2,500,000 over Five Years
- Partnership between Cal State Fullerton, Mt SAC, & SAC.

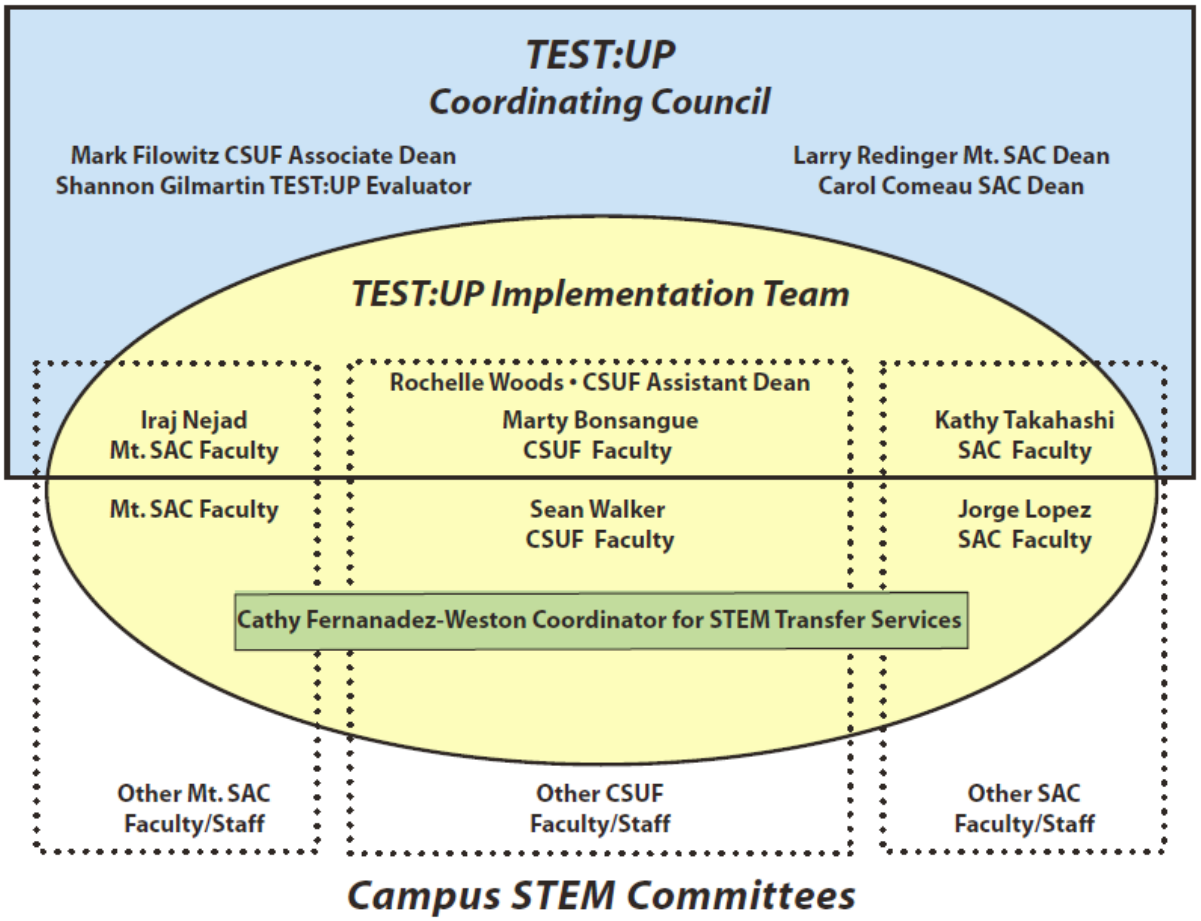
Overall Goals

- Increase the number of STEM transfers to four-year universities and colleges .
- Increase the number of STEM AA degrees and baccalaureates .

Focus

- Enhance STEM academic advisement and student engagement .
- Increase student success in entry-level mathematics and the science courses.
- Learn how to increase student success in entry-level mathematics and science courses via surveys and by appraising student preparedness from transcript analyses.
- Explore new tools to improve retention in the major-SI, EWS, Research Experience, etc.

Administrative Structure



Strategies and Programs

Strategy 1: Improve counseling, guidance and mentoring opportunities and improve information and knowledge of STEM careers for Mount San Antonio College and Santa Ana College STEM students and potential STEM students.

- Coordinator for STEM Transfer Student Services (Cal State Fullerton): Full-Time CSUF Position; Travel to partner colleges to provide advisement for STEM students, work with faculty and half-time counselors to implement study campaigns, assist with students at risk, and organize presentations and events .

- STEM Counselors/Advisors (Mount San Antonio College and Santa Ana College): Half Time Counselors/Advisers at each college; provide advisement for STEM students, work with faculty and CSUF Coordinator for STEM Transfer Student Services to implement study campaigns, assist students at risk, and organize presentations and events.

- Web Sites and Video Presentations (Mount San Antonio College and Santa Ana College): Improve web site information content and linkages to STEM academic programs, articulations with four-year institutions, events, career tracks, internships, and research opportunities.

Strategies and Programs

Strategy 2: Develop support networks, including facilities and programs to develop learning communities, for STEM students at Mount San Antonio College, Santa Ana College, and Cal State Fullerton.

- Peer Group Program for Transfers (Cal State Fullerton): Hiring of peer advisers as peer mentors to oversee learning communities made up of incoming CSUF transfer students majoring in mathematics, the sciences, and other STEM fields; special orientation and advisement events for these new CSUF transfer students

- Faculty Mentoring Programs (Mount San Antonio College and Santa Ana College): Mentoring of non-STEM majors with promise or interest in mathematics, the sciences, and STEM careers; visits to research labs, career days, professional seminar presentations

- Science Resource and Study Centers (Mount San Antonio College and Santa Ana College): development and improvement of science resource and study centers, including tutoring, access to specimens, books, maps, computer resources

Strategies and Programs

Strategy 3. Improve student engagement and learning in pivotal mathematics and science introductory discipline courses

- Development and Implementation of Supplementary Instruction (Academic Excellence) Workshops (Mount San Antonio College and Santa Ana College; Cal State Fullerton): implement Supplementary Instruction workshops associated with selected, key math and science courses using peer facilitators; work to establish a regional collaborative to provide a forum for discussing approaches and determine best practices that improve student success in these courses.

- Tutoring Programs (Mount San Antonio College and Santa Ana College): using peer tutors, expand tutoring programs and homework assistance in improved science resource and study centers; work with faculty, the Coordinator for STEM Transfer Student Services, and Counselors to encourage students to seek tutoring assistance.

Strategies and Programs

Strategy 4. Develop a teaching intern program to improve the pedagogical and mentoring skills of Cal State Fullerton math and science graduate students interested in community college teaching careers

- Teaching Intern Program (Cal State Fullerton, Mount San Antonio College, and Santa Ana College): place two Cal State graduate teaching interns each year with faculty mentors at both Mount San Antonio College and Santa Ana College where they will be hired as part-time faculty and given teaching assignments or serve as workshop facilitators; with additional funding, interns will spend time advising, counseling, and serving as mentors to students.

Identifying STEM Students

- Community Colleges do not require students to declare a major. “ Who are we serving?’
- Using STEM Track courses as our potential STEM population.
- Using STEM programs to grow STEM population
- Creating interest in STEM related fields through community education

TEST: UP in the Community College

- Campus wide collaboration with Deans, faculty, administrators, counselors, and students.
- STEM specific transfer counseling & advising.
- STEM Education and Outreach:
  - STEM Planning Committee
  - STEM Video series, STEM workshops, and STEM Clubs
  - STEM Week
  - STEM CSU Application workshops and fee waivers
  - Classroom presentations

TEST: UP in the Community College

- STEM Book Scholars program.
- Supplemental Instruction in STEM courses.
- Physical space for STEM related activities
- Field trips to local universities and Local STEM related business.

Book Scholarships

Requirements include:

- Book Scholarship Application
- STEM Major at the community college
- Meet with STEM Counselor 2 times a semester
- Identify undergraduate research opportunity
- Completion/and revision of student educational plan.
- Completion of STEM Resume
- Completion of cover letter
- Submission of Faculty recommendation letter

STEM Planning Committee

Contributors and participants include STEM Planning Committee, students, faculty, & staff.

Members include:

- STEM (TEST-UP)Counselor
- CSUF STEM (TEST-UP) Transfer Student Services Coordinator
- Biology Instructor
- MESA Director & Coordinator
- Center for Teacher Education Director & Coordinator
- Transfer Center Coordinator
- USDA Program Coordinator
- Off campus STEM community organizations
- STEM Alliance Co-Chair (Student Organization)

STEM Week

Activities include:

- STEM Career Panel
- STEM Student Panel
- STEM Video
- STEM resume workshop
- What to do with a Biology major workshop
- How to study for Math workshop
- STEM CSU Transfer Application Workshop
- STEM Student & Faculty Social
- STEM student group table and demonstrations
- Planetarium presentation
- STEM Fair (College representatives)

Supplemental Instruction in STEM courses

- Follow Kansas City Supplemental Instruction Model
- Offered in Biology, Chemistry, Physics and Math
- SI Leaders are successful STEM students
- We are seeing an increase in course completion for those students attending SI.
- Students are completing course with one grade higher than those that did not participate.

Physical Space for STEM Activities

- Creation of Biology Study Center
- Creation of TEST:UP Center
- Using outdoor space for STEM education
- SI leaders space for materials and supplies.

Increase in STEM Population

- TEST: UP Counseling has served 250+ students in STEM fields.
- 500+ Students have participated in STEM related events on campus.
- Over 1000+ students have been outreached to during class presentations.

CSU Transfer Process

- Have earned 60 or more transferable semester units.
- Completed Golden Four Requirements:
  - Oral Communication, Written Communication, Critical Thinking (CSU requirement) , and Mathematics/Quantitative Reasoning.
- GPA: based on the number of applications received and will not be determined until after the filing period.
  - Local GPA 2.5 vs. out of local Area GPA 2.7-3.7 in 2011.
- Good standing at the last college or university attended.
- Impacted campuses:
  - Departments can add additional requirements such as lower division core STEM classes (Calculus, Chemistry, Biology, etc.)
- Personal Statement (UC requirement)

UC = University of California system, 10 campuses
CSU = California State University system, 23 campuses

Transition Issues

- Wrong courses taken or No articulation agreement.
- Lack of Understanding of university policies:
  - Mandatory Advising
  - Satisfactory progress (i.e. Probation, Disqualification)
  - Course withdrawal policy
  - Repetition of course policy
- Lack of effective Study habits.
- Lack of experience with scholarly community.

STEM Transfer Student Services at Cal State Fullerton

- Outreaches to NSM and ECS transfer students only.
  - Target population of about 500+/- students per year.
  - Serves about 30% of these students per year.
- Services Offered:
  - Transfer Student Orientations
  - Peer Mentoring
  - NSM/ECS Early Warning System
  - STSS Book Scholarships
  - STSS Mini Grants

Transfer Student Orientations at Cal State Fullerton

- University Specific transfer student orientations.
  - Mandatory for all transfers in their first year.
  - Option of face-to-face at a cost of $60 full day/ $45 half day or online at not cost to the student.
- College specific transfer student orientation.
  - Mandatory face-to- face advising for all incoming transfers in NSM each semester.
  - Hold placed on student account
  - No cost to student

Peer Mentoring

- Peer Advisors:
  - STEM Majors- NSM and ECS only.
  - Transfers or successful juniors/seniors.
- Training:
  - On CSUF university , department policy and resources.
  - On mentoring relationships.
- Case load: An average of 100 students.
  - Only serve students their first year on campus.
  - Document every interaction with mentees.
- Learning communities.
  - Workshops.

NSM/ECS Early Warning System

- Electronic progress check system.
- Early Intervention- 3rd or 4th week in the semester.
- Incoming students only (Freshmen or Transfer).
- Faculty Feedback :
  - Quantitative- Grades or attendance
  - Qualitative- Comments
- Intervention:
  - Meeting w/ Coordinator
  - Specific and intentional intervention

STSS Book Scholarships

- Incoming NSM & ECS Transfer students only

  Requirements include:
  - STSS Scholarship Application
  - Peer advising (3 meetings)
  - STSS Involvement in workshops
  - STEM Student Organization participation
  - Full time enrollment and 2.5+ GPA
  - Essay and Resume

STSS Mini Grants

- STEM Transfer Student Services (STSS) Undergraduate Research Mini Grants opportunities was to enrich scholar's undergraduate experience at CSUF with the goal of improving retention in the major and enhancing student success
- Scholars were required to secure a faculty research mentor and work with them on a project over a period of one semester. As the research process differs by academic department, each STSS Scholar collaborated with his/her research mentor and the STSS coordinator to ensure a successful research plan and project.
- STSS scholars received a $200 book scholarship for participating in research with the faculty mentor. A project budget of $1,000 dollars was awarded to the faculty research mentor for working with the scholar. STSS Scholars attended at least one academic enrichment seminar each month and scholars also met twice a semester with the STSS coordinator to discuss progress on the project.
- Finally participants were required to submit an essay that summarized their experiences and lessons learned. Scholars and faculty mentors were also asked to complete an online survey requesting information about there experience in the program to evaluate the impact and effectiveness of the program.

Additional Projects

- Supplemental Instruction in STEM courses
- Cal State Fullerton NSM Transcript Analysis
- Pre Transfer Survey
- Post Transfer Survey

Lessons Learned

STEM students need to acquire vital skills needed to be successful:

- ✓ Time management
- ✓ Coursework load
- ✓ Studying 25-35 hours
- ✓ Seeking help (supplemental instruction, tutoring, study groups, etc).
- ✓ Seeking advisement
- ✓ Participating in undergraduate research opportunities

STEM students need to be informed early what to expect.

Lessons Learned

- Students must meet with college counselors/advisor/ representative as soon as possible to insure proper course selection and decreased time to degree completion and/or transfer process.
- Many transfer students avoid this process as they do not understand the value. University & Colleges must make an effort to inform students of the benefit of this process as many have not gone through this process before.
- Cost and time of these events are critical.

Lessons Learned

- Students are unaware & uninformed of STEM careers, therefore, they are not motivated to pursue a STEM degree.
- More exposure to STEM careers is needed especially with visual or hands on activities and demonstrations.

Lessons Learned

Community College Counselors and University Advisors need training and education on how to assist STEM students.

Questions?

Contact Us

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