

**E**      **G**      **C**  
**P**      **F**

The book *Breaking the Barriers: Helping Female and Minority Students Succeed in Mathematics and Sciences* highlights this MESA intersegmental model as a successful strategy to implement STEM education. Furthermore, the model has been named one of the most innovative programs in the nation by Innovations in American Government, a project of the Kennedy School of Government at Harvard University. It is also a winner of the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.

#### The Gavilan College Story as Evidence for Intersegmental Pathway Models

In the 2014-2015 academic year, 33% of TRIO's Summer Bridge Students were recruited and bridged from the local CalSOAP Program. All the students were first generation, low income Latinos. These students have been showing strong outcomes in their success at Gavilan College. For example, the 2014 Summer Bridge Cohort has the following outcomes:

- 78% persistence rate
- 68% are slated to Graduate and/or transfer within the next academic year (within 4 academic years). All of these students were underprepared Latinos. According to Gavilan College's scorecard, underprepared Latino student have about a 43% college completion rate within 6 years from a different cohort year. An exact comparison cannot be made with the scorecard given that it's a different cohort year, yet we offer the data for the sake of insight.
- After completing Summer Bridge, approximately 56 % tested 1-3 course levels above the level they initially tested into at the start of the program
- Students that first tested into Math 400-Arithmetic or Math 411-Integrated Pre-Algebra showed the most significant improvements, with about 71% of the students increasing 2 to 3 course levels above their initial assessment after completing Summer Bridge.

Student success can be seen from this pathway model. Another example is Mayra Clemente, a student from another TRIO Summer Bridge cohort. She was a CalSOAP student and transitioned into Gavilan College via TRIO's Summer Bridge. She later transferred to CSUMB where she graduated with her Bachelor's degree. She was recently hired as a Part-time Temporary Program Specialist for TRIO and MESA. She is currently applying for graduate school programs to earn an MSW.

While specific activities still need to be articulated with the grant writer. Activities in the grant will be centered but not limited to the following.

Implement a 6-week Summer STEM Academy which will simulate a college going experience that is at least 6 weeks in length. Include dual/concurrent enrollment in courses that may include the following courses.

- Mathematics through Pre-Calculus
- Laboratory Science
- Foreign Language
- Composition

- Literature

The STEM Academy would include STEM based competitions such as mouse trap race cars, Cardboard boat races, and or other similar team based STEM activities. Visits to four year universities and / or visits to industries such as Google, Cisco Systems, Facebook etc.

A Summer Bridge component will be implemented consisting of math and sciences related coursework for those students that have completed high school and are transitioning into Gavilan College during the following fall Term.

A Math Boot Camp Course will be offered along with Life Skills in Higher Education will be offered. Furthermore, additional activities will be implemented that include community building, transition into other educational support programs and personal/leadership development workshops. Collaboration will be made with STEM Grant Efforts.

- Academic tutoring will be provided in STEM based disciplines. Supplemental Instruction based on the Treisman model will be provided.
- Undergraduate STEM majors will serve as tutors and peer advisors for participants of the program.
  
- Advice and assistance will be provided in secondary and postsecondary course selection with an emphasis on a college pathway.
- Preparation and completion of college admission applications
- Preparation for College Entrance Examinations
  
- Information will be provided on Federal Pell Grants, Loan Forgiveness, Scholarships
- Assistance will be provided on the FASFA
-

- Personal and Career Development or other appropriate Non-Credit Coursework
- Hands on activities such as experience in laboratories, computer facilities or Field Sites. For example, the program can take advantage of the new outdoor classrooms and arboretum. Furthermore, visits can be made to location such as Elkhorn Slough sanctuary, visits to local Silicon Valley Companies, and/ or other similar locations.
- Guest Lecturers from mathematicians, scientist and/ or engineers who are engaged at Gavilan College or who engaged in research or applied science at public and private agencies.
- Provide students with a mentorship program that includes college students that are high achieving STEM majors and /or faculty, counselors.
- College student mentors will provide peer advisement, role modeling, and support.
- Exposure to cultural events will include activities such as plays, museum events, and cultural events at the local college or community.

Upward Bound is one of three TRIO Grants provided by the Department of Education. TRIO programs are a result of the Economic Opportunity Act of 1964 in response to the administration's War on Poverty. TRIO is one of the first equity oriented programs in the nation and has set a standard of best practices for providing culturally and socially relevant programming. For example, Garvin's 2015 Dissertation provided evidence to the culturally relevant nature of the Upward Bound Program. He stated,

“Findings suggest providing students the opportunity to “do” and learn science utilizing a culturally responsive approach was much more beneficial to their overall science knowledge, as it allowed students to experience, understand, and connect to and through their science learning. Likewise, culturally responsive science instruction helped students to foster a more positive interest in science and STEM careers as it provided students the opportunity to do science in a meaningful and relevant way. Moreover, results revealed students receiving culturally responsive science instruction were able to see themselves represented in the curriculum and recognized their own strengths; as a result, they were more validated and affirmed in and transformed by, their learning.” (Garvin, 2015,Vi)

TRIO Upward Bound, similar to TRIO Student Support Services, MESA, EOPS, and CalWorks, has a long history of being the best socially and culturally relevant practice. Each of these programs origin

required to be first generation and low income students with plans to attend college. It is required that the grant serve these equity populations.

We currently have an inequity in Asian access at Gavilan College but do not have any funds allocated to closing this gap. Special attention will be made to develop strategies to recruit students from Asian backgrounds. We will also follow up and expand with current efforts that targeted Asian community groups and faith-based organizations that were implemented to recruit for the TRIO Summer Bridge Program. We can explore developing a joint advisory group in creating a means for outreach.

The CalSOAP program currently serves low-income and first generation students. The CalSOAP program currently has a waiting list of students that it cannot serve. This waiting list can be used to recruit for Upward Bound.

Efforts will be made to collaborate with local Latino organizations that have youth based programs such as LULAC's Adelante Program and other similar programs.
