

East Campus Project Abstract

Pima County Community College, East Campus, has developed an HSI-STEM project that addresses identified needs of the Hispanic students we serve, as well as institutional gaps that make it challenging for Hispanic students to successfully complete degrees in STEM fields and transfer to four-year baccalaureate programs. Specifically, our HSI-STEM program: a) creates professional learning communities within STEM disciplines; b) updates the teaching modalities of eight courses in biology, chemistry, computer information systems, engineering, math, and physics (specifically BIO 181, CHM 151, CIS 129, CIS 131, ENG 102, MAT 189, MAT 220, and PHY 121) courses to include interdisciplinary teaching strategies that are infused with technology; c) renovates four spaces to facilitate 21st Century learning styles; d) includes outreach activities to encourage enrollment in STEM majors as well as an advising model to promote student success; and e) includes career modeling through relationships with the Tucson Hispanic Chamber of Commerce. When taken together, these activities will enable systemic change at PCC-East, ultimately serving to increase the number of Hispanic and other low-income students who transfer to four-year institutions. Our measurable objectives include:

- Objective 1: Strengthen student services (tutoring) to improve transfer rates by 25 percent by year 5 over the existing baseline of 0.5 percent of Hispanic students who transfer to four-year institutions from PCC-East Campus;
- Objective 2: Redesign eight STEM courses over a four-year period creating project based learning environments. Redesigned courses will improve retention rates (Fall to Fall) by 12 percent by the end of year five over a baseline of 2.8 percent; and
- Objective 3: By the end of year five, enrollment by Hispanic students into STEM majors will increase by 15 percent over a baseline of 8.4 percent

Articulation agreements established through the Arizona General Education Curriculum (AGEC-S) for science and math, will be reviewed creating specific pathways which will guide participants efficiently through course selection, graduation, and transfer to Arizona's public, four-year, institutions (Arizona State University, University of Arizona and Northern Arizona University).

Our HSI-STEM program was designed to address Competitive Preference Priority #2, using strategies that are based on research meeting the Moderate Evidence of Effectiveness standard of the What Works Clearinghouse. Specifically, we will use difference education, a strategy that draws on the personal narratives of successful Hispanic individuals engaged in STEM careers. This strategy has proven effective in increasing student achievement, particularly among minority populations. The citation is provided below:

Walton, G.M., & Cohen, G.L. (2011). "A question of belonging: Race, social fit, and achievement." Retrieved from: <http://tinyurl.com/jfj6rbs>

CFDA # 84.031C – *Valencia Title III HSI Reaching Rural STEM Students (R²S²)*

ABSTRACT

University of New Mexico-Valencia Campus

280 La Entrada

Los Lunas, NM 87031

Project Title: *Valencia Reaching Rural STEM Students (R²S²)*

The University of New Mexico-Valencia Campus (UNM-V), established as a branch campus in 1981, is a 2-year public college of the UNM system and functions as a regional community college for a large rural area in central New Mexico. During the 2014-15 academic year, UNM-V's enrollment was 2,077 students; 37% were STEM majors (63.9% Hispanic, 52% low-income, and 80.45% either Hispanic or low-income). The goals of the R²S² project are to: 1) increase the number, persistence, and success of full-time Hispanic and low-income (H/LI) students majoring in STEM degree programs; 2) increase the number of H/LI students graduating with a STEM associates or certificate; and 3) increase the number of H/LI students retained in STEM programs after transfer. All goals will be accomplished by implementing: expanded student support services (counseling, financial literacy/scholarship coaching, tutoring, and transfer services), a new Undergraduate Research Program, a new K-12/STEM Industry Outreach Program, new course and program data analytics, and establishing strong partnerships to improve post-transfer persistence with UNM Main Campus and New Mexico Institute of Mining and Technology. The R²S² Project is supported by moderate evidence of effectiveness from two studies: *Castleman, B. L., & Page, L. C. (2014). Freshman year financial aid nudges: An experiment to increase FAFSA renewal and college persistence.* Retrieved from: http://curry.virginia.edu/uploads/resourceLibrary/29_Freshman_Year_Financial_Aid_Nudges.pdf), and *Bettinger, E., Baker, R. (2011). The effects of student coaching in college: An Evaluation of a randomized experiment in student mentoring.* Retrieved from: <http://www.nber.org/papers/w16881>.

ABSTRACT

Applicant: Dewey University-Carolina; 11170 Ave. 65 de Infantería, Carolina, PR 00968

Proposed Project: *Inspiring Hispanic Students through STEM Opportunities*

Institution / Target Area / Population Served: Dewey University is a private, nonprofit, Hispanic-Serving Institution located in Puerto Rico. The Carolina campus (DU-Carolina or DU-C) provides educational opportunities for students in the northeast region of Puerto Rico, (primarily economically disadvantaged). DU-Carolina's enrollment (1,010 students, Fall 2015) is 100% Hispanic, 100% Pell grant eligible (low-income), average age of 25, and 62% of students work (FT or PT). About 81% of DU-C students are enrolled in evening and/or weekend courses, which reflects our high proportion of working adults. Six municipalities surrounding our campus (total population of 452,276) make up our service area, which is economically distressed: 30% to 48% of residents live in poverty (compared to U.S. poverty rate of 15.6%) and the median household income ranges from \$18,456 to \$30,687.

Project Activities and Services: DU-Carolina proposes the following activities and services:

- (1) Establish Robust Academic Support System – These student-centered services will infuse support strategies associated with persistence and success (tutoring, coaching/advising, English skills training, and a bridge program for junior/senior high school students).
- (2) Develop New Academic Programs – Two new STEM academic options (IT-Programming and Electro-Mechanical Systems Technology) will create new STEM pathways.
- (3) Enhance STEM Instructional Facilities – This infrastructure improvement will support the new programs, while providing dynamic learning opportunities with modern equipment.
- (4) Develop Hybrid Credit-Bearing Curricula – Making STEM courses available in hybrid format will expand access to STEM curricula for Hispanic, low-income students.
- (5) Customize IT Curricula – Embedding IT courses with appropriate pedagogy/materials to prepare students for IT certification exams will enhance STEM employability skills.
- (6) Develop Transfer Partnerships – Developing partnerships with 2-year HSIs (Trinity College of PR and Instituto Tecnológico de PR-Manati campus) will result in a replicable model of a transfer and articulation agreement.

Goals and Expected Outcomes: The project's overarching goals are to **increase**: enrollment and program completion in STEM fields, transfer enrollment/success for STEM majors, and student success and persistence in STEM programs. Five-year outcomes related to those goals are: increased enrollment of STEM students (+125); increased annual enrollment of STEM transfer students (+25); increased overall retention rate (+8 perc. pts.); and increased STEM degrees awarded (+60).

Absolute Priorities and Competitive Preference Priority: The proposed project responds to Absolute Priority 1, Absolute Priority 2, and also to Competitive Preference Priority 2 (supported by evidence of effectiveness that meets the definition of “moderate evidence of effectiveness”).

The citation of the study used to support the evidence requirement:

Bettinger, E.P., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring. http://cepa.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

Year 1 Budget Request: DU-C requests \$997,059 for Year 1 of this HSI STEM and Articulation Program, the first HSI STEM application ever undertaken by Dewey University-Carolina.

Mission College (MC) is one of two, 2-year colleges in the West Valley-Mission Community College District. The college is located in the heart of the high tech industry in Silicon Valley, but job opportunities have been severely limited for its Hispanic and low-income students who come from the diverse surrounding neighborhoods characterized by poverty, high HS school dropout rates, and a low-skilled workforce. As a newly recognized Hispanic-serving institution, the college is challenged to provide much needed services for a rapidly growing Hispanic student population. In fall, 2015, Mission enrolled 8,607 students, one fourth of whom were Hispanic and nearly one-third of whom were identified as low-socioeconomic.

Proposed Project: *STEMlink* provides a blueprint for increasing the number of Hispanic and low-income students attaining STEM degrees. Proposed project services include: **I. Linkages to create seamless STEM pathways:** HS visitations/workshops and information sessions for students and parents, identification and follow up with HS students, MC College tours, development of articulated STEM pathways from high school to MC; summer STEM camp; STEM events. Transfer Alliance with CSU East Bay/development of articulated STEM pathways to university, University Peer Mentors, University orientation **II. Strengthening Student Support Services** STEM Career Roadmaps, STEM Career Fair, STEM Counselor/STEM Completion Coach, Peer Navigators, Financial Aid workshops and text message reminders to complete FAFSA **III. Strengthen Academic and Learning Support Services,** New math lab/math tutors, acceleration of developmental math sequence; curricular review; evidence-based instructional strategies; required Supplemental Instruction, 4 faculty learning communities: Embedding Research in the Science Curriculum. Culturally Relevant Teaching and Learning Strategies; Getting to know our Hispanic Students; Math Faculty Learning Community **IV. Linking Hispanic and low-income students to industry.** Job Shadowing, e-mentoring, 14th year internships, Summer research projects **WWC research:** Required Supplemental Instruction in Pre-calculus and General Chemistry.

University Partnership MC and California State University East Bay (CSU East Bay) continue to forge a strong partnership focused on successful student transfer and increasing Hispanic STEM transfer rates. Through the creation of a Transfer Alliance they will bring students, parents, transfer counselors and staff, and faculty together to strengthen the transfer process and create opportunities for university/community college faculty communication.

Strong management, evaluation and research components reinforce likelihood for success.

Competitive Preference Priority: A study that utilized two-way text messaging to increase FAFSA renewal and college persistence of first-year students through their sophomore year was used as the basis for the similar practice proposed in this project. *This study meets the WWC threshold for moderate level of effectiveness without reservation.*

Selected Study and Link: Castleman, B. L., & Page, L. C. (2014). *Freshman year financial aid nudges: An experiment to increase FAFSA renewal and college persistence* (EdPolicyWorks Working Paper Series No. 29). Charlottesville, VA: EdPolicyWorks

http://curry.virginia.edu/uploads/resourceLibrary/29_Freshman_Year_Financial_Aid_Nudges.pdf

Project Abstract

California State University Channel Islands (CI) is the newest of the California State University system campuses (established in 2002) and the only public four-year university in Ventura County (VC). The CI mission emphasizes placing students at the center of their educational experience. CI proposes to implement **Project PROMESAS (Pathways with Regional Outreach and Mathematics Excellence for Student Achievement in STEM)** to *strengthen* the STEM student success pipeline and *transform* collegiate mathematics pathways for retention and success. Hispanic students in the service region are fully 57% of the K-12 public school population; only 14% of these students are deemed college-math-ready as they approach high school's end. For those who attend CI, pass rates in both developmental math and STEM math courses are low, with correspondingly high rates of leaving STEM majors or leaving college altogether. Project PROMESAS will 1) transform pathways into and through STEM mathematics at CI and its partner community colleges, and 2) partner regionally to develop a K-12 and transfer college readiness initiative and enhanced student-centered academic support services. Project PROMESAS will result in substantially changed practices, systems, and policies to increase the number of Hispanic and low-income students who enroll in college and successfully complete a STEM major, refine student-centered academic support services to help students succeed academically in core STEM courses, graduate more students with degrees in STEM fields, and improve the articulation of STEM courses with our 2-year college partners (thus meeting both Absolute Priorities). Multiple aspects of the strengthened STEM pipeline intervention are supported by strong theory and research studies meeting the moderate evidence of effectiveness standard. Within the 5-year project timeline, **improved STEM student success outcomes** include increased student retention, improved progression rates, and improved 3-year and 6-year graduation rates for transfer students and freshmen, respectively, with a focus on Hispanic and low-income students. As part of this application, **we request consideration for Competitive Preference Priority #2 (CPP, 3 points) based on statistically significant and positive impact of peer-to-peer academic coaching on the retention rates and academic performance of college students.** One of the studies (Bettinger, 2014) used to inform our proposed peer-to-peer academic coaching program in Activity 2 has already been found to meet the Moderate Evidence of Effectiveness by the What Works Clearinghouse and, thus, **meets the requirements for CPP #2.** The other study (Franklin, 2012) is also submitted for consideration for CPP #2.

Bettinger, E. & B. Baker, R. (2013) *The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring*, **Educational Evaluation and Policy Analysis**, March 2014; vol. 36, 1: pp. 3-19, first published on September 18, 2013. <http://www.insidetrack.com/wp-content/uploads/2014/09/aera-educational-evaluation-policy-analysis.pdf>

Org. Address:

CSU Channel Islands
1 University Drive, Camarillo, CA 93012

Franklin, J. & Franklin, A. (2012) *The long-term independently assessed benefits of coaching: A controlled 18-month follow-up study of two methods*, **International Coaching Psychology Review**, Vol. 7, No. 1, March 2012, Pages 33 – 38. <http://tinyurl.com/zrwbtvf>

ABSTRACT

Overview. Arizona Western College’s (AWC) *Informatics – STEMing Into New Careers for Today and Tomorrow (INSTINCT2)* Project is an innovative endeavor to offer a *geographically isolated population of Hispanic and low-income students* a synergistic network of evidence-based student services while establishing a level playing field through the provision of curriculum development and design enhancement in order to provide innovative courses that utilize the latest technology and teach through *hands-on, real-world experiences* that allow students to make connections between courses, disciplines, technology and the larger world.

INSTINCT2 will provide customized outreach/advising activities designed to augment existing systems; student supports to increase cohort retention/graduation rates; state-of-the-art facilities and equipment that provide student opportunities to gain competitive skills; and working with independent researcher Stephanie Reeves, under the mentorship of Dr. Walton, conduct a social belonging intervention randomized control trial targeting developmental math courses.

AWC, in cooperation with the University of Arizona South (UAS) - a Hispanic-Serving Institution, will establish the first locally available STEM-designated Computer and Information Science (CIS) pathway in Yuma and La Paz Counties..

Target Area. Yuma, La Paz, Pima, and Cochise Counties. Congressional Districts AZ: 2, 3, & 4.

Competitive Preference Priority 2 Citation. Walton, G. & Cohen, G. 2011). A brief social-belonging intervention improves academic and health outcomes of minority students. Science, 331, 1447-1451.

http://web.stanford.edu/~gwalton/home/Publications_files/Walton_Cohen_2011_Science_1.pdf

Project Goals and Expected Outcomes.
GOAL 1: Increase Associate & Baccalaureate degree completions among Hispanic & other low-income students in STEM-related fields by strengthening Informatics program infrastructure & curriculum.
<ul style="list-style-type: none"> ▪ By the end of year 5 (Y5), target population (TP) full-time Computer and Information Sciences (CIS) degree-seeking undergraduate enrollment will be ≥163% (40) over the baseline year. ▪ By start of Y5, 70% of AWC TP first-time full-time (1TFT) STEM CIS degree-seeking undergrads who were in their 1st year of postsecondary enrollment in the previous fall & are enrolled in the current fall in a STEM degree/credential program. <i>Baseline: 52%; Benchmarks: Y3 60% & Y4 65%</i> ▪ By Y4 end, ≥40% of TP 1TFT CIS degree-seeking undergraduates will attain a STEM degree/ credential within 3 years of enrollment. <i>Project Baseline: 18%; Benchmarks: Y3 24% & Y4 32%</i> ▪ By Y5 end, 3,936 TP students participated in n INSTINCT2 student support programs or services. <i>Benchmarks: Y2 1,184, Y3 1,184, Y4 784, Y5 784</i> ▪ By Y5 end, 80% of TP students who participated in INSTINCT2 services or programs who successfully completed gateway courses. <i>Baseline: 68%; Benchmarks: Y2 72%, Y3 75%, & Y4 78%</i> ▪ By Y5, 75% of TP students who participated in INSTINCT2 services or programs in good academic standing. <i>Baseline: 63%; Benchmarks: Y2 66%, Y3 69%, & Y4 72%</i> ▪ By Y5 end, 40% of TP students who participated in INSTINCT2 services or programs & completed a degree or credential. <i>Baseline: 10%; Benchmarks: Y3 20%, & Y4 30%</i>
GOAL 2: Increase # & % of target students transferring to 4-year institutions in STEM-related fields through development of model transfer/articulation agreement programs with UAS
<ul style="list-style-type: none"> ▪ By Y5 end, ≥40% Hispanic & low-income students attending AWC & successfully retained in the CIS field transferred to a 4-year institution. <i>Baseline: 10%; Y3 20%, & Y4 30%</i> ▪ By Y5, 53% of Hispanic & low-income CIS transfer students are on track to completing a STEM field degree within three years from their transfer date. <i>Baseline: 33%; Benchmarks: Y4 43%</i>

Project Abstract

<p><u>Project Director:</u> Dr. Hossein Rahemi; <u>Phone:</u> (718)429-6600; <u>Email:</u> hossein.rahemi@vaughn.edu; <u>Address:</u> 86-01 23rd Avenue, Flushing, NY 11369</p>
<p><u>Project Title:</u> Developing Guided Articulated Completion Pathways in Leading Edge Aeronautics and Aviation Careers for Hispanic and Low-Income Students</p>
<p><u>2-year HSI Articulation Partner:</u> Bergen Community College (28% Hispanic)</p>
<p><u>Target Area:</u> Increase the number of Hispanic and low-income students who have access to and complete articulated STEM-related degree and career opportunities in a service area that is one of the most diverse in the nation, where poverty is high, and educational attainment is low.</p>
<p><u>Goals:</u> G1: Close <u>academic achievement</u> gaps where students are at high risk of failure or withdrawal, including increasing the percent of Hispanic and low-income students who participated in grant-supported services or programs and who successfully complete gateway courses (<i>GPRA 7</i>), and increasing the percent of Hispanic and low-income students who participated in grant-supported services or programs and who are in good academic standing (<i>GPRA 8</i>); G2: Expand focus on <u>persistence</u> to include the development or redesign of instructional programs and support strategies that facilitate Hispanic and low-income student transition through upper division studies in high demand STEM fields (<i>GPRA 6</i>). G3: Strengthen <u>college capacity</u> for offering opportunity equity for all students through stronger outreach to high school and community college students. <u>Objectives:</u> O1: Increase by 10% the number of Hispanic and low-income full-time STEM degree-seeking undergraduate students enrolled; O2: Increase by 10 points the percentage of Hispanic and low-income first-time, full-time STEM field degree-seeking undergraduate students who were in their first year of postsecondary enrollment in the previous year and are enrolled in the current year who remain in a STEM degree/ credential program; O3: Increase by 10 points the percentage of Hispanic and low-income first-time, full-time degree-seeking undergraduate students graduating within six years of enrollment with a STEM degree; O4: Increase by 10 points the percentage of Hispanic and low-income first-time, full-time degree-seeking undergraduate students graduating within three years of enrollment with a STEM field degree/credential at HSI BCC; O5: Increase to 15% the percentage of Hispanic and low-income BCC associate degree graduates transferring to Vaughn in a STEM major; O6: Increase by 10 points the percentage of Hispanic and low-income STEM major transfer students from BCC on track to complete a STEM degree within three years from their transfer date; O7: Increase by 10 points the percentage of Hispanic and low-income students who participated in grant-supported services or programs and completed a degree or credential.</p>
<p><u>Strategies/Outputs:</u> S1: Outreach & Articulation: (a.) Formal articulation agreement with BCC (and SCCC); (b.) Formal outreach program with high school and community college students (including Pathways to Higher Education program in Queens). S2: New & Enhanced STEM Degree Programs: (a.) Stackable Curriculum/ Degree Pathways (including new Aeronautics Manufacturing and UAS Operations BS Degree Programs). S3: Re-envisioned Support Services: (a.) Guided pathway intrusive advising.</p>
<p>Project Addresses CPP # 2 by modeling project design on the following study providing moderate evidence of effectiveness: Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). <i>Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students</i>, New York: MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf.</p>

The Colorado State University-Pueblo's Communities to Build Active STEM

Engagement (C-BASE) Program integrates **curricular** (new and redesigned coursework), **co-curricular** (undergraduate research opportunities, mentorship, student services), and **programmatic** (professional development, community building, and seminar series) transformation to achieve our primary goals of **1)** creating student centered services (tutoring, counseling, and student service programs) designed to improve academic success, including innovative and customized instruction courses designed to help retain students and move the students rapidly through core courses and program completion, **2)** increasing the number of Hispanic and other low income students attaining degrees in STEM fields, and **3)** developing a model transfer and articulation agreement between Pueblo Community College (PCC) and CSU-Pueblo in STEM degree fields.

We have designed four major programs/activities to achieve our primary goals above, including; **1) Building Research Communities, 2) Creating a STEM Learning Center, 3) Developing a STEM Center for Engagement and Education, and 4) Redesigning STEM Curriculum** (*Competitive Preference Priority 2 – Modeled after Lovett, Meyer, and Thille (2008) – met WWC study design standards without reservations*).

The expected outcomes/performance measures of the C-BASE program at year 5 for Hispanic and Low Income students in STEM fields are; 1) a 10% increase in the number of students, 2) a 10% increase in the percentage remaining, 3) a 25% increase in the 6 year graduation rate, 4) a 100% increase in the number of students participating in grant funded activities, 5) a 56% increase in the percentage of students who complete gateway courses, 6) a 57% increase in the percentage that remain in good standing, 7) a 20% increase in the percent of transfer student s on track to completion , and 8) a 25% increase in degree completion.

TITLE: CHAFFEY COLLEGE TITLE III HSI STEM AND ARTICULATION PROJECT

Project Goals: 1) More first-time, no prior college experience students (especially Hispanic, low-income, high need students) will access student and non-instructional support services; 2) Increase opportunities to incorporate effective contextualized teaching/learning and instructional support strategies; 3) More Hispanic and underrepresented students will participate in STEM transfer services; 4) More first-time, no prior college experience Hispanic and underrepresented students will enroll in and successfully complete STEM courses and persist in STEM-related programs; 5) More Hispanic and underrepresented students will attain 2 year STEM related degrees, become transfer-prepared; and 6) Increase professional development training opportunities for inter-segmental faculty that address alternative STEM teaching/learning strategies documented as promising practices to improve success.

Long Term Outcomes: • Reduce degree and certificate time-to-goal completion; • Reduce time-to-transfer from initial Chaffey College enrollment; • Increase the number of students who are transfer-prepared; • Increase transfer rates to four-year postsecondary educational institutions; • Increase the number of students who are able to access transfer level STEM courses; • Increase the # of students who become transfer directed (successfully complete a transfer level STEM course); • Increase the overall % of STEM courses offered; • Increase in faculty incorporating PLO strategies. ** See page 25-26 of Application for additional Short and Medium-Term Outcomes.

Population to be served: Chaffey College is a large two-year, public institution located in the county of San Bernardino and city of Rancho Cucamonga, 40 miles east of Los Angeles, California. In the 2015-15 academic year, 28,262 unduplicated students enrolled in courses throughout the District. Chaffey serves a diverse, historically underrepresented student population. Over 83% of the student population are students of color, including: 62.2% who are Hispanic; 9.8% who are African American; 8.2% who are Asian/Pacific Islander; and 3.1% who are multi-ethnic. The project will serve a minimum of 14,700 STEM students over five years.

Articulation and transfer partners: CalPoly Pomona, CSU, San Bernardino and UC Riverside

Competitive Preference Priority #2 “moderate evidence of effectiveness”: This proposal is based upon well-researched effective practices that point to the relationship between individualized counseling and student success and is clearly articulated in the article, *The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring* (Bettinger, E.P., & Baker, R. (2011). The complete study can be found at: https://cepa.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

Project Abstract - Pasadena City College

Address: 1570 E. Colorado Blvd., Pasadena, California 91106
Project Director: Dr. Brock Klein: (626) 585-3049; Email: bmklein@pasadena.edu
Project Title: PCC's STEM GPS (Guided Pathway Solution) for Equitable Success and Degree Completion for Hispanic Students
Articulation Partner: California State University, Los Angeles (also an HSI)
Target Area to be Served: Improving student outcomes for Hispanic and low-income students by developing a STEM Meta-Major and pathway to degree completion at PCC.
Outcomes: By Sept. 30, 2021 the project will: 1. Enrollment: increase the percentage of Hispanic and low-income full-time STEM field degree-seeking students by 12 points over the 2016-2017 baseline; 2. Participation: at least 750 Hispanic and low-income students will have participated in grant-funded student support programs or services; 3. Gateway Success: increase the percentage of Hispanic and low-income students in the STEM Pathway who successfully complete Math 7A or Chemistry 1A by 10 points over the 2016-2017 baseline; 4. Persistence: increase the percentage of Hispanic and low-income first-time, full-time degree-seeking students who were in their first year of postsecondary enrollment in the previous year and remain enrolled in the STEM Pathway the following year by 10 points over the 2016-2017 baseline; 5. 30 Unit Milestone: increase the percentage of Hispanic and low-income students in the STEM Pathway who complete 30 transfer-level units within 2 years by 8 points over the 2016-2017 baseline; 6. Transfer: increase the percentage of Hispanic and low-income students in STEM Pathway who transfer successfully to a four-year institution in a STEM field by 8 points over the 2016-2017 baseline; 7. Pathway Completion: increase the percentage of Hispanic and low-income students in STEM Pathway who have completed a degree or credential by 8 points over the 2016-2017 baseline; 8. Overall Completion: increase the percentage of Hispanic and low-income first-time, full-time degree-seeking students graduating within three years of enrollment with a STEM degree/credential by 4 points over the 2016-2017 baseline; 9. Equity Measures: reduce any equity gaps between Hispanic and general population students that exist in the above measures from 2016-17 baselines by at least 50%.
Services to be provided and Activities to be conducted
Outreach: mobile STEM lab, student/family workshops, dual enrollment; data sharing with local high schools. STEM GPS: STEM Meta-Major with mapped guided pathway; contextualized courses, SI, co-requisite acceleration, research/experiential opportunities and summer bridge. Pathway Supports: Using PCC's Pathways program and CUNY's ASAP as holistic models proven to increase success of underprepared students, create a STEM Success Team with counselors, advisors, peer coaches, tutors. Incentives include priority registration and lender library. Transfer: 2 nd level articulation to fully align program outcomes and services; interactive transfer website and transfer app. Faculty Development: Equity-minded pedagogy; PBL; curriculum development.
Citation/s and links of the studies used to support the CPP #2 evidence requirement: Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). <i>Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students</i> , New York: MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf . Hayward, C. & Willet, T. (2014). <i>Curricular Redesign and Gatekeeper Completion: A Multi-College Evaluation of the California Acceleration Project</i> . http://cap.3csn.org/files/2014/04/RP-Evaluation-CAP.pdf

Title III Part F HSI STEM and Articulation Grant

Oxnard College/VCCCD

EMBRACING STEM COMPLETION: Project Acabado Abstract

The design of *Project Acabado* includes a “Promise Pathway” with a shared-interconnected continuum of services from K-12 to 2-year to 4-year institutions that incorporates high impact student-centered STEM pipeline support-services/activities and intrusive/transfer counseling supported by a signed agreement outlining these collaborative initiatives between Oxnard College, California State University Channel Islands, California Lutheran University, the Ventura County Office of Education and the City of Oxnard.

In addition, it includes cascading peer mentoring; STEM tutoring; creation of Resiliency Circles; summer bridge programs (under-graduate research and STEM booster); student and parent educational workshops, creation of an Entrepreneur-STEM (E-STEM) degree pathway; creation of minor in STEM education leading to a K-8 teaching certificate and; supports STEM faculty/teacher development programs “Festival of Scholars and Summative Conference” allowing STEM faculty and teachers throughout the Region to share and align support services, class experiences and high impact teaching practices to prepare better STEM students for transfer and graduation at all levels of the P-20 pipeline.

The activity selected to meet the “Moderate Evidence of Effectiveness” competitive preference priority is the Cascading Peer Mentoring program. The study that meets the What Works Clearinghouse Evidence Standards with and without reservations is “*The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring*” Eric Bettinger & Rachel Baker 2011 (<http://www.nber.org/papers/w16881.pdf>)

Contact Information:

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ABSTRACT

Institution and target area: Cabrillo College (Cabrillo) is a public, comprehensive, two-year Hispanic-Serving Institution with a main campus in Aptos, CA (pop. 5,743) in Santa Cruz County (pop. 271,804). Agriculture is the economic linchpin of the 607 square mile service area, with excellent career opportunities in STEM fields such as sustainable agriculture and environmental engineering. Initiatives to improve environmental sustainability across the region and state have brought changes in these and other STEM fields leading to high-demand “green” careers. Disadvantaged service area residents – particularly Latinos (42% of service area residents), thousands of whom rely on low-pay agricultural jobs – need access to these STEM pathways, as well as support to persist through STEM associate degree completion and baccalaureate transfer.

Offering more than 70 associate degrees leading to baccalaureate transfer as well as Career and Technical (CTE) programs, Cabrillo serves a predominantly disadvantaged population. Of the 13,393 students (39% Latino) enrolled at Cabrillo in Fall 2015, 58% were low income (75% among Latinos) and 44% were the first in their families to attend college (62% among Latinos). Of STEM students surveyed in Fall 2015, 59% had no parent with a college degree (78% among Latinos).

Proposed project, services, and activities: We propose *Sustainability in STEM*, a five-year HSI STEM and Articulation project addressing the goals of increasing access to and baccalaureate transfer in high-demand STEM fields. Activities and services include the following:

- (1) Develop/revise/pilot key STEM curricula (63 credit hours) to infuse sustainability content and resources. New/revised curricula will be transferable to sustainability-related STEM programs at California State University (CSU) and University of California (UC) institutions and will allow establishment of new associate degrees in Sustainable Agricultural Technology and Environmental Sciences, as well as a new Certificate in Sustainability.
- (2) Develop/pilot student-centered services, including peer assistance for instructionally-infused research, laboratory, and service learning activities; STEM advising, and STEM coaching.
- (3) Develop curricula-specific transfer/articulation agreements with California Polytechnic State University-San Luis Obispo (Cal Poly SLO), University of California (UC) Davis, California State University (CSU) Monterey Bay, UC Santa Cruz, and San Jose State University.

Five-year outcomes include increased STEM enrollment (+300, +200 Latino/low income), increased STEM associate degree completion (to min. 138 annually, 35% [48] Latino), and increased STEM transfer (+228 annually, 35% [80] Latino). The project addresses both Absolute Priorities and Competitive Preference Priority 2, with coaching incorporating strategies meeting the USDE’s definition of moderate evidence of effectiveness. Citations appear below:

- Bettinger, E.P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring.* http://cepa.stanford.edu/sites/default/files/bettinger_baker_030711.pdf
- Castleman, B. & Page, L. (2014). *Freshman year financial aid nudges: An experiment to increase FAFSA renewal and college persistence.* http://curry.virginia.edu/uploads/resourceLibrary/29_Freshman_Year_Financial_Aid_Nudges.pdf

Year 1 Budget Request: \$1,096,785

ABSTRACT

HSI-STEM and Articulation Program- CFDA 84.031C **El Centro College (2-year HSI), 801 Main St., Dallas, TX, 75202**

El Centro College (ECC) is one of seven two-year colleges in the Dallas County Community College District. In fall 2015, ECC enrolled 10,959 credit students and 6,453 continuing education, Adult Education, and English as a Second Language students. Eighty-nine percent of ECC's students are first generation college students and over 64% of those are Hispanic. The service area's general characteristics include high unemployment and poverty, High School drop-out rates, low-skilled workforce, high crime rates, and less economic development and services.

Proposed Project: *Innovative Pathways to STEM Success (IPSS)*, integrates student services and transfer/articulation pathways that converge to support an increase in Hispanic and low-income students attaining STEM degrees. The activities proposed include: A) new STEM courses, programs and pathways – including an innovative Urban Agriculture and Renewable Resources program; B) a pipeline for STEM enrollment, math success and transfer from High School to University – focuses include math strategies, a joint Evidence-Based Innovation Consortia (EBIC) with UNTD for faculty development, and new articulations for transfer; C) Enhancements in STEM student learning including learning communities/cohorts and mentoring; and D) Strengthening of STEM advisement/counseling and creation of a STEM Ambassadors Honors Program.

Through these activities, the ECC IPSS project aims to increase enrollment and persistence of Hispanic STEM students, while enriching the learning experience of all students pursuing STEM degrees at El Centro College – the vast majority of whom are low-income. The planned activities meet both of the required Absolute Priorities.

University Partnerships for the articulation and transfer model are: U. of North Texas-Dallas, U. of Texas-Arlington, Texas Tech U., Texas Southern U., Texas A&M U.-Commerce, Texas State U., Texas A&M, and Tarleton State U. The partnership with U. of North Texas-Dallas include: the creation of a 2+2 program in Urban Agriculture and Renewable Resources; enhanced cross-institutional student services including jointly administered learning communities, peer mentorships, and shared advisors; EBIC for faculty development.

Strong management, evaluation and research components reinforce likelihood for success.

Competitive Preference Priority: A study of learning communities at Kingsborough Community College serves as the basis for the cohort model proposed in this project. The study meets the WWC threshold for moderate level of effectiveness without reservation.

The Study: Sommo, C., Mayer, A., Rudd, T., & Cullinan, D. (2012, July 1). *Commencement day: Six-year effects of a freshman learning community at Kingsborough Community College.*

The Link: <http://www.mdrc.org/sites/default/files/Commencement%20Day%20FR.pdf>

IMPACTing STEM Success at Texas State University (IMPACT)

Texas State University. Founded in 1903, Texas State University is located in San Marcos, a community located between Austin and San Antonio and on the edge of the Texas Hill Country. Its eight undergraduate colleges offer its diverse student population opportunities to choose from 97 bachelor's degree programs. In addition, the university offers 89 masters and nine doctoral degree programs. Recent recognitions for the university include being ranked 16th in the nation for the number of bachelor's degrees awarded to and 42nd in total enrollment of Hispanic students (among 2- and 4- year institutions) by Hispanic Outlook magazine.

Activity 1. Enhancing and developing the STEM success pipeline through high-impact practices and outreach. To improve Hispanic and low-income STEM success, high-impact services will be provided to new freshmen and transfer students and continuing students in STEM baccalaureate programs. Academic advising, peer mentoring, academic coaching, peer-led team learning, and undergraduate research will be provided to students with the goal of improved academic achievement, retention, and graduation rates. A data-driven process identifying STEM students at risk of attrition will be implemented for all Hispanic and low-income STEM students with the goal of promoting academic recovery. Finally, we will improve and expand the STEM pipeline with community colleges through communication, information exchange, Transfer Planning Guides, and timely articulation of credits upon matriculation to the university. Prospective STEM students from Texas community colleges will be welcomed to campus through an innovative STEM Insight Visit Day experience.

Activity 2. Strengthening STEM success through professional development and research. A professional development program will be implemented that strengthens faculty and staff abilities to serve as mentors for undergraduate STEM research and prepares students for a research immersion activity as research mentees. A more culturally fluent faculty and staff will be developed with the goal of enhancing the increasingly diverse STEM student experience. Finally, a community of scholars will be engaged with the goal for developing individual and collaborative research teams and programs on Hispanic and low-income STEM success, specifically, and the overall success of Hispanic and low-income students, more generally.

Outcomes. By September 2021, project evaluation will assess achievement of the following IMPACT goals for students, faculty, and staff: Academic achievement; persistence to the degree completion Academic recovery following probation for participants [% of students recovering good academic status after being placed on probation; application rates for new STEM transfer students; matriculation rates for new STEM transfer students; Number of faculty participating in research mentor training; number of students participating in research mentee training and summer research immersion program; number of faculty and staff participating in cultural fluency workshops. Annual increases in outcomes are identified and results will be evaluated within the framework of a quasi-experimental design with impartial measurements of quantitative and qualitative data.

PROJECT ABSTRACT: Saint Peter's University (SPU), Jersey City New Jersey

SERVICES PROVIDED AND ACTIVITIES CONDUCTED: *SURGE* (STEM

Undergraduate Retention Graduation and Empowerment) is a student-centered, faculty-driven, holistic STEM student success initiative guided by the evidence-based, institutional experience, programmatic weaknesses and performance gaps within the institution, and strategic goals. Activities are grouped into five strategies that support Absolute Priorities 1 and 2, and taken together are designed to increase enrollment, retention, academic performance, and graduation of Hispanic and low-income students in STEM.

STRATEGY 1: *Integrated Services Providing Holistic Support* establishes a holistic STEM Engagement Center offering faculty and peer tutoring, comprehensive advisement, early alert, loaned laptops, calculators and textbooks, and non-cognitive workshops.

STRATEGY 2: *Seamless Pipeline for Recruitment and Retention in STEM* creates a dual admissions program for STEM majors from Hudson County Community College whose students will have full access to the STEM Engagement Center and summer research opportunities. This strategy expands high school outreach activities adding bilingual workshops for parents and summer research experiences. The strategy also includes supports, conducted by the STEM Engagement Center, to counsel STEM majors from switching away from STEM and encourage non-STEM majors to declare a STEM major.

STRATEGY 3: *Curriculum to Improve STEM Success Rates* provides training in evidence-based pedagogies to all STEM faculty with incentives to select and incorporate evidence-based practices into the syllabi for gateway courses.

STRATEGY 4: *Engagement Through Research* provides access to paid faculty-student research opportunities in newly renovated labs for Hispanic and low-income STEM majors, as well as summer research experiences for high school and Hudson County Community College students.

STRATEGY 5: *State of the Art Technology Supporting Student Success:* Supporting all five strategies are infrastructure and technology enhancements. The STEM Engagement Center will administer the new early alert process using new software and provide loaner laptops and calculators. Upgraded classrooms for STEM courses and a computer lab surround the STEM Engagement Center and students and faculty will conduct research in upgraded labs.

COMPETITIVE PREFERENCE PRIORITY 2: SPU will replicate the Stephens study at an institution with higher proportions of Hispanic, low-income and first-generation students. SPU will implement the experiment twice and then implement the intervention with all incoming and transfer STEM students. Stephens, N., Hamedani, M. & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science*, 25(4): 943–53. www.psychology.northwestern.edu/documents/destin-achievement.pdf.

Generating Access to Navigate and Achieve in STEM (GANAS)

To improve the participation and success of underrepresented minority (URM) students in STEM, Cañada College proposes a project entitled “Generating Access to Navigate and Achieve in STEM (GANAS).” The project will serve URM and low-income STEM students in the San Mateo County Community College District.

The objectives of GANAS are to: (1) increase the success rate for URMs in foundational math courses key to STEM pathways; (2) decrease time to transfer by increasing success in STEM prerequisite courses with pre-semester academic support; (3) improve STEM faculty effectiveness in the classroom through pedagogies and strategies that promote student engagement; and (4) strengthen relationships and articulations with 4-year universities.

The GANAS project will create a *STEM Exploration Week* to introduce new-to-campus students to STEM fields and potential careers. GANAS will also create a one-semester contextualized *STEM Success* course designed to impart skills necessary to be successful students. Supplemental instruction and academic counseling will be provided to support the students in this cohort.

GANAS will develop an ongoing faculty professional development program for professors in STEM disciplines. The program will focus on workshops where faculty will receive training on engaging learner-centered educational practices. Subsequently, cohorts of STEM faculty will be formed to study research-based practices and develop, implement, and refine lessons.

GANAS will work with 4-year institutions to update articulation agreements and create new ones. GANAS will create materials that translate UC Transfer Pathways into Major Pathways for STEM students. To improve articulation GANAS will partner with: California Polytechnic State University-San Luis Obispo, California State University (CSU)-East Bay, CSU-Fresno, CSU-Los Angeles, San Francisco State University, San Jose State University, University of California (UC)-Berkeley, UC-Davis, UC-Merced, UC-Riverside, and UC-Santa Cruz.

GANAS will achieve the following outcomes by Year Five: (1) increased retention and success for URMs in foundational STEM courses; (2) increase in number of URMs in transfer level STEM courses, and (3) increase in number of URMs transferring to a 4-year STEM program.

This proposal addresses the *HSI STEM and Articulation Competitive Preference Priority 2* through a *Difference-Education Intervention*¹ and the implementation of an accelerated math curriculum². The *Difference-Education Intervention* is based on a study that meets What Works Clearinghouse Evidence Standards without reservations.

¹ Stephens, N.M., Hamedani, M.G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students’ academic performance and all students’ college transition. *Psychological Science*, 25(4),943-953.

² Hayward, C.& Willett, T. (2014). Curricular redesign and gatekeeper completion: A Multi- college evaluation of the California Acceleration Project. Berkeley, CA: The Research and Planning Group for California Community Colleges.

ABSTRACT

Bayamon Central University (BCU), a private, nonprofit Hispanic-Serving bachelor's and master's level liberal arts postsecondary institution, is located in Bayamón, the second largest city in Puerto Rico (pop. 3.6 million) within a densely populated San Juan Metropolitan Statistical Area (pop. 2.6 million). During 2014-2015, among 1,688 undergraduate students, a majority was low-income (82% Pell) and Hispanic (99%).

The Project Design specifically addresses the target population of Hispanic and low-income students in Puerto Rico. The overarching goal is to increase student participation, success and persistence to degree in STEM fields.

Effective STEM Teaching Practices: The BCU STEM Project will provide training to faculty and support for designing active learning instruction for Life Sciences courses, addressing falling enrollments and low academic success. Classrooms and labs will be designed as active learning spaces to support teaching practices recognized as being more effective than lecturing.

Expanding and Improving the Computer Science Program: The Computer Science Program curriculum will be redesigned to meet American Board of Engineering and Technology standards for effective teaching and student success, with an emphasis on competency- and project-based instruction. To expand degree options, BCU will develop two new concentrations (Geographical Information Systems and Health Informatics).

Embedded Learning Assistance: To support academic success, Learning Assistants (LAs) will be embedded in STEM prerequisite and major courses with the lowest success rates. The Learning Assistants will be able to assist struggling students during class and provide immediate feedback about their understanding of the course material.

Faculty and Student Research Mentoring: To promote persistence to degree for students, undergraduate research opportunities and faculty-student mentoring will be developed. Research mentoring is correlated to improved retention in STEM studies.

Model Transfer Support and Articulation: Cross-institutional faculties (BCU and Humacao Community College) will collaborate on aligning Computer Science (CS) program requirements and student learning outcomes for successful transfer to BCU. A three-week Computer Science Academy for two-year CS students at Humacao Community College will provide hands-on activities, mentoring by BCU faculty and students, and information connecting CS degree programs to career opportunities to promote transfer to four-year STEM studies.

STEMConnect+ Coaching: To promote retention and degree completion, a cohort of first entering STEM students will receive personalized mentoring support via email, texting, phone, and social media over four years of their college experience.

Absolute Priorities: Project services and activities are designed to improve student success, provide model articulation/transfer services and promote degree completion in STEM studies.

Competitive Preference Priority #2: The STEMConnect+ intervention is based on a study meeting moderate evidence of effectiveness with statistically significant results (Bettinger, E. P., & Baker, R. *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring*, Stanford University, Working Paper No. 16881, 2011). <http://www.nber.org/papers/w16881>

Contact: Thomas J. Santana, Planning & Institutional Development, Bayamon Central University, (788) 7786-3030, Zaya Verde Ave. La Milagrosa Urb. Hato Tejas, Bayamón, PR 00960 tsantana@ucb.edu.pr

ABSTRACT

Hartnell GPS Project for 2016 - 2021

Hartnell College is a public, two-year, Hispanic-Serving Institution located in Salinas (Monterey County), California. Hartnell College student demographics mirror the region - 73% of our 14,000 students are Hispanic, 86% are Pell-eligible and 56% are first generation. Among the identified challenges of our targeted population are high levels of poverty and low educational attainment. The *Hartnell Guided Pathways to STEM (GPS) Project* represents a comprehensive, systemic approach to improve access and opportunity in the STEM fields for Hispanic and low-income residents in our region. The Project's activities will support the achievement of three overarching Goals:

Goal 1: Increase Access and Success in STEM for Hispanic and Low-Income Students

Goal 2: Increase the Number of Hispanic and Low-Income Students Attaining STEM Degrees

Goal 3: Develop Articulation and Transfer Agreements in STEM with Four-Year Institutions

The Project will have measurable and significant outcomes in all three areas; for example: (1) By 2021, the number of Hispanic and low income STEM degree-seeking students will increase from 2534 in 2015 to 3500 in 2021, a 15% increase.; (2) By 2021, the number of Hispanic and low income students successfully transferred to baccalaureate STEM programs will increase by 25%.; and (3) By 2021, there will be an increase in the Fall to Fall persistence rate of Hispanic and low income STEM degree seeking students from 39% in 2015 to 54%, an increase of 15%.

Amount Requested: Hartnell College is requesting \$5,658,286 over five years to support the three programmatic components of this Project and the project management and evaluation activities. This request includes 66% for salary and fringe benefits; 3% for travel, 4% for equipment and supplies; 11% for construction; 2% for contractual; and 14% for other expenses.

Absolute and Competitive Preference Priorities: The **Hartnell GPS Project** addresses the Absolute Priorities by improving access and success in the STEM fields for Hispanic and low-income students. This project will address Competitive Preference Priority #2 to meet the moderate evidence of effectiveness requirement to support the proposed project strategies and activities.

Citation #1: *Schrivener, S., Weiss, M., Raatledge, A., Rudd, T., Sommo, C., & Freques, H. (2015). Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students. New York: MDRC. <http://mdrc.org/publication/doubling-graduation-rates>.*

Contact: Moises Almendariz, Director of HSI Initiatives, Hartnell College; 411 Central Avenue, Salinas, CA 93901; 831-770-7018; malmendariz@hartnell.edu

PROJECT ABSTRACT

This HSI STEM and Articulation initiative *SR², Systemic Reform for Significant Results*, represents a systemic and sustainable effort by New Mexico State University-Carlsbad (NMSU-Carlsbad) to make improvements in student success outcomes, particularly for Hispanic, low-income STEM students. NMSU-Carlsbad is a historic HSI that serves 1,841 students (31% Hispanic) and is the only affordable postsecondary option for a growing population of underserved, underrepresented and disadvantaged students in the region.

The SR² Project is driven by three major goals: (1) Increase Access and Success in STEM for Hispanic and Low-Income Students; (2) Increase the Number of Hispanic and Low-Income Students Attaining STEM Degrees; and (3) Develop Articulation and Transfer Agreements in STEM with Four-Year Institutions.

Specifically, the Project will: (a) improve college readiness of high school students for STEM education; (b) accelerate student progression through transfer-level math; (c) integrate academic support system with high-impact practices to keep students on track to graduation and transfer to baccalaureate STEM program; (d) establish a faculty professional development focusing on the learning needs of Hispanic and low-income students and students in STEM disciplines; (e) develop articulation agreements in STEM with four-year institutions, and (f) create a culture of evidence for informed decision-making. Specific outcomes will include: increase the percentage of Hispanic students in developmental math who successfully complete the transfer-level math course in their first year from 15.6% in 2015 to 30%; increase the percentage of Hispanic full-time STEM degree-seeking students will increase from 8.4% in 2015 to 20%; increase in the first- to second-year persistence rate of Hispanic full-time STEM degree seeking student from 20% in 2015 to 30%; increase the number of articulated STEM programs with regional four-year institutions; and increase the percentage of Hispanic students who successfully transferred to baccalaureate STEM programs.

The Project's overall five-year budget of \$4,369,543 drives systemic reform and capacity building by investing in highly qualified staff (\$2,577,806 or 59.1% of the budget supports salaries, faculty stipends and fringe benefits); in instructional infrastructure (equipment and supplies at \$774,300 or 17.6%); travel (\$353,396 or 8%); and professional development and evaluation (\$285,000 or 6.5%).

The SR² Project addresses both Absolute Priorities of the competition and the Competitive Preference Priority 2. The proposed strategies and activities are supported by the following research evidence that meets the Moderate Evidence of Effectiveness standard of What Works Clearinghouse. *Schriener, S., Weiss, M., Raatledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students. New York: MDRC. <http://mdrc.org/publication/doubling-graduation-rates>.*

ABSTRACT

Los Angeles Harbor College, 1111 Figueroa Place, Wilmington CA 90744

Grant proposal for \$1,200,000 per year for five years.

Project Title: STEM STEP. **Goal:** To increase the number of LAHC Hispanic and low-income students who complete or transfer in STEM fields.

Expected Outcomes: Improved student completion and transfer rates among the targeted population, strengthened model transfer/articulation agreements, and establishment of a resource development mechanisms with engaged STEM alumni and a \$100,000 HSI STEM endowment to support long-term sustainability and support the success of LAHC students in STEM fields/pathways.

Population to be served: Hispanic and low-income STEM students Los Angeles Harbor College (LAHC). The proposed project is comprised of one activity: STEM Success, Transfer, and Equity Program (STEP) with three components: 1) Academic and student Support Services, 2) STEM Professional Development for faculty and staff; and 3) STEM Resource Development.

This proposal addresses the Absolute Priority 1, Absolute Priority 2, and the Competitive Preference Priority 2 following the design of the CUNY Accelerated Study in Associate Programs (ASAP) model as cited below.

Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). Doubling graduation rates: Three-year effects of CUNY's Accelerated Study in Associate Programs (ASAP) for developmental education students. New York:

MDRC. <http://files.eric.ed.gov/fulltext/ED558511.pdf>.
<http://ies.ed.gov/ncee/wwc/ReviewedStudies.aspx> (CUNY ASAP)

California State University, Northridge P031C160053 CA

Project Abstract: Bridging the Gap: Enhancing AIMS² for Student Success

This collaborative project is led by the College of Engineering and Computer Science (CECS) at California State University, Northridge (CSUN), in partnership with five community colleges: Glendale Community College (GCC), College of the Canyons (COC), Pierce College, Moorpark College, and LA Mission College (LAMC). It builds on the highly successful and nationally recognized USDE supported AIMS² program in the college that has served approximately 200 students during the past five years. However, challenges remain in improving overall graduation rates for all Hispanic and low income students given their increasing enrollments across the college's programs. Our proposed community college partners are among the top ten institutions that transferred Hispanic students to the college and represented over 50% of the transfer students in fall 2014. With the new grant, we will increase the numbers of students served to over 500, bridge the achievement gaps, improve transfer success, and increase overall graduation rates for all Hispanic and low-income students in CECS and across CSUN's STEM programs.

Across the partner institutions, we expect to improve student retention and performance in math courses beginning with the freshman calculus course. The team expects to improve the graduation rates in CECS for all students and eliminate the gap between URM's and others. Students enrolled in the AIMS² cohorts will continue to have access to special mentoring and advisement by faculty, tutoring and peer mentoring, social activities, field trips and opportunities to take part in undergraduate research projects. The proposed quasi-experimental evaluation design is expected to produce evidence of effectiveness that will document changes in students who participate in the project.¹ It features a pre-/post-test survey research procedure with matched samples (intervention and comparison groups) that will include baseline equivalence on background characteristics (p.10)². The study will use two widely used survey instruments and institutional data to test the outcome measures and will be administered at project entry and exit for each cohort across sites. The project's performance and outcome measures direct the evaluation study, which will demonstrate favorable gains in the intervention group—consistent with the procedures and findings of two studies reviewed by the What Works Clearinghouse³⁴

Against the backdrop of the literature on Latino/a and low-income students⁵, we have developed project activities to support measurable outcomes, as seen in our logic model, which will be assessed by a rigorous approach that includes a mixed-methods design with survey, institutional, and semi-structured personal interview data. The proposed project has the potential to significantly improve graduation rates and close the achievement gaps for Hispanic and low-income students, expand undergraduate research projects to mentor students, and enhance faculty collaboration between two year and four year institutions to improve student success.

TEAM STEM PROJECT ABSTRACT

Mercy College, a federally-designated Hispanic Serving Institution with the main campus in Dobbs Ferry, New York, is proposing a five-year project, **Team STEM**, under the US ED *HSI STEM and Articulation Program*. The College and our partner institution, Westchester Community College (WCC), also an HSI, are both located in Westchester County. The service area, about 20 miles north of New York City, encompasses both low-income inner city communities with a poverty rate of 10.4% and more affluent suburban communities with median annual household incomes of \$83,422. The total population in 2014 was 976,396 (23.7% Hispanic/Latino; 16.1% Black); 23% of whom are under 18, assuring a pool from which to recruit students over Team STEM's duration (US Census Bureau, 2014).

Team STEM's target population is two- and four-year undergraduates who are Hispanic and/or low-income. Team STEM students are those seeking to major in six STEM disciplines offered at Mercy College: Biology, Psychology, Mathematics, Computer Science, Computer Information Science, and Cybersecurity and to complete a bachelor's degree within six years (three years for WCC transfer students). Team STEM has two goals: 1) to offer three all-new student-centered initiatives designed to improve the persistence, retention and graduations rates of STEM students in the target population and 2) to capitalize on the long-standing articulation agreements between Mercy College and Westchester Community College by jointly sponsoring new activities designed to facilitate and foster the seamless transfer of Hispanic and low-income two-year students into Mercy College's baccalaureate programs in STEM.

To address **Absolute Priority 1 and Absolute Priority 2** and to achieve our project's goals (supported by five measurable objectives), three major innovative Activities are proposed: 1) Tri-point Student Advising; 2) Peer Led Team Learning (PLTL) and Research Study; and 3) the Mercy College/Westchester Community College Transfer Pipeline. Highlights of these new, student-centered activities include personalized advising; ongoing peer mentoring; summer bridge programs focused on acclimating to college; and undergraduate research and internship opportunities. Team STEM students, once enrolled at Mercy, also will have full access to traditional support services including professional and peer tutoring delivered through Mercy's Learning Centers, access to the Library/Learning Commons, computer and science labs, and other campus facilities.

To address Competitive Preference Priority 1, Team STEM also proposes to conduct a Research Study as part of PLTL Activity 3. Our research design is based upon that conducted by Drane, Micari and Light, 2014: <http://www.tandfonline.com/doi/pdf/10.1080/13803611.2014.895388>

Team STEM includes a comprehensive Evaluation Plan that will produce outcomes that will measure Team STEM's success in achieving its objectives. Formative and summative assessments will be guided by an external independent evaluator. Project and student data will be collected and analyzed regularly as a means for informing any modifications which may need to be made to Team STEM's design as implementation is taking place—with the ultimate aim of increasing the persistence, retention and degree attainment of Hispanic and low-income students at Mercy College and Westchester Community College.

ABSTRACT

Institution: Universidad Politécnica de Puerto Rico - Orlando (UPPR-Orlando or UPPR-O, the legal name for the Polytechnic University of Puerto Rico, Orlando campus);
550 N Econlockhatchee Trail, Orlando, FL 32825

Contact: Dr. Wilfred Fonseca, Academic Dean, 407-677-7000 Ext. 803, wfonseca@uppr.edu

Proposed Project: *Inspiring Student Success through STEM*

UPPR-O Profile; Population Served; Target Area: UPPR-O is a private, nonprofit, four-year HSI specializing in engineering programs. It is the Orlando Branch Campus of the Universidad Politécnica de PR (Polytechnic University of PR), which is in San Juan, Puerto Rico. UPPR-O serves predominantly an older student population (average age: 35) within the Orlando metropolitan area. Ninety-five percent of students are Hispanic and 79% are Pell grant eligible. Poverty rates in our service area are high (19.8%, higher than Florida and the U.S.) and median household incomes are low (\$41,901, 11% lower than Florida and 22% lower than the U.S.). We have a very specific niche in terms of our target student population: working adults who want to improve their career options. As a result, UPPR-O provides only evening academic programs.

Project Activities and Services: UPPR-Orlando proposes the following activities and services:

- (1) Establish Comprehensive Student-Centered Support Services – Through these services, UPPR-O will infuse support strategies associated with persistence and success (Tutoring, Success Coaching, and Academic Excellence Workshops) – addresses Absolute Priority 1.
- (2) Create New STEM Programs – Three new academic options (Environ. Engineering, Robotics & Industrial Automation, Smart Grid Technology) will create new STEM pathways.
- (3) Expand STEM Instructional Facilities – This infrastructure improvement will support the new programs, while providing dynamic learning opportunities with modern equipment.
- (4) Develop Online Credit-Bearing Curricula – Making engineering courses available in online format will expand access to STEM curricula for Hispanic, low-income students.
- (5) Develop a Transfer Partnership – Developing a partnership with a 2-year HSI (Hillsborough Community College) will result in a replicable, model transfer and articulation agreement – addresses Absolute Priority 2.

Goals and Expected Outcomes: Overarching goals are to increase enrollment and program completion in engineering fields, improve transfer and articulation processes for Hispanic, low-income students, and increase student success/persistence in engineering programs. Five-year outcomes related to those goals include increased enrollment, to include new transfer students (+110); increased retention rate (+9 perc. pts.); and increased graduation rate (+10 perc. pts.).

Absolute Priorities and Competitive Preference Priority: The proposed project responds to Absolute Priority 1, Absolute Priority 2, and Competitive Preference Priority 2 (CPP 2) (supported by evidence of effectiveness that meets the definition of “moderate evidence of effectiveness”). The citation of the study used to support the evidence requirement for CPP 2 is: Bettinger, E.P., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring. http://cepa.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

Students Transitioning to Engaged and Motivated (STEM) Success Project Abstract

California State University, Stanislaus, Turlock, California

**Contact: Dr. James T. Strong, Provost/Vice President for Academic Affairs
Authorized Organizational Representative. (209) 667-3493 orsp@csustan.edu
Project Director: Ms. Juanita Cruthird-Billups**

California State University, Stanislaus will build on prior successes to address gaps in STEM student attainment and transfer articulation. The proposed project has the following goals in response to both absolute priorities:

- 1) Strengthen and expand transfer articulation with regional community colleges to increase seamless, successful enrollment and graduation of Hispanic and low-income transfers.
- 2) Increase high-impact, student-centered programming in support of discipline immersion, integration into STEM, and academic success by Hispanic and low-income students.

Ongoing efforts through a 2011 Title III award have contributed to increased transfer enrollment and academic success by transfer and non-transfer STEM students. Despite gains, more work is needed to account for newly identified disparities. A significant gap in retention and persistence for lower division Hispanic and low-income STEM students exists. Furthermore, the academic profiles of many STEM transfers lag behind what is needed for timely graduation after transfer.

The proposed project will use a holistic approach to address the diverse and unique barriers experienced by lower division undergraduates and transfers by implementing three activities:

- **Activity 1 – Transfer Articulation:** Building on successes, Stanislaus State will expand transfer articulation practices across top regional feeders. Collaborations will emphasize transfer student outreach and preparation, pre-matriculation advising, and professional development of critical STEM pipeline personnel.
- **Activity 2 – STEM Summer Experience:** Structured, student-centered opportunities will engage incoming freshmen and transfers in early STEM experiences designed to facilitate discipline immersion and exploration that enhances self-efficacy, transition to Stanislaus State, and understanding of scientific research.
- **Activity 3 – Discipline Engagement and Support:** Student-centered programming will facilitate engagement during the critical first years on campus. High impact practices including peer and faculty mentoring, academic support, undergraduate research, and on- and off-campus student engagement activities will foster persistence by generating continued interest and academic success in STEM.

Elements of the project also address Competitive Preference Priority 2 and will cite these studies:

1. Walton, G., & Cohen, G. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331, 1447-1451. <http://dx.doi.org/10.1126/science.1198364>
2. Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science*, 25, 943-953. <http://dx.doi.org/10.1177/0956797613518349>

**HSI STEM Plus: A fusion of evidence-based interventions
designed to impact STEM degree completion**

College of San Mateo, San Mateo, California

About CSM: The College of San Mateo (CSM) has served the diverse educational, economic, social, and cultural needs of its community for 94 years, making it the one of the oldest community colleges in the state and the oldest of three colleges in the San Mateo County Community College District (SMCCCD). Since opening, the College has evolved into a multicultural institution, one that continues a tradition of educational excellence by providing a broad range of quality and innovative programs to serve the academic and vocational needs of its approximately 10,000 culturally and linguistically diverse students. CSM's Mission Statement articulates its commitment to provide an exceptional opportunity to residents of San Mateo County and the Greater Bay Area Region. The College is an open-access, student-centered institution that serves the diverse educational, economic, social, and cultural needs of its students and the community.

Overall Goal: The overall goal for the HSI STEM Plus project is focused on impacting the success, retention, and completion of Hispanic and low-income STEM students.

Activities and Services: Through interrelated and evidence-based services and activities, CSM intends to address identified gaps that act as barriers to academic success for its Hispanic and low-income STEM students. The services and activities are organized within a four-strategy approach: (1) **Develop/improve key STEM program services and activities** (e.g., individualized student coaching; Math/Science Jams; training SI leaders/tutors for gateway courses); (2) **Expand STEM transfer and articulation** (e.g., develop transfer programs for Engineering and Astronomy; Puente Project; Bridges to Baccalaureate with San Francisco State University); (3) **Update STEM curriculum and related technology** (e.g., courses revised to incorporate research components; upgraded technology to support improvements in STEM courses); and (4) **Provide STEM-focused professional development opportunities.**

Outcomes: Expected outcomes include increased enrollment of Hispanic and low-income STEM students; increased semester-to-semester persistence; increased retention and graduation; increased percentage of STEM degree students transferring into STEM fields at four-year institutions; increased percentage of Hispanic and low-income participants who successfully completed gateway courses; and decreased percentage of Hispanic and low-income students on academic probation.

Priorities: The project addresses Absolute Priorities 1 and 2 and Competitive Preference Priority 2. The citation to support the evidence requirement is Bettinger, E. P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring* (Working Paper No. 16881). Retrieved from <http://www.nber.org/papers/w16881>.

Abstract: Scaffolds to STEM Success (S²TEMS) application for HSI STEM Grant

Yakima Valley Community College (YVCC) is proposing a comprehensive program to increase enrollment, retention, completion, and transfer in STEM programs: Scaffolds to Stem Success (S²TEMS). YVCC serves predominately rural, agricultural communities within an 800 square mile service district in south-central Washington State. This program includes new approaches at YVCC to identifying Hispanic and low-income STEM intending students as they enter the college, supporting their transition to STEM readiness, retention in STEM majors, success in STEM courses, and transfer to BA granting institutions in STEM majors.

The S²TEMS program is structured around three levels of intervention: purposeful entrance, accelerated developmental education, and STEM progression. The design of the S²TEMS Program addresses Absolute Funding Priority One by integrating student support services from admissions to orientations to developmental cohort support to transition to STEM coursework and progression to completion. Absolute Funding Priority Two is addressed by the partnerships with Central Washington University and Washington State University to support major-ready preparation for STEM transfer via direct transfer agreements, shared advising protocols, campus visits, and transfer fairs. Additionally, the S²TEMS program will provide professional development for faculty and staff on strategies to increase persistence and motivation as well as discipline specific support for the creation of web-based tools to enhance students' access to materials that address difficult concepts. To meet Competitive Preference Priority Two, YVCC's S²TEMS program will replicate the CUNY ASAP program¹ with fidelity to the target students, services, and evaluation based on a quasi-experimental design.

To accomplish grant goals and HSI Performance Measures, the S²TEMS program will provide professional development aimed at changing institutional culture to support Hispanic and low-income students; remodel facilities to co-locate Engineering and Physics programs and create STEM Commons areas in two buildings so that students and faculty can interact in less formal atmospheres and build relationships; create curriculum for a STEM college seminar course, developmental math acceleration for STEM readiness, and STEM web-based tools; create a mentor tutor model to both support STEM students as mentor tutors and support developmental STEM intending students; train and support STEM advisors; and enhance statewide transfer agreements with major-ready pathway maps to ensure associate degree completion ready for entering STEM majors.

Project Abstract

Address: 333 S. Twin Oaks Valley Road., San Marcos, CA 92096		
Project Director: Dr. Gerardo Dominguez: (760) 750-8261; Email: gdominguez@csusm.edu		
Project Title: “¡Si Se Puede!” to Close the Equity Gap in Engineering Degree Completion		
Articulation Partners (all partners are HSIs from the California Community College System)		
MiraCosta: Total Student Count: 16,502; Hispanic Student Count: 6,159 (37.32%)	Mt. San Jacinto: Total Student Count: 16,662; Hispanic Student Count: 7,498 (45.0%)	Palomar: Total Student Count: 24,464; Hispanic Student Count: 10,594 (43.3%)
Target Area to be Served: Improving student outcomes for Hispanic and low-income students by developing a guided engineering pathway to degree completion at CSUSM.		
<p>Goals: 1) Develop innovative degree programs in software engineering and electrical engineering based on principles of guided pathways that close outcome gaps for Hispanic and other underserved students; 2) Develop a fully articulated engineering curriculum and transfer pathway between CC partners and CSUSM; 3) Build and support an educational ecosystem focused on systematic improvement and equitable student success and completion through sustainable institutionalization of evidence-based practices. Outcomes: By Sept. 30, 2021, 1) increase the percentage of Hispanic and low-income students at CC partner institutions who transfer successfully to a four-year institution in an engineering field by 10 points over the baseline; 2) increase the percentage of Hispanic and low-income students who have completed a STEM degree or credential by 10 points; 3) reduce any equity gaps between Hispanic and general population students that exist in the performance measures by at least 50%. Objectives: 1) approx. 240 Hispanic and low-income students will have participated in grant-funded student support programs or services; 2) increase the percentage of Hispanic and low-income first-time, full-time degree-seeking students who were in their first year of postsecondary enrollment in the previous year and remain enrolled in the engineering pathway the following year by 15 percentage points over baseline; 3) increase the percentage of Hispanic and low-income students in the engineering pathway who successfully complete gateway courses within two years by 10 percentage points; 4) increase the percentage of Hispanic and low-income students in the engineering pathway who complete 30 units within 2 years by 10 percentage points.</p>		
Services to be provided and Activities to be conducted		
<p>Engineering Pathway: Guided pathway principles; 4-year engineering curriculum/two tracks; modern learning spaces. Pathway Supports: Intrusive, dedicated, decentralized, caseload advising; linked classes block scheduled w/seminar; peer coaches; learning assistants; SI; financial supports; HIP pedagogy. Transfer & Career: 2nd level articulation to fully align program outcomes and services; continuous connection to local industries; Ambassador and CC alliance programs. Faculty Development: Project-based, cross-discipline cooperative effort to build seamless guided engineering degree completion pathway.</p>		
<p>Citation/s and links of the studies used to support the CPP #2 evidence requirement:</p> <ul style="list-style-type: none"> ○ Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). <i>Doubling Graduation Rates: Three-Year Effects of CUNY’s Accelerated Study in Associate Programs (ASAP) for Developmental Education Students</i>, New York: MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf. ○ Bettinger, E. P., & Baker, R. (2011). <i>The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring</i>. https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf 		

Project Abstract

California State University, Bakersfield: 9001 Stockdale Highway, Bakersfield, CA 93311
Project Director: Dr. Charles Lam; Phone: (661) 654-2335; Email: clam@csub.edu
Project Title: A Guided Pathway Solution (GPS) to STEM Degree Completion
Articulation Partner: <u>Bakersfield College:</u> 64.8% Hispanic
Target Area: Improving degree completion rates for Hispanic and low-income students declaring STEM majors in CSUB School of Natural Sciences, Mathematics and Engineering.
Guided STEM Pathway Goals and Expected Outcomes: The overarching project goal is to increase the degree completion rate of CSUB STEM majors, and the project is designed to achieve this goal as well as develop a new model to guide continued improvement in solving CSUB's serious overall degree completion problem. The STEM Guided Pathway will be designed according to the principles gleaned from MDRC's rigorous study of CUNY's ASAP program and the evidence from Complete College America's GPS program and will serve as CSUB's first model guided pathway. CSUB will address systemic barriers to STEM degree completion in partnership with Bakersfield College using a Guided Pathways Solution, which requires new models of faculty development, intersegmental collaboration and delivery of student services. This project will enable CSUB to build and support an educational ecosystem focused on systemic improvement and equitable student success and completion through sustainable institutionalization of evidence-based practices.
Services to be Provided/Activities to be Conducted: Development of CSUB's GPS services will be linked to instructional and curricular improvements identified as having the most potential to improve completion outcomes for Hispanic STEM students. CSUB already offers some effective services to support student success, providing a foundation for this innovative institutional development project, but these services are inadequate and fail to reach the neediest students. The guided pathways approach ensures that services, including peer tutoring and coaching, supplemental instruction and learning assistants, dedicated STEM advisors utilizing intrusive and caseload advisement methods, high impact practices including active, project-based and contextualized learning, and financial supports are holistically integrated into a guided degree completion pathway—a design characteristic now known to be the missing ingredient in so many reform efforts. These same principles inform the design and implementation of a new model of professional development, recognizing that student success is best supported through a cross-functional, interdisciplinary team of professionals operating in concert to support students and facilitate learning from entry through degree completion. Anything short of this is unlikely to make the needed difference for underprepared Hispanic STEM students in degree completion.
Project Addresses CPP # 2 by modeling project design on two studies providing moderate evidence of effectiveness: <ul style="list-style-type: none">• Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). <i>Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students</i>, New York: MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf.• Bettinger, E. P., & Baker, R. (2011). <i>The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring</i>. https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

Abstract: Project *Sí Puedo*

California State University, Long Beach (CSULB) is a four-year comprehensive university and Hispanic-Serving Institution (HSI) that enrolls 31,523 undergraduates per year of which 37.8% are Hispanic. CSULB has developed **Project *Sí Puedo*** (Strengthening the Impact by Providing Undergraduate Educational Development Opportunities) to close the achievement gap in STEM baccalaureate degree attainment for Hispanic and low-income students.

Project *Sí Puedo* or “I can do it” is aimed at:

- Improving student academic success.
- Improving timely degree completion and retention.
- Increasing degree attainment for both freshman and transfer students.
- Developing model transfer programming.

Specifically, *Sí Puedo* addresses the Absolute Priority 1 and Absolute Priority 2 as follows:

Absolute Priority 1 (improve student academic success and timely degree completion and retention) by 1) offering student services that include tutoring, mentorship and culturally relevant workshops; 2) executing a freshman summer program to address math preparation for successful completion of gateway courses; 3) redesigning a transfer experience course that increases emphasis on career exploration and science identity within the transfer learning community; 4) implementing a STEM-specific family orientation; and 5) training faculty to engage in culturally responsive pedagogy.

Absolute Priority 2 (increase degree attainment and develop model transfer programming) by 1) implementing first-year freshman and transfer learning communities that aim to increase retention and degree attainment for Hispanic and/or low-income students; 2) offering a STEM transfer-specific orientation and summer bridge research experience program; and 3) creating a student-friendly articulation roadmap between each CSULB STEM major and the top 10 feeder community colleges.

In addition, project *Sí Puedo* addresses **Competitive Preference Priority 2** by implementing a social-belonging intervention as part of the first year introductory courses in the freshmen and transfer STEM EXCEL learning communities that is based on a similar intervention found by Walton and Cohen.* Their study, which meets *What Works Clearinghouse* standards without reservations, found a statistically significant result on cumulative GPA for African Americans and we anticipate a similar result for Hispanic and other low-income students based on comparable inequalities and experiences faced between the groups.

Key project activities include: 1) a summer program for mathematics preparation and placement; 2) freshman and transfer learning communities; 3) peer mentoring and tutoring; 4) supplemental instruction (SI); 5) a summer bridge research experience for transfers; 6) a transfer orientation program; 7) orientation for students and families; and 8) faculty development workshops using cultural engaged pedagogy.

We anticipate that Project *Sí Puedo* will make a significant impact on the educational success and the eventual degree attainment of Hispanic and low-income students in STEM.

*Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331, 1447-1451.

ABSTRACT

Big Bend Community College

7662 Chanute Street NE, Moses Lake, WA 98837

Institution and target area: Big Bend Community College (BBCC, Big Bend) is a public, comprehensive, two-year Hispanic-Serving Institution with a main campus in Moses Lake, WA (pop. 21,141). BBCC serves a two-county, 4,601 sq. mile area in South Central Washington. The service area's population is 43% Latino; the number of Latino residents has increased by 44% since 2000 and is anticipated to grow by another 14% by 2020. Regional per capita income (\$19,424) is less than two thirds that of the state (\$31,233) with family poverty of 23%. Latino residents' per capita income is just \$11,360; 32% of Latino families live in poverty. Just 15% of service area adults hold bachelor's degrees, with only 5% of Latinos holding bachelor's degrees (statewide 32% bachelor's attainment overall, 13% for Latinos).

BBCC (Fall 2015 headcount 2,042) is committed to providing postsecondary access to Latino, high-need students. More than a third of enrollees (36%) are Latino; 76% are first generation in college (93% Latino first generation status); 46% are low income (58% for Latino students). Students entering professional/technical programs are even more disadvantaged: 82% first generation (96% Latino first generation), 57% low income (65% Latino low income) and nearly all (94%) academically underprepared in math (96% Latino math underpreparation).

Proposed project, services, and activities: We propose *Transforming STEM Pathways*, a five-year project addressing the goals of increasing participation in STEM disciplines as well as transfer to bachelor degree STEM programs. Activities and services include the following:

- (1) Develop/pilot two new transferable associate degree options: an associate of science (AS) in Computer Science and an associate of applied science (AAS) in Manufacturing Technology. New degrees will be transferable to bachelor of science programs at Central Washington University (CWU), with whom we will develop articulation agreements.
- (2) Develop/pilot student-centered services, including STEM pathway advising and STEM mentoring, both focused on promoting persistence and bachelor degree transfer in STEM.
- (3) Develop/pilot new emporium-model applied mathematics curricula with competencies aligned with college-level math curricula required for transfer. New curricula will be supported by a professional/technical lab for computer-assisted instruction and infusion of hands-on applied learning using manipulatives in the lab's innovative "maker" space.

Five-year outcomes include increased STEM enrollment (+150, +75 Latino/low income), increased completion of transferable associate of science degrees (+8 percentage points), and an increase in the number of students completing professional/technical credentials and transferring to baccalaureate STEM programs within three years (+10 percentage points).

The project addresses Absolute Priorities and Competitive Preference Priority 2, with mentoring incorporating strategies with evidence of effectiveness that meets WWC evidence standards:

- Bettinger, E.P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring.* http://cepa.stanford.edu/sites/default/files/bettinger_baker_030711.pdf
- Castleman, B. & Page, L. (2014). *Freshman year financial aid nudges: An experiment to increase FAFSA renewal and college persistence.* http://curry.virginia.edu/uploads/resourceLibrary/29_Freshman_Year_Financial_Aid_Nudges.pdf

Year 1 Budget Request: \$949,125

Community College of Denver P031C160095 CO

ABSTRACT

Address: Campus Box 250, PO Box 173363 Denver CO 80217-3363

In spring 2016, Community College of Denver enrolled 9,000 students, 34 percent of whom selected science, technology, engineering, and mathematics (STEM) disciplines. Fifty-seven percent of CCD students are first-generation college students, 50 percent are ethnic minorities, 27 percent are Hispanic, and 57 percent are women. Sixty percent of CCD's students are financial-aid eligible based on income.

Through the Title III grant, CCD plans to implement the STEM Sirviendo Project , with the following goals:

1. Improve STEM by leveraging existing student services programs and proven best practices that increase Hispanic student STEM enrollment, persistence, academic progress, and completion;
2. Catalyze a teaching and learning transformation in the Center for Math and Science (CMS) through intensive faculty and curriculum development, greater faculty diversity and cultural competence, and robust assessment of student learning, all housed within the CMS Center for Excellence in Teaching and Learning;
3. Improve, strengthen, and cultivate articulation partnerships with 4-year institutions;
4. Ensure sustainability of the project initiatives through holistic change management and assessment practices.
5. Improve the capacity of the college to promote student success and organizational responsiveness by establishing an endowment to be grown and administered by the Community College of Denver Foundation (CCDF).

Our four-year partners for articulation Colorado School of Mines, University of Colorado at Boulder, University of Colorado at Denver, and Metropolitan State University of Denver, will partner in the intentional shaping of culture to welcome transfer students into their new four-year destinations and nurture greater success in degree completion.

We have addressed Competitive Priority Preference #2 in the proposal.

M. Heo, "Digital Storytelling: An Empirical Study of the Impact of Digital Storytelling on Pre-Service Teachers' Self-Efficacy and Dispositions towards Educational Technology," *Journal of Educational Multimedia and Hypermedia*, vol. 18, p. 405, 2009.

C. M. Hung, G. J. Hwang, and I. Huang, "A Project-based Digital Storytelling Approach for Improving Students' Learning Motivation, Problem-Solving Competence and Learning Achievement," *EDUCATIONAL TECHNOLOGY & SOCIETY*, vol. 15, pp. 368-379, 2012.

PROJECT ABSTRACT: 2016 HSI STEM AND ARTICULATION PROGRAM

Name: Gavilan Community College: 5055 Santa Teresa Boulevard, Gilroy, California 95020

Title: Strengthening Hispanic STEM Students: Comprehensive Support, Guided Pathways, Renewed Learning

Articulation Partner: San Jose State University (California State University System)

Target Area: Increase transfer/degrees of Hispanic/low income/first generation STEM students

Overall Goals: 1) Increase adequate support of Hispanic & underserved STEM students

2) Develop STEM Guided Pathways (transfer and articulation model with SJSU)

3) Renew STEM Teaching and Learning Opportunities for Faculty and Students

Goal 1: Improve STEM Student Outcomes

a. Increase # STEM Majors to 200 and % who are Hispanic/low income/first-generation

b. Increase STEM transfer rates by 10% and % of those who are Hispanic to 63%

c. Increase # of STEM students completing 30 and 60-unit milestones by 10%

d. Increase completion of STEM BA/BS degrees by 8% (long term data, 4-year partner, SJSU)

Goal 2: Increase Guided Pathway Success

a. Increase # of Guided Pathway students who complete STEM transfer in 3 years by 10%

b. Increase strength of results on replication of ASAP-CUNY study to STEM student outcomes

Goal 3: Increase Teaching-Learning Opportunities

a. Increase # to 50 of STEM faculty who pilot inclusive STEM Culture & High Impact Practices

b. Increase *success (C or better)* of students in introductory math/science courses by 10% (S.I.)

c. Increase success of students in Accelerated math and English by 10%

NOTE: All data will be disaggregated by race/ethnicity to determine equity in all outcomes.

Services and Activities for 5-year Performance Period

Part 1: Increase STEM student support

a. Student access to equipped, centralized STEM Support Center for students in STEM programs

b. Student access to support: STEM Counselor; academic/career advising, tutors, Fac. Mentors

c. Family/local school children: outreach workshops on STEM information and careers

d. Access to Summer Bridge (pre-freshmen) and the Transition Academy (2nd yr).

Part 2: Strengthen STEM pathways to transfer

a. New STEM Guided Pathways, articulated with SJSU: streamlined program maps

b. Opportunity to participate in STEM-ASAP study of efficacy in support and pathways

Part 3: Renew STEM teaching & learning opportunities

a. Students/faculty participate in inclusive STEM culture and High-Impact Practices in pilots.

b. Access: Accelerated remedial math/English & Supplemental Instruction in introductory STEM

c. Access to Student Research Internships STEM projects with SJSU Faculty Supervisors

Competitive Preference Priority 2 Addressed:

Scrivener, S., Weiss, M., Ratledge, A., Rudd, T., Sommo, C., Fresques, H. (2015). *Doubling graduation rates: Three-year effects of CUNY's Accelerated Study in Associate Programs (ASAP) for developmental education students.* New York:

MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf

ABSTRACT

Cumberland County College (CCC), located in Vineland, NJ, is a member of the New Jersey Community College system. CCC serves a diverse county, 28.6% of which is Hispanic. The county has a 20.1% poverty rate and an 8.1% unemployment rate. Among the county's Hispanic population, the poverty rate is 28.1%, and the unemployment rate is 13.5%. Hispanic students comprise 30.7% of CCC's student body.

Strengthening and Expanding STEM Career Pathways creates course sequences that map clear paths and provide for continuous guidance and support for graduation and STEM career entry or baccalaureate transfer. CCC's goal is to increase STEM program enrollment, persistence, degree completion, preparation for career entry, and baccalaureate transfer among Hispanic and low-income students. Absolute Priorities 1 and 2 and Competitive Preference Priority 2¹ are integrated in the project's model of systemic reform, which includes these elements:

1. STEM Career Pathways with an embedded My Academic Plan, mapping course sequences that build toward terminal learning objectives in 2- and 3-year major programs of study;
2. Guided development and management of: (a) individual educational plans with identified "critical pass" courses in the pathway and (b) career plans, supported by career counseling;
3. Case management and continuous advisement, with pathway milestones and touch points from enrollment through graduation;
4. New A.S. program in CyberSecurity and strengthened programs in Biomedical Science, Chemistry, Computer Science, Engineering, Mathematics, and Network Management;
5. 13 redesigned foundational STEM Pathway courses;
6. Linked on-ramp STEM math co-requisite courses for developmental math completers;
7. Supplemental instruction and tutoring, delivered through a new STEM Tutoring Center;
8. Enhanced STEM laboratories and integration of technologies and modularized curricula;
9. STEM Learning Community, facilitated through linked courses and STEM-Smart seminars;
10. 2+2 STEM program articulation agreements with Wilmington and Rowan Universities, with additional university partnerships and 2+2 articulation agreements explored;
11. Professional development for faculty and staff, to support STEM Career Pathways; and
12. Rigorous quasi-experimental design evaluation to demonstrate the new systemic reform model.

End of project outcomes for HSI STEM participants include increased: enrollment (509 to 565); retention rate (from 49% to 60%); 3-year graduation rate (from 15.7% to 30%); and transfer rate to STEM bachelor's degree programs (a 10 percentage point increase above baseline, to be established).

¹Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). *Doubling graduation rates: Three-year effects of CUNY's Accelerated Study in Associate Programs (ASAP) for developmental education students*. New York: MDRC. Retrieved from www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf;

ABSTRACT

Contra Costa College is a public, two-year, Hispanic-Serving Institution located in San Pablo, California. CCC enrolls 6,556 students with 41% Hispanic. Enrollment data reflect socio-economic challenges in the region: 45% of Hispanic students are both low-income and first-generation college students. Among the obstacles for our targeted population are high level of poverty and low educational attainment. 89% of the Hispanic residents do not have a bachelor's degree. Nearly one out of five Hispanic residents live below the poverty level.

The *Caminos al Exito Project* represents a comprehensive, systemic approach to improve access and opportunity in the STEM fields for Hispanic and low-income residents in our region. The project goals will be accomplished through three components:

Component 1: Create a Collaborative STEM Pathway

Component 2: Strengthen STEM Infrastructure

Component 3: Develop an Integrated Academic Support System

The Project will have measurable and significant outcomes in three areas: (1) increase access and college readiness to accelerate success in STEM for Hispanic and low-income area residents; (2) increase in the number of articulation agreements in STEM disciplines with the University of California-Berkeley, University of California-Davis, University of California-Santa Cruz, California State University-East Bay, San Francisco State University, and San Jose State University; and (3) increases in the retention, graduation and transfer rates of students in STEM through case management advising and high-impact educational practices.

Amount Requested: Contra Costa College is requesting \$5,950,694 over five years to support the three programmatic component services and the project management and evaluation activities. This request includes 82% for salary and fringe benefits; 1% for conferences and travel, 8% for equipment and supplies; 6% for other expenses including research, professional development, and external evaluation consultants; and 4% for training stipends.

Absolute and Competitive Preference Priorities: The Caminos al Exito Project addresses the Absolute Priorities by improving access and success in the STEM fields for Hispanic and low-income students. This project will address Competitive Preference Priority #2 to meet the moderate evidence of effectiveness requirement to support the proposed project activities and services.

Citation #1: *Scrivener, S., Weiss, M., Raatledge, A., Rudd, T., Sommo, C., & Freques, H. (2015). Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students. New York: MDRC. <http://mdrc.org/publication/doubling-graduation-rates>.*

Abstract for San Antonio College HSI STEM and Articulation Grant

The “**Tenaces: Staying the Course**” Project will utilize: tutoring, accelerated remedial math and college algebra with Supplemental Instruction, a “grit” intervention in the Learning Frameworks course, STEM contextualization of Learning Frameworks and core courses; faculty professional development, curriculum development, establishment of a 3D Technology certificate/degree program, Early Alert modules on Test-Taking and Note-Taking Strategies, undergraduate research, and development of Pathways from high school and to 4-year programs, **partnering with** UTSA, Sul Ross State U, Texas State U, Our Lady of the Lake U, Incarnate Word U. and St. Mary’s U. (**ABSOLUTE PRIORITY 2**).

GOAL: *To increase the number of Hispanic and low-income students in San Antonio who attain degrees in STEM fields.*

EXPECTED OUTCOMES: 62% of Hispanic, low-income first-time/full-time degree-seeking STEM majors enrolled at SAC are retained in a STEM major from Fall to Fall and at least 19% graduate within three years w/ STEM degree/credential; SAC increases by 30% the number of Hispanic, low-income full-time degree-seeking STEM majors enrolled; at least 80% of Hispanic, low-income STEM majors transferring after 4-6 semesters at SAC have completed core and are on track to complete STEM degree within 3 years of transfer; at least 20% of Hispanic, low-income STEM majors transfer within 4 years from SAC to a STEM major at a 4-year institution.

COMPETITIVE PREFERENCE PRIORITY 2:

SAC’s proposed Stereotype Threat/“Grit”/Mindset intervention is supported by research evidence that meets the What Works Clearinghouse group design standards *without reservations*:

Aronson, J., Fried, C. B., and Good, C. (2001). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, 38, 113–125. doi:10.1006/jesp.2001.1491 Retrieved from U.S. Dep’t of Education, Institute of Education Sciences, What Works Clearinghouse.

TITLE III HSI STEM ABSTRACT
Los Angeles Valley College
PROMOTING AWARENESS OF STEM OPPORTUNITIES (PASO)

Applicant Institution: Los Angeles Valley College (LAVC), an open-door Hispanic Serving Institution and comprehensive, public, two-year community college, serves 19,179 students, of whom 8,041 are Latino (42% of enrollment, Fall 2015) from some of the poorest communities in Los Angeles County's San Fernando Valley. The college offers transfer education, job training and lifelong learning to residents of the San Fernando Valley and beyond.

*Project Title: **Promoting Awareness of STEM Opportunities***

The project is designed to promote STEM awareness in the college and surrounding community of San Fernando Valley in California, attracting more Latino and low-income students to enroll in LAVC, to encourage completion of STEM certificates and degrees, to retain students in STEM fields, to produce more community college STEM transfers to four-year institutions and ultimately to increase the number of Latino and low-income students attaining STEM baccalaureates.

LAVC has the following proposed activities for the PASO Project:

1. Proactive and Intrusive STEM Academic Advising and Peer Mentoring
2. Strengthen STEM Pathway
3. Redesign of Chemistry and Physics Courses
4. Annual Summer STEM Investigations Camp
5. Comprehensive STEM Faculty Professional Development

The Proposed project directly addresses Absolute Priorities 1 and 2, and Competitive Preference Priority #2 – Application is supported by evidence of effectiveness that meets the conditions set out in the definition of “Moderate Evidence of Effectiveness” (U.S. Dept. of Education, Institute of Education Services, What Works Clearinghouse. August 2012. *WWC review of the report: The Effects Of Student Coaching In College: An evaluation of a randomized experiment in student mentoring. Retrieved from <http://whatworks.ed.gov>*).

Total Year One Budget: \$1,200,000

Total Five Year Budget: \$6 million

Eastfield College P031C160113 TX

Eastfield College

3737 Motley Drive, Mesquite, TX 75150

Project Title: *Connect STEM (C-STEM) from Secondary to Postsecondary Completion*

Project Goals and Expected Outcomes:

Goal 1: *Academic Success and Completion.*

Goal 2: *Faculty development and curriculum enhancement.*

Goal 3: *Building STEM-centered infrastructure and culture.*

Goal 4: *Increasing STEM enrollment and success among Hispanic and low-income students.*

Expected Outcomes: An increase in the number of Hispanic and other low-income students who enroll in, persist in and complete degrees in STEM fields as well as enhanced capacity of the institution to provide a continuous STEM-centered learning environment for students enrolled after the grant period.

Competitive Preference Priority Citations: **Bettinger and Baker (2011).**

https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf . **Stephens, Hamedani, and Destin (2014).** <http://www.psychology.northwestern.edu/documents/destin-achievement.pdf>

Partner Institutions in response to Absolute Priority Two:

Texas A & M University at Commerce, TX

The University of Texas at Arlington, TX.

Abstract

Laredo Community College, a Hispanic Serving Institution, 96.19% Hispanic, fall 2015, 8,691, low-income students, 52.61% proposes the Leadership, Excellence and Academic Preparedness in STEM Project (LEAPS) to increase the number of Hispanic and low-income students who attain degrees in the fields of science, technology, engineering, and math (STEM). The previous HSI STEM grant has helped to implement strategies that have increased STEM access and success. This new effort leaps to the next level through evidence-based research to increase the knowledge on successful strategies for Hispanic STEM students, that is statistically significant reliable, replicable and scalable. Currently, there is a dearth of research in this area.

Absolute Priority 1: LEAPS will provide student centered services, tutoring, counseling, and student service programs designed to improve academic success, to retain students and move them rapidly into core courses and program completion.

Absolute Priority 2: LEAPS will increase the number of Hispanic and other low income students attaining degrees in STEM and develop model transfer and articulation agreements between LCC, and TAMU-K, TAMIU, and UTSA, all Hispanic-Serving 4-year institutions.

Competitive Preference Priority 2 Citation: In at least one study, “Undergraduate Student-Faculty Research Partnerships Affect Student Retention,” Nagda, B.A, Gregerman, S. von Hippel, J.W., & Lerner, J.S. *The Review of Higher Education* 22.1 (1998) 55-72, reviewed and reported by WWC to be at the evidence of effectiveness without reservations that participation in undergraduate research opportunities has a significant positive effect on student retention ($p < .03$) and GPA ($p < .07$). The theoretical and conceptual basis for the LEAPS intervention, URO (Undergraduate Research Opportunities) will use a modified version of Nagda’s Undergraduate Research Opportunities Program Model (1998) to include data gathered from prospective fall 2016 focus groups and findings from Editors Nuñez, Hurtado, Calderón Galdeano et al (2015) to meet the needs of STEM students. http://www-personal.umich.edu/~jjonides/pdf/1998_6.pdf

Goals include to investigate the impact of URO participation on student retention defined as students’ persistence through graduation and/or core completion, attrition defined as students’ departure from LCC and academic success defined as cumulative STEM GPA per academic year in a predominately Hispanic STEM student population- population to be served.

Measureable Objectives include gathering objective data to determine the number of students who participate in URO (independent variable); the number and percentage of students who pass identified first-year STEM courses; number of students who persist through graduation; and students’ cumulative GPA (dependent variable). In order to increase research validity, the Five-Tiered Approach to Program Evaluation Model will be used to conduct first year focus groups for the development and evaluation of URO instruments and assessments. In addition, selection of data collection methods will be tested for validity, reliability and cultural sensitivity. A longitudinal quasi-experimental design ($n=1200/4$ years) is proposed with matched experimental ($n = 150/year$) and control groups ($n = 150/year$). For the purpose of meaningful analysis, t-tests will confirm significant differences at $p < .05$ for the experimental group. Descriptive & inferential statistics will be conducted to identify differences among groups, controlling for age, SES and race/ethnicity (controlling variables). A theoretical model for Hispanic student success will be developed using an instrument that is reliable and valid for Hispanic STEM students. External Evaluator, Dr. Alicia Gonzalez-Quiroz, Query Research Designs and Evaluations will spearhead the research, monitor progress, and dissemination. Contact: Dr. Nora R. Garza, West End Washington Street, Laredo, TX. nrgarza@laredo.edu

ABSTRACT

PROJECT: *STEM Student-Centered Success Strategies and New Transfer Degree Options*

INSTITUTIONAL PROFILE: Established in 1978, Humacao Community College in Puerto Rico is a Carnegie Classified private, nonprofit two-year postsecondary institution specializing in programs of study tied to occupational opportunities for a population predominately and severely low-income (average per capita income \$10,966; 48.5% live in poverty). Located in Humacao, Puerto Rico, the College during Fall 2015 enrolled 552 students (100% Hispanic) who were 65% female, 97% low-income and 78% first-generation college. The College serves the Humacao Municipality (pop. 58,466) and adjacent townships (combined pop. 273,611).

Mathematics Supplemental Support: To support academic success for STEM students enrolled in prerequisite college math courses, one-to-one and peer-led group tutoring will be developed and delivered in a new Mathematics Learning Center.

Accelerate Progress for Underprepared Students: To accelerate progress for first-entering students underprepared for college algebra, a summer three-week intensive review will help students acquire basic competencies and allow them to be reassessed with the goal of their enrolling in college level algebra rather than taking basic and/or intermediate algebra first.

STEM Student Coaching: To increase STEM degree completion, Coaches will make regular contact with a cohort of first-entering STEM majors, providing mentoring services over three years. The intervention is modeled on a What Works Clearinghouse reviewed study meeting moderate evidence of effectiveness standards with statistically significant results.

Associate Degree for Transfer Options: To increase equitable access to STEM studies for Hispanic and low-income students, associate degrees for Electronic Engineer Technology, Electric Technology with a Renewable Energy concentration, Computer Networking and Applications and Health Informatics will be developed. Active learning (hands-on, project-based) will be the primary teaching practice for the new programs. Space will be constructed/renovated for equipping technical labs for the programs.

Model Articulation and Transfer: To increase the number of students transferring into a four-year STEM program, the College will develop articulations for the new associate degrees with University of Turabo and University of Central Bayamon in Puerto Rico. Cross-institutional faculties will collaborate to align program requirements and student learning objectives, with input from area engineering and computer science industries/businesses.

STEM Summer Academy: To support Hispanic and low-income degree completion and transfer, a three-week academy will involve STEM majors in informational sessions about careers linked to STEM transfer degree programs and hands-on activities at partner four-year institutions.

Absolute Priorities: Student supplemental math support and student coaching address Priority #1 (student-centered support) and new articulated degree programs and the summer academy activities address Priority #2 (completion and model articulation and transfer).

Competitive Preference Priority #2: The STEM Project proposes to design and deliver a student coaching intervention modeled on a random-control trial reviewed in Bettinger, E. P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring* (Stanford University, Working Paper No. 16881)._

<http://www.nber.org/papers/w16881>.

Project Title: UST STARS Program: Support, Train, Advise, Retain, Systematize

Abstract: UST will create a robust program using WWC strong supporting theories and evidence-based strategies to increase the retention, graduation and transfer rates of Hispanic and low income STEM and nursing students at the University of St. Thomas (Houston, Texas). STARS focuses on training faculty and staff to provide and infuse their student support with culturally-appropriate advising and impactful coaching efforts. STARS is designed to increase the numbers of Hispanic and low-income students that participate in focused student support programs and access services designed to increase their successful completion of pre-requisite and “gatekeeper” courses necessary to complete their degrees in Biology, Chemistry, Math and Nursing. The STARS Program features the creation of a STEM Success Center to coordinate supportive services for Hispanic and low-income students, include intrusive career pathway counseling, a formalized transfer assistance system, peer-to-peer mentoring and on-demand tutoring. New active learning STEM research and nursing simulation modules will be created, delivered and evaluated to prepare students for success in STEM and nursing courses. Students will participate in intensive STEM undergraduate research experiences on new, updated equipment utilizing lab manuals and the new learning modules created specifically to address academic deficiencies of Hispanic and low-income students. Faculty Development will include intensive training on coaching, culturally-appropriate instruction and an ESL/ELL training to designed specifically to support native Spanish-speaking STEM and nursing students and those students with identified writing and comprehension weaknesses. Faculty Development will include training on student support for standardized test taking, designed to better prepare nursing students and improve scores on the NCLEX exam. Endowment funds will allow UST to provide support to the STEM disciplines in the future.

Meets Absolute Priority 1: Develop or enhance tutoring, counseling, and students service programs designed to improve academic success, including innovative and customized instruction courses (including remedial education and English-language instruction) designed to help retain students and move the students rapidly into core courses and through program completion.

Meets Absolute Priority 2: Increases the number of Hispanic and other low-income students attaining degrees in the STEM fields and proposes to develop model transfer and articulation agreements between two-year HSIs and four-year institutions in the STEM fields.

Meets Competitive Priority 2: This project is supported by evidence of effectiveness that meets the conditions set out in the WWC definition of “**moderate evidence of effectiveness.**”

Strong Supporting Theory Used:

Bettinger and Baker (March 2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring.*

Total number of students in the project: At least 3,923 STEM and Nursing students will be served by this grant between October 2016 and September 2021.

Project Abstract, University of La Verne
Address: 1950 Third St. La Verne, CA 91750
Project Director: Dr. Kathleen Weaver: (909) 448-4605; Email: kweaver@laverne.edu
Project Title: Guided Pathway to STEM Success (GPSS) to Close the Equity Gap in STEM
University of La Verne: Total Student Count: 5,209; Hispanic Student Count: 2568 (49.3%)
Articulation Partner – Mount San Antonio College (Mt Sac). Total Student Count: 37,364; Hispanic Student Count: 19,878 (53.2%)
Target Area to be Served: Improving student outcomes for Hispanic and low-income students by developing a guided pathway to degree completion at ULV.
GPSS Goals: 1) Develop a guided pathway for STEM that includes innovative linked-course learning communities, dedicated and proactive support services, and incentives to close outcome gaps for Hispanic and other underserved students; 2) Develop gateway STEM courses that integrate research-informed high impact practices and make student-centered, technology-enabled, and active learning the standard across all STEM degree pathways; 3) Develop articulation agreements and align student learning outcomes to facilitate seamless transfer from community colleges into STEM degree programs. GPSS Outcomes: By Sept. 30, 2021 the project will: 1) increase the percentage of Hispanic and low-income community college students who transfer successfully into a STEM major at ULV by 10 points over the 2016-17 baseline; 2) increase the percentage of Hispanic and low income students who complete a ULV STEM degree or credential by 10 points over the 2016-17 baseline; 3) reduce any equity gaps between Hispanic and general population students that exist in the performance measures by at least 50%. GPSS Pathway Objectives: By Sept. 30, 2021 the project will positively impact: 1) Enrollment. 600 native and 200 transfer Hispanic and low-income students will have participated in ULV GPSS, and approx. 1600 unduplicated students will have enrolled in redesigned student-centered courses; 2) Two Year Retention. The ULV GPSS pathway will increase the percentage of Hispanic and low-income first-time, full-time degree-seeking students who were in their first year of postsecondary enrollment two years prior and remain enrolled in a STEM major the following year by 15 points over the control group; 3) Gateway Success. The ULV GPSS pathway will increase the percentage of Hispanic and low income students who successfully complete gateway courses within two years by 10 points over the 2016-17 baseline.
STEM Degree Pathway: Guided pathway principles; 4-year curriculum across STEM majors; modern learning spaces. Pathway Supports: Intrusive, dedicated, career and academic advising; linked classes in a learning community w/ attached peer learning assistants; peer writing coaches; financial incentives; HIP pedagogy. Transfer: 2 nd level articulation to fully align program outcomes and services; financial incentives; dedicated advising. Faculty Development: Cross-discipline and cross-institutional cohorts to utilize HIPs and build seamless guided pathways to degree completion for STEM Students.
Citation/s and links of the studies used to support the CPP #2 evidence requirement: <ul style="list-style-type: none"> • Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). <i>Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students</i>, New York: MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf. • Bettinger, E. P., & Baker, R. (2011). <i>The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring</i>. https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

ABSTRACT

California State University, Chico (CSUC) is a comprehensive, public, four-year institution located in the largely rural and agricultural Northern Sacramento Valley of California with a designated service area of 12 counties. In Fall 2015, CSUC enrolled 16,098 students (93% undergraduate), including 3,973 STEM majors (24% of undergraduate enrollment), of which 2,156 (13.4%) were classified as Hispanic or low-income (HLI). The proposed *Chico STEM Connections Collaborative (CSC²)* Project will serve 600 students per year. The project addresses **Absolute Priority 1** with an innovative plan of student-centered services supporting academic improvement and degree completion, and **Absolute Priority 2**, through a partnership to enhance transfer and articulation with two nearby Hispanic-Serving Institution Community Colleges, Santa Rosa Junior College and Yuba College. Our explicit goals are to increase the persistence and graduation rates of STEM HLI students and improve the transfer rates of these students through increased preparation and strong articulation. This proposal also responds to **Competitive Preference Priority 2** by replicating a study of the impact of mentoring/coaching on undergraduate students that found persistence rates were higher during the treatment period and that students were more likely to be enrolled one year after coaching had ended. https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf. **This study meets IES standards without reservation as cited in the What Works Clearinghouse.**

The CSC² proposal reflects the close collaboration and strong commitment led by the Deans of the CSUC Colleges of Natural Sciences, Engineering, Computer Science, and Construction Management and Agriculture, who identified academic and social challenges for students in their disciplines and designed evidence-based project activities. The successful outcomes of the ECC MESA Engineering Program (MEP), established at CSUC in 1985, serves as a model that will guide the colleges of NSC and AGR in their implementation of project activities. The five categories of services for students support persistence and graduation performance measures are:

- 1) Academic Support: Math Boot Camp, Supplemental Instruction, Tutoring, Academic Advising;
- 2) Peer Mentoring/Coaching;
- 3) Financial Literacy: Tools to develop college and personal financial plans;
- 4) Undergraduate Research Experiences: Faculty mentoring, academic year and summer; and
- 5) Community College Transfer Support: Peer Transfer Navigators, campus visits, Transfer-Mation (transfer success workshops).

The Project Management Plan reflects the efforts of our committed team of faculty, staff, administrators and evaluator. All of these individuals have significant expertise and are dedicated to working with the students who will be served by the project. The Evaluation Plan includes quantitative and qualitative data collection that is strategically timed and permits time-sensitive modifications to the activities. An HSI Leadership Council, led by the Office of the Provost includes key stakeholders: Deans, the Office of Diversity & Inclusion, the Vice President of Student Services, and representatives from our partner community colleges. The Councils' charge will be to review of institutional policy and procedures, identify opportunities to enhance services for HLI STEM students, and develop an Action Plan to sustain project activities beyond the funding period. Importantly, the proposed project is an innovative and unprecedented collaboration with other CSUs throughout the state to coordinate and integrate project data into one of the largest and most comprehensive evaluations of best practices found in the nation. Therefore, CSUC will play a crucial role in creating systemic change for our diverse and underserved population.

PROJECT ABSTRACT

This HSI STEM and Articulation initiative, the *Senderos Project*, represents a systemic and sustainable effort by Eastern New Mexico University-Roswell (ENMU-Roswell) to make dramatic improvements in student success outcomes for Hispanic and/or low-income STEM students. *Senderos* responds directly to significant challenges, such as large numbers of underprepared students that enter the institution but don't complete STEM programs, academically weak secondary schools in the region, and inadequate resources for professional development and diversity initiatives. The Project is driven by three major goals: (1) Increase Access and Success in STEM for Hispanic and Low-Income Students; (2) Increase the Number of Hispanic and Low-Income Students Attaining STEM Degrees; and (3) Develop Articulation and Transfer Agreements in STEM with Four-Year Institutions.

Specifically, the Project will This project is designed to: (a) improve college readiness of high school students for STEM education; (b) accelerate student progression through transfer-level math; (c) integrate academic support system with high-impact practices to keep students on track to graduation and transfer to baccalaureate STEM program; (d) establish a faculty professional development focusing on the learning needs of Hispanic and low-income students and students in STEM disciplines; (e) develop articulation agreements in STEM with four-year institutions, and (f) create a culture of evidence for informed decision-making. Specific outcomes will include: increase the percentage of Hispanic students in developmental math who successfully complete the transfer-level math course in their first year from 24% in 2015 to 50%; increase the percentage of Hispanic full-time STEM degree-seeking students from 9% in 2015 to 20%; increase in the first- to second-year persistence rate of Hispanic full-time STEM degree seeking student from 7% in 2015 to 15%; increase the number of articulated STEM programs with regional four-year institutions; and increase the percentage of Hispanic students who successfully transfer to baccalaureate STEM programs.

The Project's overall five-year budget of \$2,810,214 drives systemic reform and capacity building by investing in highly qualified staff (\$1,702,4449 or 60.6% of the budget supports salaries and fringe benefits), in instructional infrastructure and professional development (\$457,400 or 16.3% of the request).

The Senderos Project addresses both Absolute Priorities and the Competitive Preference Priority for this competition. The proposed strategies and activities are supported by the following research evidence that meets the Moderate Evidence of Effectiveness standard of What Works Clearinghouse: *Schrivener, S., Weiss, M., Raatledge, A., Rudd, T., Sommo, C., & Freques, H. (2015). Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students. New York: MDRC. <http://mdrc.org/publication/doubling-graduation-rates>.*

Project: Abstract: BMCC Digital Pathways Project

CUNY Research Foundation on behalf of Borough of Manhattan Community College
199 Chambers Street, New York, NY 10007
Two-Year Public

STEM education is vital to the ability of the United States to maintain its position of global leadership and economic competitiveness. With more than 8.6 million STEM-related jobs anticipated by the year 2018, preparing and encouraging students to pursue technical careers is critical. Unfortunately, these developments are occurring at time when the nation's largest pool of potential workers (Latinos and low-income groups) continue to be isolated from STEM related careers. Although the lack of diversity in the sciences is not a new problem, the educational achievement gap among Latinos, coupled with recent demographic and labor supply trends, point to a serious challenge which will adversely impact not only Latinos but the nation's economic future.

The partnership between Borough of Manhattan Community College (BMCC), New York City College of Technology (City Tech) and John Jay College of Criminal Justice responds to this national need by developing a series of comprehensive reforms aimed at addressing the educational achievement gap among Latinos through its HSI Digital Pathways Program. Evidence suggests that the lack of structure in many community colleges is likely to result in less-than-optimal decisions by students about whether, and how to persist towards a degree. Guided pathway programs, which are tightly and consciously structured, is a promising strategy which could have a positive impact on academic persistence among Latinos and low-income students.

The BMCC HSI Digital Pathway initiative is a departure from existing practices by promoting changes which are both structural (by creating STEM pathways) and curricular (by developing relevant STEM content and student-based learning) in order to close the educational achievement gap among Latino and low-income students enrolled in traditional STEM courses (**Absolute Priority 2**). The five-year project will implement a summer bridge program (to *accelerate academic progress*), blocked scheduling, create student cohorts (to ensure students are *integrated* in the life of the program) and deliver *timely and relevant support services* (such as supplemental instruction, mentored research and experiential learning activities) to foster student success and facilitate senior college transfer for Latino and low-income students. Incoming students will be supported in choosing a STEM program of study, and develop an academic plan based on program guidelines created by faculty and advisors. (**Absolute Priority 1**).

The comprehensive evaluation plan and data generated by the BMCC project will shed light on successful practices and provide evidence to assist other postsecondary institutions seeking to adapt the guided pathway model. The proposed BMCC Digital Pathway Project will infuse elements of the *Guided Pathways* and *ASAP* models in two of the college's largest IT departments, Computer Information Systems and Media Arts and Technology. This model is based on research by Scrivener, S., Weiss, M.J. Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). *Doubling graduation rates: Three year effects of CUNY's Accelerated Study in Associates Programs (ASAP) for developmental education students*. New York: MDRC and responds to **Competitive Preference Priority 2 meeting the "moderate evidence of effectiveness" standards.**

ABSTRACT

Description of Target Area to Be Served and Need being Addressed:

St. Mary's University (StMU) is a private, four-year institution located in San Antonio, TX about 150 miles from the Mexico border. Offering graduate and undergraduate programs, StMU's total Fall 2015 enrollment was 3,695, with 2,305 undergraduate students. StMU embraces diversity—78% minority and 70% Hispanic undergraduate population—and serves a local area, Bexar County, marked by disadvantage for a predominantly Hispanic population (59%), up to 22% of whom live in poverty. Despite static enrollment, the University has experienced significant enrollment gains in undergraduate STEM programs since 2010, especially among Hispanic students (up 37%). At the same time, San Antonio has embarked on a mission to build STEM industry in the city. Historically a liberal arts institution, StMU is primed to strengthen and expand its STEM pipeline in order to connect students with growing professional opportunities while building enrollment, but to do so, StMU will have to address several institutional challenges: outdated and inadequate STEM lab facilities and resources, underdeveloped STEM programming, and insufficient services for STEM students.

Title of Project: *Excellence in STEM Education*

Description of Services/Activities, Partner Institutions, and Population to be Served:

StMU's proposed activity has two main initiatives and several components selected in response to institutional gaps and weaknesses that prevent StMU from meeting the needs of our disadvantaged target population (*addressing both Absolute Priority 1 and 2 as noted below*):

1) **Strengthen and Expand STEM Programming** to include the development of core courses for a new Bioinformatics concentration, the redesign of StMU's existing Forensic Science program, and the revision of gateway chemistry and biology courses to include updated capabilities and resources following the renovation and equipping of key chemistry and biology facilities (AP2). StMU will develop new coaching services for entering Hispanic STEM majors (API). StMU will also work with the five Alamo Community College District colleges (all HSIs) to establish model articulation agreements to promote a seamless transfer of ACCD students into StMU's Bioinformatics and Forensic Science programs (AP2).

2) **Increase Capacity for Connecting Students to STEM Education Opportunities** to include the development of STEM transfer services at five local two-year HSI partners—Northwest Vista College, San Antonio College, Palo Alto College, St. Philip's College, and Northeast Lakeview College (AP2). A new system for connecting STEM students with internship and research opportunities will also be developed, targeting all six of StMU's STEM departments (AP2).

Five-Year Total Budget Request: \$5,359,145

Goals and Expected Outcomes:

By project-end, StMU will increase enrollment in STEM programs by at least 6% with at least 50% of new students being Hispanic and/or low income. StMU will double the number of students transferring into its STEM programs. StMU will also increase the number of undergraduate STEM degrees awarded overall (at least 8%) and to Hispanic students (at least 9%).

Citation for Response to Competitive Preference Priority #2:

The Effects of Student Coaching in College: an Evaluation of a Randomized Experiment in Student Mentoring, Bettinger and Baker (2011) available at https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf.

Project Abstract

Lee College located in Baytown, Texas, a Hispanic and Minority Serving Institution, has been effectively serving East Harris, Chambers, and Liberty counties for 82 years. Lee College is a comprehensive, public two-year community college with a Texas Gulf Coast service area covering 2,500 square miles and a suburban/rural population of 220,000 residents. The college serves a diverse student body of 6,150 students and is accredited by the Southern Association of Colleges and School, Commission on Colleges (SACS-COC).

A large geographical area, high poverty rate, and low educational attainment describe the four counties and 13 school districts that Lee College serves. In Baytown, the largest population center of the service area, 42% of the population is Hispanic, 16% are African-American, and 39% are white according to the *2014 American Community Survey of the U.S. Census Bureau* and the college's student population mirrors its largest community. 33% of the population lives below the poverty line and 91% have an educational attainment less than a baccalaureate degree indicating a high number of low-income, first generation students residing in the college's service area.

The LC STEM Project is summarized as follows:

- Serve Hispanic and low-income students pursuing STEM degrees
- The project will be comprised of two interventions: 1) Concurrent Enrollment and 2) Intrusive Transfer Experience.
- Project goal is to increase STEM degree completion and transfer.
- Project objectives are tied to the ED Performance Measures that focus on increasing the number of Hispanics seeking, persisting and completing STEM degrees
- Project Outcomes
 - Higher STEM program completion rate
 - Serve 200 Hispanic and low-income students earn a degree in Instrumentation and Pre-engineering
 - Higher rate of Hispanic and low-income students transferring to a four year IHE
- Lee College in partnership with Lamar University, a four year IHE, will develop a concurrent enrollment model for engineering students.

In the response for Competitive Preference Priority #2 the following research from What Works Clearinghouse was used:

1. The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring – <http://www.nber.org/papers/w16881>
2. Closing the Social-Class Achievement Gap: A Difference-Education Intervention Improves First-Generation Students' Academic Performance and All Students' College Transition” http://ies.ed.gov/ncee/wwc/pdf/single_study_reviews/wwc_stephens_102814.pdf
3. Freshman Year Financial Aid Nudges: An Experiment to Increase FAFSA Renewal and College Persistence” http://ies.ed.gov/ncee/wwc/pdf/single_study_reviews/wwc_castleman_121614.pdf.
4. The Impact of Dual Enrollment on College Degree Attainment: Do Low-SES students Benefit?”

Project Applicant: Passaic County Community College (PCCC)

Project Title: *PCCC Pathways 2 STEM Degrees*

Target Population: 500 Hispanic and low-income high school students, 580 newly-enrolled STEM majors, and 2,125 new and continuing STEM majors

Project Goals: The project will pursue three major program goals and 11 corresponding objectives: 1) Hispanic and low-income students will enter college prepared to succeed in postsecondary STEM; 2) Hispanic and low-income students will complete their STEM degree program on time; and 3) STEM graduates will transfer into Baccalaureate STEM programs.

Project Partners: Rutgers University-Newark, Paterson Board of Education, Passaic County Technical Institute, Latinas in STEM Foundation, and Society of Hispanic Professional Engineers.

Project Description: *PCCC Pathways 2 STEM Degrees* will ready Hispanic and low-income students for postsecondary STEM enrollment; provide them with the knowledge and skills needed to complete their STEM degrees; and propel them into Baccalaureate STEM degree programs. Components include promoting interest in STEM; engaging students in the STEM Pathway; and facilitating student transfer into Baccalaureate STEM Degree programs.

Priorities Addressed: *Absolute Priority 1 and Absolute Priority 2.* PCCC will partner with Rutgers University-Newark to address the articulation/transfer model absolute priority.

Competitive Preference Priority 2. PCCC's student success coaching activity is based on the following study which meets the definition of moderate evidence of effectiveness: Bettinger, E. P. & Baker, R. (2011). *The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring.* Pages 1-21.

https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

ABSTRACT

Puentes Para Éxito: Bridges to STEM Success

Applicant: Universidad Politécnica de Puerto Rico; 377 Av. Ponce de Leon; San Juan PR 00918

AREA AND POPULATION: UPPR is a private, non-profit institution and USDE-designated HSI in Hato Rey, PR, in metropolitan San Juan, enrolling approximately 3,500 undergraduates each semester. Nearly 100% of students are Hispanic, and more than 80% of first-time, full-time students receive need-based aid. Enrollment has declined approximately 30% since 2008, due to population loss and economic distress in Puerto Rico. UPPR remains an essential educational resource for Puerto Rico, offering opportunity to low-income and other non-traditional students.

PROJECT GOALS are to: **1.** Improve access to STEM degree programs and expand UPPR enrollment base via distance learning. **2.** Offer programs reflecting current needs and opportunity using current equipment, tools and resources. **3.** Facilitate student mobility and progress working with partners to articulate programs and align curricula. **4.** Increase retention and academic success, with emphasis on junior-senior progress toward completion. **5.** Offer opportunities for all students to successfully pursue educational goals and realize personal potential. **6.** Increase graduation rates and number of STEM degrees earned by Hispanic and low-income students.

UPPR proposes to improve its practices and capacity for increasing access, retention, and graduation for Hispanic and low-income students in STEM, with emphasis on junior and senior engineering students. **ACTIVITIES AND SERVICES TO BE DEVELOPED** are as follows:

(1) *Increased Access Through Technology.* UPPR has invested in online/hybrid learning, with positive results in enrollment and student success. UPPR must convert senior engineering curricula in order to offer complete, ABET-accredited degree programs in online/hybrid format. A virtualized computing environment will offer digital resources to campus and distant students.

(2) *Improving Curricula, Equipment and Engineering Application Software.* UPPR will develop courses to support an optional emphasis in Healthcare/Life Science for engineering students. The project will also improve equipment and software to ensure high quality programs.

(3) *Increasing Retention, Success, and Degree Completion.* Challenges for upper division students include family and work responsibilities, inadequate study time and resources, and high failure rates in key courses. These will be abated through tutoring, tracking and coaching, goal setting, and transfer student services. An honors option responds to a need for enriched curricula.

With HSI partners, Colegio Universitario de San Juan and Humacao Community College, UPPR will create model articulation agreements and assist students with processes of academic planning, transition to UPPR, and academic success leading to a STEM baccalaureate degree.

Expected outcomes: (1) 3% gain in fall undergraduate enrollment; (2) 20% gain in online/hybrid enrollment; (3) 30 students complete a healthcare/life science option; (4) gain of 10% in transfers; (5) reduced failure rates in key courses; (6) 412 engineering degrees awarded annually, and (7) a 30% six-year graduation rate, for an 8 percentage point gain over a baseline of 22%.

The proposal addresses Competitive Preference Priority 2, and is supported by “moderate evidence of effectiveness.” Studies cited: (1) Bettinger and Baker (2011). *The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring.* (NBER Working Paper 16881). <http://www.nber.org/papers/w16881>; and (2) Morisano, D. *et al.* (2010). “Setting, Elaborating, and Reflecting on Personal Goals Improves Academic Performance.” *Journal of Applied Psychology* 95:2, 255–264. <http://www.selfauthoring.com/JAPcomplete.pdf>.

Universidad Politécnica de Puerto Rico requests HSI STEM and Articulation Program funds totaling **\$5,999,576**, with first year funding of **\$1,199,803**.

ABSTRACT

Miami Dade College North Campus proposes to establish the STEM Engage, Intern, and Educate (STEM EngInE) project to increase the numbers of Hispanic and low-income minorities attaining STEM degrees. This educational program will attract promising Miami-Dade County students to STEM studies, ensuring their attainment of a two-year college credential, and transfer to four-year colleges and universities. STEM EngInE has the following goals: (1) increase the enrollment of Hispanics and underrepresented minorities in STEM programs; (2) increase the retention of Hispanics and underrepresented minorities in STEM programs; (3) increase the graduation rates in STEM fields and decrease the time to graduation for Hispanics and underrepresented minorities; and (4) increase the rates of transfer and articulation to STEM programs for Hispanics and underrepresented minorities.

Project objectives are: (1) increase enrollment in STEM related programs of study by 5%; (2) Participants in STEM EngInE will show retention rates of 70% or more; (3) at least 70% of the STEM participants will graduate within three years of enrollment with an associate's degree in a STEM program, or six years in a bachelor's degree program; (4) at least 80% of program participants who complete a STEM program will transfer to four-year programs of study. The project will offer high school summer camps, peer mentoring, student supports, service learning, research internships at four-year institutions, and an endowment fund. STEM EngInE addresses Competitive Preference Priority 2, implementing mentoring or "coaching"¹ and integrated student supports² to meet moderate evidence of effectiveness standards.

¹ Bettinger, E.P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring*. https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

² Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). *Doubling graduation rates: Three-year effects of CUNY's Accelerated Study in Associate Programs (ASAP) for developmental education students*. New York: MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf

HSI STEM and Articulation Program Application
Schreiner University - Kerrville, Texas

Project Title: *A-STEM (Accelerating STEM Success: Expanding Enrollment, Retention, and Graduation of Hispanic and Low Income Students in STEM Fields)*

Applicant Institution: Schreiner University is private, four-year liberal arts university located in the "Texas Hill Country," 60 miles northwest of San Antonio. The University enrolled 1230 students in 2015, 97% of whom are from Texas and 75% live outside of major metropolitan statistical areas. In Fall 2015, 39.8% of the freshman class was Hispanic.

Challenges Addressed: (1) Fragmented/underdeveloped STEM support services; (2) No STEM, Hispanic, or transfer-focused Learning Communities or Bridge programs; (3) Weak capacity for student research. Instrumentation and lab space inadequate; (4) Faculty development needed in success interventions, effective STEM strategies and technologies;(5) Underdeveloped transfer services and articulation to support STEM transfer programs from two-year HSIs.

Activities Responding to Challenges: (1) Effective & Coordinated STEM Support Services and Center for Quantitative Literacy (CQL); (2) Learning Communities and Summer Bridge targeting Hispanic students; (3) Student Engagement in STEM through Undergraduate Research; (4) Faculty Development in Evidence-Based Success Strategies & Technologies; (5) Articulation of STEM Courses Programs & Services for Transfer Pathways from Two-Year HSIs.

Two-Year HSI Transfer Partners: Schreiner has a signed agreement with Alamo Colleges District in San Antonio, but as detailed in project narrative, will also work to build transfer pathways from other urban and rural two-year HSI institutions.

Competitive Preference Priority #2

The Study: Bettinger, E. P., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring.

The Link: https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

PROJECT ABSTRACT

DEVELOPING A STEM SUCCESS PLAN at EASTERN NEW MEXICO UNIVERSITY

Eastern New Mexico University (ENMU) Station 1, 1500 S. Ave K, Portales, New Mexico

Eastern New Mexico University, a public, comprehensive four-year and graduate Hispanic–Serving Institution, proposes to increase enrollment, retention, and graduation in baccalaureate STEM programs for Hispanic and low-income students by improving access to programs and quality academic opportunities leading to students’ educational and career success.

Over the five years of the project, ENMU will accomplish three initiatives to increase STEM enrollment, success, and program completion. (1) *Strengthen the STEM Pipeline Early Engagement*—with outreach to pre-college, entering STEM freshmen and transfer students; (2) *Pathways to STEM*—designing dynamic articulation programs with area two-year colleges to smooth the transition for transfer students through well-designed 2+2 articulations and support, responding to Absolute Priority 2; (3) *Enhance Undergraduates’ Self-Identification with STEM Fields through Unique Programs and Opportunities* including research, mentoring and tutoring initiatives to support students’ engagement and persistence throughout their STEM educational careers, including supplemental instruction, research mentoring, and internship experiences for undergraduate students.

By September 2021, *ENMU’s STEM Success Project* will have increased (by 6%) the number and persistence of Hispanic and low-income students enrolled in STEM programs. The project will increase number of Hispanic/low income student transfers into STEM programs (+3% over baseline year; 6% by end of project) and will improve Hispanic/low-income students’ graduation rates in STEM fields by 5%. Participants will be positively impacted by project initiatives in terms of retention, success and degree completion. By blending cognitive and non- cognitive elements, reaching out to new and transfer students, providing professional opportunities to STEM students, project has the potential to contribute new or refined strategies to enhance STEM success for low-income and Hispanic students.

ENMU’s STEM Success Project addresses both Absolute Priorities and has identified two studies (Stephens, 2014)¹ and (Bettinger, 2011)² that meet the “moderate evidence of effectiveness” standard of the What Works Clearinghouse (Competitive Priority 2). This research informs ENMU’s project activities relating to the orientation of incoming students and mentoring strategies.

¹ Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students’ academic performance and all students’ college transition. Retrieved from <http://www.psychology.northwestern.edu/documents/destin-achievement.pdf>

² Bettinger, E. P., & Baker, R. (2011). The effects of student coaching in college. An evaluation of a randomized experiment in student mentoring. Retrieved from https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf.

Project Abstract- Project RAISE (Regional Alliance in STEM Education)

California State University, Fullerton (CSUF), Orange County, CA's only four-year public comprehensive university that is also a Hispanic-Serving Institution (HSI)—in partnership with eight of its feeder community colleges (Citrus, Cypress, Fullerton, Golden West, Mount San Antonio, Orange Coast, Santa Ana and Santiago Canyon), also HSIs—has created the Regional Alliance in STEM Education: Raising the Bar in Transfer, Retention and Graduation Rates (Project RAISE). Project RAISE has the overarching aim of constructing a replicable and scalable regional model to increase the number of Hispanic and low-income community college transfer students who complete bachelor's degrees in science, technology, engineering and mathematics (STEM) and enter careers in STEM fields. Leveraging proven interventions and incorporating new and innovative opportunities that are supported by the research literature, it will target Hispanic and low-income community college students at the eight participating community colleges and CSUF who are interested in pursuing STEM bachelor's degrees. In the process, it will create a regional consortium made up of CSUF and the participating community colleges and empower students to streamline their own transfer process.

The student program components include: Undergraduate Research Experience (URE); RAISE Transfer Program (RTP), a series of co-curricular interventions (including an orientation for families) to ease the transition to the university for STEM majors and support them in their first year after transferring; and a Summer Internship Program (SIP). In addition, Project RAISE will provide the community college students with a free web-based articulation resource called Transferology, while a Transfer Resource Center will assist the transferred students in the transition period to CSUF and give them a "home" on campus. CSUF peer advisors will conduct outreach workshops at the partner community colleges and be matched up with students in the URE and RTP to advise and mentor. At the institutional level, CSUF will host a STEM Articulation Conference for partner community college representatives to share up-to-date information on STEM transfer requirements and develop draft articulation agreements.

Two studies from the What Works Clearinghouse provide further evidence of the merits of the Project RAISE model and the value of the Undergraduate Research Experience as an essential part of this model.

1. The first examined the impact of undergraduate research as a high-impact practice at CSUF (Moon, Hershey, & McMahan, 2014).
http://www.fullerton.edu/analyticalstudies/presentations/AIR_UndergResearch_HIPS_Sunny_vFinal.pdf
2. The second study examined the impact of participation in the University of Michigan undergraduate research program on retention (Nagda, Gregerman, Jonides, von Hippel & Learner, 1998). http://www-personal.umich.edu/~jjonides/pdf/1998_6.pdf

ABSTRACT

Organization: Bergen Community College, 400 Paramus Road, Paramus, NJ 07652

Project Title: *STEMatics* **Target Audience:** 2,500+ STEM students annually; 20% or 2,000 first-time full-time degree seeking STEM students, particularly at-risk, low-income and/or Hispanic students (30% or 600) during the five year grant period.

Articulating Institutions of Higher Education: William Paterson University, Ramapo College, Montclair State University, Vaughn College, NJ Institute of Technology, New Jersey City University, Stevens Institute of Technology, Rutgers University

Industry Partners for internships and employment: Triangle Manufacturing, Stryker Manufacturing, United Parcel, Orange & Rockland Utilities, Public Service Electric & Gas

Building on success of Bergen's HSI *STEM GPS* project, this proposed effort integrates multiple supportive strategies to improve academic success and college completion for high-need Hispanic and low-income students. The previous HSI project increased STEM student enrollment by 67%. However, only 27% graduate and 8% transfer within 3 years. Furthermore, withdrawal and failure rates in college-level gateway courses still range upward to 50%. *STEMatics* will alleviate barriers to success by using the *City University of New York ASAP* model¹ that meets the moderate evidence of effectiveness standard, as indicated by the below citation. *STEMatics* will also conduct a randomized controlled trial to assess causal validity of learning and completion impacts associated with Supplemental Instruction in gatekeeper courses. The overarching purpose is to implement and permanently integrate proven student academic and support service practices. Bergen proposes to do so by attaining three goals.

Goal 1: *Strengthen the Learning Engagement of 3,500+ STEM students, particularly among the 30% or 440 (annual cohort) at-risk, first time full time degree seeking low-income and/or Hispanic students. Outcomes:* 1) *Improved Academic Performance (Decrease failure rates by 30% in gateway courses, (2) Enhance Academic Skills & Motivation, (3) Raise Faculty/Staff Sensitivities & Involvement. Goal 2:* *Broaden the role of 20 partners from four-year colleges, industry and government agencies, to become joint stewards of student success. Outcome:* *Strengthened and expanded engagement of academic, industry and government partners in promoting student success, (2) increased student access to barrier free pathways for internships, employment, further education. Goal 3:* *Equip STEM students with the financial tools necessary to persist through degree completion. Outcomes:* (1) *Heightened commitment to and capacity for academic success, (2) increased resources and ability to overcome financial challenges to college completion.* External assessment will support this initiative.

¹Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students. *Scrivener, Susan, Michael J. Weiss, Alyssa Ratledge, Timothy Rudd, Colleen Sommo, and Hannah Fresques.*

Proyecto STEM: Evidence-Based Approaches to STEM Enrollment, Retention and Graduation At an Urban Public Hispanic-Serving Institution

[New Jersey City University](#) will undertake a \$5.8 million program of interventions intended to increase the number of Hispanic and low-income students attaining degrees in six STEM fields at NJCU. This goal will be achieved by improving the 6-year graduation rate for first-time, full-time students and the 3-year graduation rate for first-time, full-time students. [56%](#) of NJCU's undergraduate students belong to underrepresented minority groups, and 52% of NJCU's undergraduates are transfer students, largely from six nearby minority-serving community colleges. Like many of its peer institutions, NJCU works to retain more of its undergraduates.

Activity 1: Promotion of retention & graduation via academic interventions. Activity 1 will overcome challenges experienced by Hispanic and high-need students and ineffective instruction through three strategies: 1) The STEM Success Academy for rising sophomores and incoming transfer students; 2) The improvement of STEM course design and pedagogy; 3) Innovative dual-admit articulation agreements with minority-serving community colleges.

Activity 2: Improvement of instruction and increased retention and graduation through robust learner support and faculty development. Activity 2 will improve the persistence and retention rates of under-graduate students in NJCU's STEM programs through four strategies: 1) A robust system of high-touch interventions, including intrusive advising, peer mentoring, career exploration, and self-service technologies; 2) Supplemental Instruction and peer tutoring in gateway courses; and 3) Networked Improvement Communities of faculty to inform pedagogy, curricular design, and advising capabilities.

Proyecto STEM Objectives include:

- Increased 6-year graduation rate from 25% to 45% for first-time, full-time STEM majors
- Increased 3-year graduation rate from 46% to 56% for STEM transfer students
- Increased 2nd-year retention rate from 67% to 82% for first-time, full-time STEM majors
- Increased 2nd-year retention rate from 77% to 87% for STEM transfer students
- Increased STEM majors population from 18% to 20% of undergraduates
- 60 rising sophomores complete STEM Success Academy and remain in STEM programs
- 1% annual increase in community college transfers to NJCU STEM programs
- Pairing of 60 at-risk STEM majors with College Life Coaches annually
- Supplemental Instruction/Peer mentoring for 500 students in 45 STEM sections annually
- 5 Annual Networked Improvement Communities of 7 faculty convened
- Revision of 20 STEM courses to include inquiry-based learning
- 3 Model transfer articulation agreements executed with community college partners
- Gamified Orientation, Online Process Maps, Transfer Wizards, Transfer Guides

Evaluation of the STEM Success Academy will be conducted as a Quasi-Experimental Design according to the "evidence of promise" standards of the What Works Clearinghouse

Norco College P031C160157 CA

Organization Name: Norco College

Organization Address: 2001 Third Street Norco, CA 92860

Project Title: Strengthening Transfer in Engineering and Matriculation, STEM² Pathways

Goals and Expected Outcomes: (1) Accelerate success and completion in mathematics course sequences; (2) Goal 2: Strengthen engineering pathways and increase enrollment in engineering transfer degrees for underrepresented populations including Hispanic and low-income students.; (3) Increase retention, transfer and career preparation of students in engineering pathways; and (4) Increase collaboration with middle and high schools, 4-year colleges/universities and STEM industry partners.

Populations to be Served: Hispanic, low-income, and other disadvantaged populations.

Partner Institutions: Alvord Unified School District (USD), Corona-Norco USD, University of California, Riverside

Competitive Preference Priorities Citations of Evidence:

1. Student Coaching. Bettinger, E. P., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring.
2. Multiple Measures Assessment Program. Bahr, P., Hayward, C., Hetts, J., et. al. Multiple Measures Assessment and Placement – White Paper, 2014.
3. Completion by Design (CBD). Nodine, T., Jaeger, L., Venezia, A., and Bracco, K. R., with research support from Public Agenda (2012). Connection by Design: Students' Perceptions of Their Community College Experiences. San Francisco, CA: WestEd.

ABSTRACT

Miami Dade College School of Science offers an innovative project to enroll, retain, and graduate Hispanic and low-income students in STEM via STEM Strategic Pathways to Academic Completion and Excellence (STEM SPACE). STEM SPACE uses high-impact strategies and integrated academic and student supports to advance completion and transfer to upper-division programs, or the STEM workforce. The project has three main goals: (1) increase the number of Hispanics and low-income students attaining degrees in STEM; (2) promote the attainment and transfer of Hispanic and low-income STEM students by building upon existing articulation agreements with four-year institutions (3) establish the School of Science Endowment fund, matched by Miami Dade College Foundation.

STEM SPACE will meet these objectives: 1) 10% increase in the number of full-time degree-seeking Hispanics and low-income students enrolling in a STEM program of study; 2) 75% increase in the number of full-time degree-seeking Hispanic and low-income students retained from fall-to-fall; 3) 12% of Hispanic and low-income students will participate in Summer Research Institutes; 4) 30% increase in the number of first-time full-time degree-seeking students transferring to a four-year institution to pursue STEM studies; and 5) establish School of Science endowment. Services include academic pathways, communities of interest, academic/career advisement, peer mentoring, tutoring, professional development, and research experiences. MDC will address Competitive Preference Priority 2, implementing mentoring or “coaching”¹ and academic pathways² to meet moderate evidence of effectiveness standards.

¹ Bettinger, E.P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring*. https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

² Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). *Doubling graduation rates: Three-year effects of CUNY's Accelerated Study in Associate Programs (ASAP) for developmental education students*. New York: MDRC. http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf

Moreno Valley College P031C160162 CA

Project Abstract

Organization Name: Moreno Valley College

Organization Address: 16130 Lasselle Street, Moreno Valley, CA 92551

Project Title: Advancing STEM through CTE (ASC).

Goals and Expected Outcomes: (1) Accelerate success and completion in mathematics course sequences for all students; (2) Create New STEM Pathways; (3) Provide integrated support for STEM pathways; (4) Expand STEM Outreach and Education.

Population to be Served: Hispanic, low-income, and other disadvantaged populations.

Partner Institutions: Val Verde Unified School District, California State University, San Bernardino, Loma Linda University.

Competitive Preference Priorities Citations of Evidence:

1. Student Coaching. Bettinger, E. P., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring.
2. California Acceleration Project. Hayward, C. & Willett, T. (2014). Curricular Redesign and Gatekeeper Completion: A Multi-College Evaluation of the California Acceleration Project.
3. Innovation Center/Makerspace. Sheridan, K, et. al. (2014) Learning in the Making: A Comparative Case Study of Three Makerspaces; and Kurti R. et. al. (2014) The Philosophy of Educational Makerspaces.

Inter American University of Puerto Rico – Bayamón

ABSTRACT

Institution: Inter American University of Puerto Rico-Bayamón
#500 Dr. John Will Harris Road, Bayamón P.R. 00957

Proposed Project: *Expanding and Inspiring Through Opportunities in STEM (EXITOS)*

Institution / Target Area / Population Served: Inter American University of Puerto Rico – Bayamón (IAUPR-B) is a private, nonprofit, four-year, HSI located on the fringes of the San Juan metro area. IAUPR-B serves residents from Bayamón and neighboring cities/towns, an economically distressed area. The median household income for area residents is less than half that of the U.S. (\$24,597 vs. \$53,482) and more than one third live in poverty (35%). IAUPR-B students (Fall 2015 enrollment: 4,630 overall / 2,671 STEM) are 98% Hispanic, 94% Pell grant eligible (low-income), and 32% first generation in college.

Project Activities and Services: IAUPR-B proposes the following activities and services:

- (1) Establish Comprehensive Student-Centered Support Services – Through these services, IAUPR-B will infuse support strategies associated with persistence and success (Tutoring, Success Coaching, and Academic Excellence Workshops) – addresses Absolute Priority 1.
- (2) Create New STEM Programs – Three new academic options (Agricultural Engineering, Agricultural Biotechnology, and Agricultural Chemistry) will create new STEM pathways.
- (3) Improve STEM Instructional Facilities – Modern, industry-standard equipment will support the new programs, while providing dynamic learning opportunities for STEM students.
- (4) Develop Online Credit-Bearing Curricula – Making engineering courses available in online format will expand access to STEM curricula for Hispanic, low-income students.
- (5) Develop Transfer Partnerships – Developing partnerships with 2-year HSIs (Instituto Tecnológico de PR-San Juan and Humacao Community College) will result in replicable, model transfer and articulation agreements – addresses Absolute Priority 2.

Goals and Expected Outcomes: Overarching goals are to increase enrollment and program completion in STEM fields, improve transfer and articulation processes for Hispanic, low-income students, and increase student success/persistence in STEM programs. Five-year outcomes related to those goals include increased enrollment, to include new transfer students (+185); increased retention rate (+8 perc. pts.); and increased graduation rate (+11 perc. pts.).

Absolute Priorities and Competitive Preference Priority: The proposed project responds to Absolute Priority 1, Absolute Priority 2, and Competitive Preference Priority 2 (CPP 2) (supported by evidence of effectiveness that meets the definition of “moderate evidence of effectiveness”). The citation of the study used to support the evidence requirement for CPP 2 is: Bettinger, E.P., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring. http://cepa.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

Year 1 Budget Request: Inter American University of Puerto Rico – Bayamón requests \$1,199,021 for Year 1 of this HSI STEM and Articulation Program project.

Palo Alto College (PAC) requests \$775,000 annually to fund its proposed Title III Part F HSI STEM & Articulation project for a five year period (October 1, 2016 – August 31, 2021) to serve at least 1,000 students with a targeted emphasis on Hispanic and low-income students in San Antonio. The SEEDS of Excellence in STEM Project (Support, Engagement, Experiential, and Development Systems of Excellence in Science, Technology, Engineering, and Math) is designed to **establish college-wide best practices and support systems related to STEM that aim to increase the number of Hispanic and low-income students pursuing and graduating with STEM degrees by: 1) developing comprehensive and collaborative academic and student service programs, 2) strengthening the STEM pipeline, and 3) increasing professional development tools to support STEM student success.** Expected outcomes include integrated student support services, awareness of STEM fields and support on-campus, robust support for faculty and staff, enhanced transfer and articulation agreements with thirty-one partner institutions, and increases in STEM enrollment, persistence, course completion, transfer, and project participation. **SEEDS addresses Competitive Preference Priority 2: Moderate Evidence of Effectiveness and cites two studies on student coaching and moderated panels:**

Bettinger, E., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring (Working Paper No. 16681). National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w16881.pdf>

Stephens, N.M., Hamedani, M.G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science*, 25(4), 943-953. doi: 10.1177/0956797613518349

Saint Mary's College of California P031C160168 CA

ABSTRACT: Caminos a Las Ciencias (CALC)

Saint Mary's College of California
1928 Saint Mary's Road | Moraga, CA 94575 | www.stmarys-ca.edu

Saint Mary's College of California (SMC) seeks a U.S. Department of Education Title III, Part F HSI STEM grant to significantly enhance and expand its curriculum and resources offered to Hispanic students and low-income students (HLI students). SMC is a comprehensive university serving 2763 (FTE) undergraduates and 781 (FTE) graduate and professional students. SMC received designation as an eligible Hispanic-Serving Institution under Federal Title V and Title III programs beginning July 1, 2015.

With HSI STEM funding, SMC will enhance services for HLI students through *Caminos a Las Ciencias (CALC): Pathways to Science*, a comprehensive, strengths-based project designed to yield improvements based on seven measures, all relating to STEM-degree seeking HLI students: first-year retention; six-year graduation; number of student participants; percent of participants successfully completing gateway courses; percent of participants in good academic standing; percent of transfer students on track to complete a STEM degree within three years of transfer; and graduation in a STEM major of all participants. SMC will also measure differences in perceived scientific identity and in campus climate. STEM disciplines at SMC are allied health sciences, biology, biochemistry, chemistry, earth and environmental science, math, and physics, with a secondary focus on psychology. Each year during the grant cycle, CALC will serve 91 first-year HLI students and 171 STEM majors, for a total of 262 HLI STEM students.

CALC pursues five interrelated paths, or strategies, to achieve its goals: 1) STEM Center, 2) Transfer Articulation and Support, 3) Faculty Development, 4) Curriculum Development, and 5) Ongoing Evaluation. Objectives were developed within a contextual framework that considers cognitive, non-cognitive, and climate/environmental factors. Services include tutoring, mentoring, career development, faculty workshops, curricular innovations such as flipped classroom and research-based courses, and qualitative and quantitative evaluation. SMC will partner with Los Medanos College, a two-year HSI, to develop STEM articulation agreements, advising materials, and partnership activities; create a working group of local HSIs; and pilot a transfer bridge and Transfer Year Cohort, services designed to improve HLI transfer students' STEM graduation rates.

SMC has addressed Competitive Preference Priority 2 by utilizing two studies to support how CALC will positively affect the target population's non-cognitive experiences and how CALC outlines pedagogical interventions, academic activities and strategies, and psychosocial supports that have demonstrated effectiveness when working with HLI students. SMC administrators and faculty used an evidence-based approach to design CALC. They will continue to improve it using evaluation results as well as emerging research: **1) Lee, A., Poch, R., & Shaw, M. (2012).** *Special issue: Engaging diversity in undergraduate classrooms: A pedagogy for developing intercultural competence.* ASHE Higher Education Report, v38 n2 p1-132 2012. (2012), <http://onlinelibrary.wiley.com/doi/10.1002/aehe.v38.2/issuetoc> and **2) Stephens, N.M., Hamedani, M.G., & Destin, M. (2014).** *Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition.* Psychological Science. <http://www.psychology.northwestern.edu/documents/destin-achievement.pdf>

PROJECT TITLE: *Student Transfer, Engagement, and Mentoring For Science, Technology, Engineering, Math (STEM-4-STEM)*

PARTNER INSTITUTION(S): *Reedley College, Madera Community College Center, & California State University, Fresno*

TARGET AREA TO BE SERVED: *Fresno and Madera Counties, California*

POPULATION TO BE SERVED: *Hispanic and Low Income students*

SERVICES TO BE PROVIDED: Reedley College STEM-4-STEM will establish comprehensive student-centered services and curricular programs that will increase the rates of remediation, retention, degree completion, and transfer in STEM fields of study. This will be accomplished through three primary activity components: Student: Success Services; Faculty: Curriculum and Alignment; and Expanding Educational Capacity.

ASSOCIATED SERVICES	
Students	Tutorial and counseling, mentoring, course placement & acceleration
Faculty	Curricular alignment (between community college and four year partner), professional development
Capacity	Improved laboratory sciences (number of course offered , instrumentation, and space)

Based on these activities and services, these **goals** and expected **outcomes** will be achieved:

GOALS	OUTCOMES
<i>Success services through intensive interventions</i>	<ul style="list-style-type: none"> Increased the number of Hispanic and Low Income stds in STEM degrees seeking majors by 25% First time, full-time STEM major, Hispanic and low-income students retention will increase by 25% from Fall to Fall Increased the annual number of STEM related degrees awarded by 50%
<i>Increased curriculum and discipline alignment</i>	<ul style="list-style-type: none"> Beginning 2018, increase the number of transfers in STEM fields by 30% over the 2014-15 baseline. Develop 2 new STEM degree programs, articulated for transfer/minimum of 20 new articulated courses.

CCC H.S.I. STEM will address Competitive Preference Priority 2 –

Cited Study for Project Development

Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). *Doubling graduation rates: Three-year effects of CUNY’s Accelerated Study in Associate Programs (ASAP) for developmental education students*. New York: MDRC.

Link: <http://ies.ed.gov/ncee/wwc/quickreview.aspx?sid=20155>

Applicant:

Santa Barbara City College
721 Cliff Dr.
Santa Barbara, CA 93109

Santa Barbara City College has developed an innovative project called Removing Barriers to STEM Success for this Title III Part F competition. It includes a comprehensive non-cognitive structure that weaves through three components: math acceleration and course redesign; Supplemental Instruction; and articulation and transfer. A total of \$5,152,085 is requested over the five-year period. The projects objectives and outcomes are:

Objective	Expected Outcomes
Objective 1: By September 30, 2021, SBCC will increase by a minimum of 15% the number of Hispanic and low-income full-time STEM degree-seeking undergraduate students enrolled.	<ul style="list-style-type: none"> • 153 students successfully complete basic skills classes • SI offered in 656 sections of STEM courses • 150 students take part in non-cognitive activities
Objective 2: By Sept. 30, 2021, SBCC will increase by 8% the retention rate (fall-to-fall) of Hispanic and low-income first-time, full-time STEM field degree-seeking undergraduate students.	<ul style="list-style-type: none"> • At least 200 faculty complete the Escala Institute or non-cognitive training • 100% of Hispanic and low-income STEM students in gatekeeper classes receive services.
Objective 3: By September 30, 2021, document a 20% higher retention (or success rate) for students participating in our faculty mentor program over students who do not have faculty mentors.	<ul style="list-style-type: none"> • 200 students assigned to 20 faculty mentors • Retention rate for mentored students will be 20% higher than for non-mentored students
Objective 4: By Sept. 30, 2021, SBCC will serve at least 7,500 Hispanic and low-income students through grant-funded student support programs or services.	<ul style="list-style-type: none"> • 1,900 students will participate in Supplemental Instruction • 5,685 students will receive instruction through non-cognitive methods
Objective 5: By September 30, 2021, SBCC will decrease the percentage of Hispanic and low income students participating in grant-supported services who are on some form of academic progress or disqualification at the end of an academic year.	<ul style="list-style-type: none"> • The number of students not on academic good standing will decrease by at least 90 students
Objective 6: By Sept. 30, 2021, SBCC will increase the percentage of Hispanic students who graduate in a STEM program or complete the requirements to transfer by 63%.	<ul style="list-style-type: none"> • 19 articulation agreements created, reviewed or revised • 170 students receive transfer counseling from four-year partners • 294 students complete transfer requirements • 75 students assigned to a faculty mentor will complete transfer requirements

Santa Barbara City College will form partnerships with California State University at Channel Islands and Arizona State University. SBCC is responding to Competitive Preference Priority 2. The studies being used for this are:

- “Doubling Graduation Rates: Three-Year Effects of CUNY’s Accelerated Study in Associate Programs (ASAP) for Developmental Education Students,” The link for the study can be found at: <http://ies.ed.gov/ncee/wwc/quickreview.aspx?sid=20155>.
- “The Impact of Supplemental Instruction on Students in STEM Courses: Results from San Francisco State University,” Link found at: http://www.csupueblo.edu/propel/Documents/Impact_of_SI_STEM_2008.pdf

ABSTRACT

The purpose of the UC Santa Cruz SEMILLA Project (Science Education & Mentorship In Latino Lives in Academia) is to cultivate equity-minded reforms designed to challenge and overcome institutional barriers so that STEM-intended Latino and low-income students increase their rates of STEM transfer, persistence and degree attainment. STEM fields are among the most popular majors for all UCSC students, including Latino and low-income students, who arrive at UCSC as STEM-intended. As these students begin their STEM foundational course work in mathematics, chemistry, biology and computer programming, we begin to see disparities in achievement for Latino and low-income students, which results in STEM attrition and fewer students declaring STEM majors. The SEMILLA project is designed to interrupt STEM attrition patterns and social reproduction rooted in both the under-preparation of students and the under-preparation of UCSC to serve Latino and low-income STEM students. The SEMILLA project will serve as focal point and catalyst for a comprehensive set of interventions guided through analysis of student outcomes and inquiry teams to address barriers both in and outside the classroom.

SEMILLA Logic Model End Outcomes/Goals:

1. Reduce attrition of STEM-intended Latino and low-income students at the major declaration milestone by 20% over baseline;
2. Increase the number of Latino and low-income STEM students who graduate in 6-years to 587 students (a 10% increase from current rates);
3. Increase the number of Latino and low income STEM transfer students from partner community colleges by 20%;
4. Increase the 3-year graduation rate for Latino and low-income students from community college partners in STEM majors by 20%.

SEMILLA Grant Components: a) STEM Equity Analysis, Reporting and Engagement, b) STEM Learning Center, c) Faculty Professional Development, d) Holistic STEM Counselors/Early Alert, e) STEM Sense of Belonging, f) STEM Transfer Academy, g) Articulation of STEM majors/course maps serving local partner community colleges: Cabrillo College, Monterey Peninsula College, Hartnell College and San Jose City College.

Competitive Preference Priorities: The SEMILLA grant activities are based upon relevant research directly aligned to STEM persistence and degree completion for disadvantaged students at research universities. Two key research studies guided the design and are referenced below:

Toven-Lindsey, B.; Levis-Fitzgerald, M.; Barber, P.H.; Hasson, T. (2015) "Increasing Persistence in Undergraduate Science Majors: A Model for Institutional Support of Underrepresented Students," *Life Sciences Education*, Vol. 14, 1-12.

Maton, KI; Hrabowski, FA and Schmitt, CL (2000) "African American College Students Excelling in the Sciences: College and Post-college Outcomes in the Meyerhoff Scholars Program," *Journal of Research in Science Teaching*, 37 no. 7, 629-654.

ABSTRACT

CC-Dale Mabry (HCC-DM), 4001 W. Tampa Bay Blvd., Tampa, Florida 33614-7820, is a two-year, public, comprehensive HSI serving those who live in the heart of Tampa's Hispanic community. Unlike more affluent coastal neighborhoods, this area is severely disadvantaged, yet Tampa offers tremendous **opportunity** especially in STEM and related fields.

HCC-DM proposes *Math Success*, whose **Goals** are to serve area residents seeking greater opportunity by

strengthening the STEM-preparatory **pipeline** and increasing students' **enrollment** in higher-level math, **success**, **re-enrollment**, **degree completion**, and **transfer** to four-year institutions.

In 2013, legislative action ended mandatory college placement testing and developmental course enrollment for Florida high school graduates, so enrollment in college-credit math courses has grown. However, not all students are "college-ready," and many others still do not have the math skills on which to build success. HCC-DM therefore proposes *Math Success*, a project that will revise **eight key math courses** enrolling nearly 3,500 students each semester; high failure rates reflect outdated instructional technology that limits learning. **Supplemental Instruction** (SI) will support all revised courses with **enrollment by career cohort** for gateway Algebra courses. The project will **renovate** and **equip nine math classrooms** and a **Math Resource Center** for increased interactivity and college-level support. Services will include **Math Assessment; Advising/Transfer Advising** including **Outreach; Academic Alert/Intervention; Non-cognitive Skill Development** (a project emphasis) with **text message-based "nudging"**; a **STEM Website** with links to services like **Online Exam Review**; a **STEM version of HCC-DM's College Success course; Transfer Success Skills; and Post-Degree Skill Development**. New **Longitudinal Tracking** will support real-time advising, analysis of project interventions' effects, and enhanced tracking of students' progress to graduation, transfer, and beyond. **IT fees** and **equipment** will support increased internet use. The project will also **evaluate Academic Alert/Intervention in College Algebra** according to *What Works Clearinghouse* standards. Last, the project includes a **transfer/articulation partnership** with the **University of South Florida** (USF), our students' most frequent transfer destination and a noted STEM research institution. Partners will collaborate on course revision for transfer, articulation processes, and joint faculty development to increase student success. The project thereby addresses both 2016 **HSI STEM Absolute Priorities** for student-centered services and programs and transfer/articulation partnerships. The budget includes a line item for **Endowment**, which will be matched, invested, and used for STEM student scholarships according to Title III regulations.

Outcomes (increased enrollment, math course success, re-enrollment, graduation, transfer) respond to **ED STEM Performance Measures** #1, #6, #7, and #10. *Math Success* also addresses **Competitive Preference Priority 2** for moderate evidence of effectiveness by focusing on Non-cognitive Skill Development as demonstrated in *Closing the Social-Class Achievement Gap: A Difference-Education Intervention Improves First-Generation Students' Academic Performance and All Students' College Transition*, Stephens et al. (2014), at <http://www.psychology.northwestern.edu/documents/destin-achievement.pdf>, and *Closing the Social-Class Achievement Gap for First-Generation Students in Undergraduate Biology*, Harackiewicz et al. (2013), at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4103196/>.

ABSTRACT

Springfield Technical Community College (STCC) is an urban two-year Hispanic Serving Institution (HSI) in Springfield, MA, the third largest city in the state (pop. 153,991; 61.1% Hispanic or African-American). The City suffers from high unemployment and poverty (77% higher/160% higher than state average) and poor education – the Class of 2015 had a four-year graduation rate of 66.7%, and nearly 25% of residents have less than a high school degree.

STCC offers the education needed to access high-paying jobs. The College serves 6,286 students annually, 27.6% Hispanic; additionally, 56% of STCC students receive federal Pell grants. Only 11.4% of Hispanic students major in STEM; similarly, only 14% of low-income students do. These two groups also enter with greater developmental math needs and lower retention and graduation. The 71.6% of Hispanic and low-income students perform worse on all three measures than students who are only Hispanic or low-income.

The **Hispanic and Low-Income Transformed Education in STEM (HiLITES) Project** activity and expected outcome is to **increase the percent of Hispanic and low-income students entering, progressing, completing, and transferring in STEM disciplines**. There are four goals addressing hurdles for Hispanic and low-income students on the path to a STEM degree and transfer.

- **Goal 1:** Increase the number of Hispanic and low-income students in STEM by 35% through pre-enrollment advisors doing hands-on STEM outreach in schools and joint admissions programs with local four-year institutions, including **Western New England University**
- **Goal 2:** Increase pass rates in developmental (by 14%) and gateway (by 58%) STEM courses (through the redesign of every level of developmental math and entry-level chemistry classes, the introduction of multi-factor placement for math, and a summer boot camp to bring high-tech degree students up to college-level)
- **Goal 3:** Provide student supports to encourage progression (retention increase of 4% pts.) and completion in STEM (by 50%) through pre-enrollment advisors who will advise STEM students and ensure early registration and connection to campus as well as the creation of a STEM Center that houses central tutoring, group study and presentation space, and more
- **Goal 4:** Provide high-quality professional development to STEM faculty (increase by 50%) through College and external experts providing training on teaching at an HSI and topics specific to STEM classrooms, the creation of a regional Hispanic student success in STEM conference, and training on an assessment software package to encourage widespread adoption of student learning outcomes assessment

Competitive Preference Priority 2 Citation: Zimmerman, B.J., Moylan, A. Hudesman, J., White, N., & Flugman, B. (2011). Enhancing self-reflection and mathematics achievement of at-risk urban technical college students. *Psychological Test and Assessment Modeling*, 53. Retrieved from https://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Centers/CASE/enhancing_self_reflection.pdf

California Lutheran University - ALLIES in STEM - Project Abstract

California Lutheran University (Cal Lutheran), a private liberal arts 4-year institution located in Ventura County of Southern California, proposes to address barriers to STEM degree attainment among Hispanic and other low-income students with a plan that addresses institutional gaps while elevating personal and academic traits within students. Cal Lutheran has developed **Access, Learning & Leadership Initiatives to Elevate Students in STEM (ALLIES in STEM)** to strengthen Cal Lutheran's capacity to serve Hispanic and other low-income students majoring in STEM, attending Cal Lutheran and 2-year institutions in the region. Also, K-12 students, attending partner schools in Los Angeles and Ventura counties, will benefit from outreach activities. The project addresses both absolute priorities by providing student centered services including tutoring, advising, mentoring, and career development services and by providing opportunities for Hispanic and other low-income STEM majors to participate in a summer bridge program, faculty-mentored research and STEM internships, and access positions as academic leaders within STEM departments. Faculty and staff will benefit from training focused on delivering culturally competent instruction and advising. Articulation agreements are in place with two 2-year Hispanic-Serving Institutions - Oxnard College and Ventura College. Special efforts to serve transfer students include a dedicated Transfer Coordinator and a bridge program, special orientation programs, and access to faculty-mentored research and internships in STEM. The project also seeks to establish an endowment for STEM research fellowships and provide dedicated space to centralize student services and build community among students.

The goals of ALLIES in STEM are to 1) Institutionalize infrastructure, systems, and strategies to increase enrollment, retention, and completion of Hispanic and other low-income students in STEM; 2) Establish comprehensive strategies intended to cultivate academic mindsets, thus increasing self-efficacy and academic performance of targeted students; 3) Establish evidence-based support systems designed to increase persistence of targeted students from year to year; 4) Increase the number of targeted students, currently enrolled in Kindergarten through community college, who pursue pathways to STEM; and 5) Determine and disseminate the effectiveness of intervention strategies for retaining and graduating targeted students. Expected outcomes for Cal Lutheran's Hispanic and other low-income students in STEM include increased self-efficacy, increased utilization of academic behaviors, feeling socially and academically integrated, and self-identification as future scientists and mathematicians. Long-term outcomes include 80% retention of first-year and transfer students who are Hispanic and low-income students in STEM and a 60% graduation rate for first-year students within six years and transfer students within three years.

Competitive Preference Priority Two: The project incorporates academic mindset development as a non-cognitive intervention strategy found to meet WWC's standards of moderate evidence of effectiveness. See: Walton, G. and Cohen, G. 2011. A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331:6023, 1447-1451. At: <http://science.sciencemag.org/content/331/6023/1447.full>

Humboldt State University

Hispanic-Serving Institutions STEM and Articulation Program

Abstract. Humboldt State University (HSU) is the most isolated of the 23 campuses of the California State University, and the demographic of the local population (75% non-Hispanic White) is different than the rest of the state. Undergraduate enrollment in STEM disciplines is much higher than is average for the CSU system (36% vs. 23%), with life and natural resource sciences especially popular. Since 2010, there has been a 98% increase in Hispanic students. In 2013 we became one of the most northerly Hispanic Serving Institutions (HSI) on the west coast. Graduation and retention rates for underrepresented students in STEM disciplines are unacceptably low. The 4-year graduation rate for incoming STEM freshmen is 10% overall, 5% for Hispanic students, and 7% for low-income students, and by students' second years, there is a 14% gap in retention rates of Hispanic and low-income students compared to all STEM students. Though improved, the 6-year graduation rates are still unsatisfactory (38% and 40% for Hispanic and low-income students).

The ultimate purpose of Humboldt State University's proposal to the Hispanic-Serving Institutions STEM and Articulation Program is to increase the number of Hispanic and/or low-income students attaining Bachelor of Science degrees in Science, Technology, Engineering, and Math (STEM) fields. Reviews of the published literature and institutional data suggest our four core program components, (1) place-based learning communities, (2) enhanced and integrated tutoring services, emphasizing retrieval methods, (3) a new co-curricular approach to math developmental instruction, and (4) strengthened relationships and streamlined articulation agreements with three 2-year HSI institutions (Reedley College, College of the Canyons, and Santa Rosa Junior College), will result in a 5% increase in the 6 year graduation rate of Hispanic and low-income freshmen, a 5% increase in the enrollment and graduation of transfer students, and will cut gaps between student groups in half. Meeting these objectives will yield an 18-20% increase in the number of Hispanic and low-income freshmen and a 17-18% increase in the number of Hispanic and low-income transfers earning STEM degrees annually. Therefore, our proposal addresses **Absolute Priority 1** by involving student centered services designed to improve academic success, retain students in STEM fields, and move them efficiently through degree completion. The components also address **Absolute Priority 2**, by increasing the number of Hispanic and low-income students attaining STEM degrees, and developing model transfer and articulation agreements between two-year HSIs and HSU in STEM fields. Two of the core components also align with **Competitive Preference Priority 2**. Specifically, we show that our plans for (a) place based learning communities and (b) tutoring with retrieval practices are rooted soundly in studies meeting conditions set out in the definition of "moderate evidence of effectiveness" (Sommo et al. 2012¹, Karpicke and Blunt 2011²).

Amount Requested: The project requests \$3,949,145 over the 5 year funding period.

¹Sommo, C., Mayer, A. K., Rudd, T., & Cullinan, D. (2012). Commencement day: Six-year effects of a freshman learning community program at Kingsborough Community College. New York, NY: MDRC.

²Karpicke, J. D., & Blunt, J. R. (2011). Retrieval practice produces more learning than elaborative studying with concept mapping. *Science*, 331(6018), 772-775.

**California State University, Dominguez Hills
HSI-STEM – Abstract**

Organization: California State University, Dominguez Hills
Address: 1000 E. Victoria Street, Carson, CA 90747
Partner Institutions: El Camino, Los Angeles Harbor, and West Los Angeles colleges

Goal: To increase the number of Hispanic and low-income students attaining degrees from CSUDH in the STEM fields. Outcomes include a) larger percentage of CSUDH's Hispanic and low-income STEM students graduate, b) larger number of Hispanic and low-income STEM students enrolled at CSUDH, c) increased first-to-second year retention of new STEM students, d) more meaningful articulation and stronger transfer practices between CSUDH and the colleges, e) increased use of high-impact practices in education by STEM faculty, f) more students pass gateway and bottleneck courses.

Population: CSUDH and the colleges enroll high percentages of first-generation, low-income students of color, especially Latino students. Many graduated from high-poverty schools and need remediation before proceeding to credit courses. Fewer STEM students graduate from CSUDH in six years vs. non-STEM, and their first-to-second year retention is lower. First-time freshmen STEM students take 5.7 years to earn a degree and transfer STEM juniors 3 years. Also, a substantial group of students have temporarily left the university with the intention to return.

Services and Activities: CSUDH and the colleges will create STEM Scholars to recruit 250 total incoming freshmen, transfer juniors and CSUDH juniors to participate, plus Second Chance students who were STEM majors but left CSUDH and are no longer enrolled in higher education. Scholars will commit to participating in core activities: Proactive advising to monitor students' attitudes, study skills, time management and academic performance in order to provide timely, appropriate assistance. Advising in the major to plan a rapid pathway to a degree. Saturday and weekday tutoring. Intensive two-week bridge programs before fall and spring semesters for all scholars to review skills and knowledge required for upcoming STEM classes. Financial aid counseling that is proactive for scholars, and at partner community colleges for potential transfer students. Supplemental activities will increase engagement: participation in faculty research, seminars on careers, Women in STEM Education program, workshops for parents.

STEM faculty from CSUDH and the community colleges will participate in faculty development on high-impact practices in college education and incorporate them, particularly in gateway courses, and study their impact in Faculty Inquiry Committees.

CSUDH and the colleges will share data on students and strengthen articulation agreements. Faculty from CSUDH and the colleges will collaborate to align curricula for prerequisite STEM courses with upper-division courses to eliminate redundancies and fill gaps in student knowledge. The institutions will improve the processes for transfer students.

Competitive Preference Priority 2: STEM Scholars will address CPP 2 by implementing proactive advising for scholars. The relevant study is *The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring* by Eric P. Bettinger and Rachel Baker (2011). The study meets What Works Clearinghouse's moderate evidence of effectiveness. Link: https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

ABSTRACT

Project Title: Santa Monica College STEM Learning and Leadership Innovation Center

Applicant: Santa Monica College
1900 Pico Blvd.
Santa Monica, CA 90405-1628

Collaborative Partners: University of California, Los Angeles

The purpose of the STEM Learning and Leadership Innovation Center is to increase the number of Hispanic and other low-income community college students who pursue, graduate, and transfer to a baccalaureate program in a STEM discipline. Santa Monica College (SMC) will work with the University of California, Los Angeles, and other education and industry partners to increase enrollment, improve student success, and strengthen articulation and transfer in STEM through the following activities:

- Increase enrollment in STEM through the development of an Engineering Program at SMC that includes new coursework, degrees, and certificates in Engineering. The Center will provide a program of study for the highest demand STEM major on campus and establish new articulation agreements with regional Engineering Programs;
- Improve student success by strengthening student support services for STEM students, focusing on Engineering and Computer Sciences. The Center will establish a permanent home for the STEM Scholars Program and expand the focus of STEM supportive resources to include non-cognitive skill development and a sense of belonging in addition to strengthening student skills in math and science.
- Strengthen articulation and transfer through partnerships with UCLA and industry that will:
1) Establish the SMC/UCLA URC/AAP STEM Transfer Bridge Program to include year-round transfer advising and support, honors coursework, and expanded research opportunities; and 2) Create the SLLIC Career and Applied Learning Program to offer industry-based experiential learning opportunities, including internships, for students.

In doing so, the Center will achieve the following outcomes by Year Five of the project:

- 60% of STEM Scholars will graduate within 3 years of enrollment in the program;
- 45% of STEM Scholars will transfer within 3 years of enrollment in the program;

Competitive Preference Priority 2: SMC will incorporate effective practices that meet the definition of moderate level of effectiveness and will positively impact student success outcomes, including GPA, course completion, and graduation/ transfer rates. These practices include peer coaching and social belonging. Overviews of these studies can be found at:

- Peer Coaching: http://ies.ed.gov/ncee/wwc/pdf/single_study_reviews/wwc_studentcoaching_080712.pdf
- Social Belonging: http://ies.ed.gov/ncee/wwc/pdf/single_study_reviews/wwc_walton_012616.pdf

South Florida State College is requesting \$4,854,615 in funding to launch the ***Re-Engineering Our Future*** project, which will revolutionize postsecondary STEM educational opportunities for Hispanic and low-income students in rural, central Florida. The project will primarily serve students from Highlands, Hardee, and DeSoto counties in Florida's economically-depressed Heartland region.

Re-Engineering Our Future will focus on four major project activities: A) Developing a High-Tech degree pathway with transfer into the University of South Florida and Florida Polytechnic University; B) Improving pre-collegiate services to better prepare low-income Hispanic students for these programs; C) Improving college academic support and student services to better support low-income Hispanic college students; and D) Creating a more culturally-sensitive campus culture to increase student engagement and success at South Florida State College. Under these project activities, SFSC will create new degree programs in Engineering, Mechatronics, and Biomedical Science; launch a robust pre-collegiate program to develop a pipeline of prepared students for STEM studies, including a new MathSteps summer program that will utilize the highly-effective UChicago Solutions mathematics curriculum; create culturally-sensitive support services within the college environment; and establish financial support for long-term success of Hispanic and low-income students.

Re-Engineering Our Future addresses both Absolute Priorities as well as Competitive Preference Priority #2 as follows. Absolute Priority #1 is addressed through the culturally-responsive student services and pre-collegiate programming, which will improve the academic success of Hispanic and low-income students. Absolute Priority #2 is addressed through the new degree programs and transfer articulation agreements in Engineering, Mechatronics, and Biomedical Science. UChicago Solutions Math Curriculum and Inside Track College Coaching are part of the project design, which address Competitive Preference Priority #2. UChicago Solutions Math Curriculum will be used to provide math acceleration through the MathSteps program. Inside Track College Coaching will be used to provide transfer students with ongoing support after leaving SFSC. The following studies provide evidence of effectiveness of the chosen interventions:

Bettinger, E. P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring* (Working Paper No. 16881). Retrieved from: <http://www.nber.org/papers/w16881>

Peters, K.G. (1992). *Skill performance comparability of two Algebra on an eighth grade population*. (Doctoral Dissertation) Available at Proquest Dissertations and Theses database (UMI 9314428).

Thompson, D.R.; Senk S.L., Witonsky, D., Usiskin, Z., Kaele, G., (2006). *An evaluation of the second edition of UCSMP*. Chicago, IL. University of Chicago School Mathematics Project.

Re-Engineering Our Future will result in an increase in Hispanic and low-income student enrollment, persistence, and graduation in STEM degree programs.

Abstract

Advising 4 Undergraduate Success (A4US): CSUSB's STEM & Articulation Initiative

Target Area: Inland region of Southern California, encompassing the metropolitan area of San Bernardino and Riverside Counties (Ontario-San Bernardino-Riverside).

Services Provided: California State University, San Bernardino (CSUSB) is proposing to implement an innovative, technologically enabled academic advising program within the STEM disciplines in the College of Natural Sciences (Absolute Priority 1). The advising model outlined in this proposal is designed to directly and significantly contribute to the retention and graduation of Hispanic and socioeconomically disadvantaged students. A particular focus is given both to first time freshman and upper division transfer students. CSUSB faculty will work closely in a professional learning community model with student services staff and peer faculty members from our major feeder community colleges to develop and implement the advising model, as well as improve curricular alignment and articulation between CSUSB and our community college partners (Absolute Priority 2). The new advising process will provide students with the skills they need to maximize their academic success. Becoming engaged in the university both academically and socially is perhaps the most important step for students to take toward assuming responsibility for their education.

Activities to be Conducted: We will develop and implement a comprehensive developmental advising program tailored to the unique needs of first time freshman and upper division transfer students in STEM. The advising model will be implemented via collaborative professional learning communities comprised of CSUSB and community college faculty and student support staff. We will also acquire leading-edge advising and predictive analytic technologies that will enable effective, proactive academic advising. Finally, through the PLCs the faculty from CSUSB and our feeder community colleges will work to improve curricular alignment between the four-year and two-year institutions, and develop model articulation agreements within STEM disciplines. The creation of a dedicated student advising structure within the College of Natural Sciences, and the implementation of robust technological solutions will allow CSUSB to identify at-risk STEM students and plan for intervention in a timely and effective manner. The goal is to empower Hispanic, low-income and other underrepresented students to succeed academically and ultimately to improve persistence and graduation rates in STEM disciplines. Empowered students are more likely to achieve academic success and graduate in a timely manner. Finally, this project involves rigorous research and evaluation utilizing a randomized controlled experiment of the new advising model to produce new strong evidence of effectiveness for the educational literature and promote replication of best practices at Hispanic Serving Institutions.

Citations for Competitive Preference Priority 2: Walton, G. W. & Cohen, G. L. (2011). A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students. *Science* (www.sciencemag.org), Vol, 331, 1447-1451.

Stephens, N., Hamedani, M. G., & Destin, M. (2014). Closing the Social-Class Achievement Gap: A Difference-Education Intervention Improves First-Generation Students' Academic Performance and All Students' College Transition. *Psychological Science*, Vol. 25(4) 943-953.

STEM Bridges Across Eastern Queens

Queens College, City University of New York • HSI-STEM Program Application FY 2016

Abstract

The United States is not producing college graduates with majors in science, technology, engineering, and mathematics (STEM) in sufficient numbers to meet workforce demands. We address this problem through a project targeting the disproportionate attrition in STEM among traditionally underrepresented students and linked to current inefficiencies in transferring from two-year to four-year institutions. Our goals are (1) to graduate more Hispanic and low-income students with Baccalaureate degrees and (2) to develop two-year to four-year articulation agreements.

Our partnership will build STEM bridges across the New York City area of eastern Queens, affecting students at Queens College (four-year) and Queensborough Community College (two-year), both in the City University of New York (CUNY), the nation's largest urban public university. Our project will involve approximately 24,000 students over four years of implementation, preceded by one year of program planning. The evaluation uses a multi-site block Randomized Control Trial design with treatment and control conditions. The project's activities will influence treatment group students in their entry into STEM at two institutions that serve significant numbers of Hispanic (26% at QC, 32% at QCC) and low-income (39% at QC and 49% at QCC) students.

Three interrelated activities will improve access, improve learning, and create bridges for STEM students at QC and QCC. First, a course-redesign activity will improve access, by redesigning courses that "land" students into STEM majors. Second, peer-led instruction and mentoring will improve learning through learning collectives that will foster intellectual growth outside of the classroom (Absolute Priority 1). Third, a cross-campus group of faculty and administrators, dedicated to improving programs, policies, and practices in STEM education, will bridge our two institutions through articulation agreements and shared assessment practices (Absolute Priority 2). The project is infused with evidence-based components, that will direct services to students (particularly Hispanic and low-income students), while also involving faculty in every aspect of the design and implementation. Planned activities draw from up-to-date research on learning communities (Sommo et al., 2012; Weissman et al., 2012) and have been influenced by models of effective practice (Competitive Preference Priority 2).

Project outputs include faculty preparation and improved courses (course redesign), a peer-led infrastructure to support learning (learning collectives), and an institutionalized infrastructure for handling cross-campus articulation and assessment (bridge building). Aligned with the overarching goals of the project (increasing Hispanic and low-income STEM graduates and increasing articulation agreements), outcomes to measure our effectiveness include: data related to academic achievement, credit accumulation, and attainment, and data related to institutional practices.

We stand to make significant contributions that will advance knowledge in a number of areas, including how faculty development and peer-led support and mentoring impact student learning. Our project also holds high promise of triggering widespread system change, given our status as an HSI-eligible four-year institution, and our recognition of faculty as primary agents of change.

PROJECT ABSTRACT

Target Area to be Served: Northeastern Illinois University (NEIU), a federally designated Hispanic-Serving Institution (HSI), is a comprehensive public state university located in Chicago; it serves over 12,000 commuter students in 37 undergraduate and 23 graduate programs. Just over 37% of NEIU's undergraduates are Hispanic, and 63% of its freshmen receive Pell Grants. NEIU's partner institution, Triton College, is 33% Hispanic and serves a predominantly low-income population, with 54% of its first-time, full-time freshmen receiving Pell Grants.

NEIU's proposed project, **EXITO, or Exit On Time in STEM**, is intended to serve Hispanic and low-income students who need developmental academic support, particularly in mathematics; Hispanic and low-income STEM majors needing success coaching; and Hispanic and low-income students participating in STEM research.

Activities and Services by Absolute Priority:

Absolute Priority 1: This proposal was developed to meet Absolute Priority 1 by offering additional supports to Hispanic and low-income students at NEIU and Triton. NEIU and Triton will implement an innovative, modular, co-requisite mathematics enrichment; the enrichment will take place in peer-led team learning (PLTL) communities. Faculty from Triton and NEIU will be offered development opportunities in mathematics teaching and in STEM student pedagogy. NEIU Students will also receive success coaching and will have increased opportunity for faculty-led research in modern environmental science laboratory facilities. All services are designed to increase retention of Hispanic and low-income students, move them rapidly into core courses and through program completion in STEM majors.

Absolute Priority 2: The proposal meets Absolute Priority 2 by forging stronger links between 2-year feeder Triton College NEIU through development of an articulation process model by which agreements and course maps will be generated. The model will align introductory courses taught at Triton and NEIU and will be replicable across appropriate NEIU STEM majors. The model and its resultant agreements will increase the number of Hispanic and low-income students attaining bachelor's degrees in the STEM fields. The model articulation developed will also serve to create similar STEM articulation agreements with other 2-year feeders such as the City Colleges of Chicago.

Competitive Preference Priority 2 Citation:

Bettinger, E., & Baker, R. (2011). The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring (Working paper No. 16881). *National Bureau of Economic Research*. Retrieved from <http://www.nber.org/papers/w16881>.

STEM-CONNECT: Building a Guided Pathway to STEM Success

LaGuardia Community College (CUNY), 31-10 Thomson Ave. Long Island City, NY 11101

Strengthening STEM education at community colleges and building effective transfer pathways is crucial to engaging the talents of Hispanic and other Under-Represented Minorities (URMs) and meeting America's STEM needs. In *STEM-CONNECT*, LaGuardia Community College will collaborate with CUNY partners York College and New York City College of Technology (CityTech) to build a "guided pathway" to advanced STEM degrees, improving STEM education at LaGuardia and supporting students from admission to transfer success.

Addressing both Absolute Priorities for this initiative, *STEM-CONNECT* will strengthen and unify LaGuardia's STEM guided pathways with interventions in three areas:

- 1) Expand access with "productive persistence" advisement and STEM Bridge programs;
- 2) Accelerate progress, using digitally-enhanced academic support to strengthen STEM learning, unify a set of proven High Impact Practices, and speed students to completion;
- 3) Improve transfer effectiveness with model articulation programs and active transfer partnerships with two vital STEM destination campuses.

Serving all LaGuardia STEM students, these interlocking tasks will strengthen STEM success for more than 14,500 Hispanic and other URM students. Systematically transforming STEM education at LaGuardia, *STEM-CONNECT* will spur change across CUNY and the broader field.

LaGuardia is well positioned to address this task. A national leader in community college innovation, LaGuardia serves a student population that is significantly Hispanic and overwhelming minority, low-income, and first generation. LaGuardia has already built such high impact practices as STEM First Year Seminars and undergraduate research. But its STEM pathway is still partial and fragmented. *STEM-CONNECT* will empower LaGuardia to work with transfer partners to create a more cohesive STEM pathway to transfer and careersuccess.

Addressing Competitive Priorities #1 and #2, *STEM-CONNECT* draws on research that meets the evidence standards of the What Works Clearinghouse. Our "productive persistence" strategies will build on Castleman's research showing how this approach improves enrollment effectiveness. MDRC research demonstrating the ways effective learning communities advance student progress towards the degree will guide our work with STEM learning communities.¹

STEM-CONNECT is designed to grow deeper and increasingly effective over the course of the project. Evaluation, including a rigorous RCT study, will inform the field while guiding continuous improvement. Building broad, clear and well-guided STEM pathways, *STEM-CONNECT* will advance success for thousands of Hispanic and URM students, contribute to the knowledge in the field, and create models for replication nationwide.

¹Castleman, Benjamin L., and Lindsay C. Page. *Summer Nudging: Can Personalized Text Messages and Peer Mentor Outreach Increase College Going Among Low-Income High School Graduates?* Charlottesville: University of Virginia, 2014; http://curry.virginia.edu/uploads/resourceLibrary/9_Castleman_SummerTextMessages.pdf; Weiss, Michael J., Alexander Mayer, Dan Cullinan, Alyssa Ratledge, Colleen Sommo and John Diamond. *A Random Assignment Evaluation of Learning Communities at Kingsborough Community College*. Report. New York: MDRC, 2014. <http://www.mdrc.org/publication/random-assignment-evaluation-learning-communities-kingsborough-community-college>

CUNY Initiative to Promote Academic Success in STEM
The City College of New York – 160 Convent Ave, New York, NY 10031

The City College of New York (CCNY) will develop and implement the **CCNY Initiative to Promote Academic Success in STEM (CiPASS)**. The main goals of this initiative are to *improve CCNY graduation and retention rates and increase the number of students receiving STEM degrees*, particularly those from underrepresented groups.

CCNY is the only senior STEM campus of the City University of New York (CUNY) system, the largest urban campus of United States. CCNY hosts the Grove School of Engineering, the only public school of engineering in the New York City (NYC), and is an eligible Hispanic (36% Hispanic) and Minority (17% African American) Serving Institution serving 16,000 students (84% are undergraduates). 33% of the undergraduate population are enrolled in STEM disciplines, but only 20% of STEM students are Hispanic.

Despite a history of providing an excellent, affordable education in STEM for NYC residents, CCNY STEM retention and graduation lag behind national trends. Through deep analysis of data that reveal the challenges our students face, specific areas for improvement are identified: (a) academic readiness prior to entering degree programs; (b) academic performance in STEM courses in the first two years; (c) career engagement opportunities; (d) supporting the transition from 2-year to 4-year college; and (e) and student advising

The *CiPASS* will mobilize five activities as a unified set of continuous intervention strategies: *i*) STEM Summer Bridge program to improve readiness; *ii*) online instruction to support math skills development; *iii*) real-time performance assessment with individualized academic intervention; *iv*) experiential and entrepreneurial learning; and *v*) recruitment and support for transfer students in partnership with CUNY Community Colleges. *CiPASS* will focus on the first two years of college, when the risk of STEM attrition is highest, and will address Competitive Priority #2 based on reported studies.¹

Our quantifiable goal is to increase graduation and retention rates by 25%, and increase the number of students seeking STEM degrees by 30%, from the present benchmarks.

¹ *Getting Ready for College (Wathington and Barnett, 2011); A Brief Social Belonging Intervention (Walton and Cohen 2011).*

ABSTRACT: Alvin Community College

Alvin Community College (ACC), a two-year, publicly-supported college 20 miles south of Houston, serves more than 5,000 students (32% Hispanic) in a 421-square-mile service region in Brazoria County. The majority of students are at high risk of failure because of various characteristics, such as low-income status, first-generation college status, and under-preparedness, which limit their chances for degree attainment (NCES, 2011). These factors are particularly limiting in the region's economic environment, with the exponential growth of the petrochemical industry and its need for high-skilled employees (GCWB, 2015).

The ability of ACC students to succeed in STEM programs, however, has been hampered by weak math skills, as evident in the large number of students (approximately 50% of entering students) who require remediation in the College's two Basic Math courses and often fail College Algebra. In addition, student persistence in ACC's key STEM program (Process Technology) is weak and transfer rates into STEM baccalaureate programs are unacceptably low.

The proposed project, "**Engaging Students: The Path to STEM Success,**" addresses the **two Absolute Priorities** and has three major goals: (1) To improve the achievement of at-risk math students, particularly Hispanic and low-income students, and accelerate their progress to degree completion through enhanced support; (2) To increase STEM degree completions through strategies under Goal #1 and by strengthening Process Technology to include new active learning strategies and supporting technologies; and (3) To increase STEM transfer rates by completing STEM articulation agreements with Brazosport College, Lamar University, and the University of Houston and introducing a new transfer assistance service for students.

Activities will include piloting two new programs for at risk math students: (1) *ModMath*, aimed at helping students accelerate and improve achievement in Basic Math, and (2) *Persist*, offering new support services - a STEM Bridge program, proactive advisement, and math tutoring - to increase math success rates. This project also includes integrating new strategies to motivate students and improve persistence in Process Technology and providing new transfer assistance to help students transition into baccalaureate degree programs.

The proposal also addresses **Competitive Preference Priority #2**, showing "moderate evidence of effectiveness" by modeling our proposed *Persist* program after a successful support program implemented by the City University of New York and analyzed in the WWC-vetted study, Doubling Graduation Rates: Three Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students (Scrivener, et al, 2015, NY: MDRC). In addition, ACC's extensive evaluation plan includes a quasi-experimental study of student persistence and success in the proposed *ModMath* program.

The expected, overall outcome of the project is to significantly increase 3-year STEM Associate Degree completion rates, particularly among Hispanic and other low-income students, and to significantly increase transfer rates into STEM baccalaureate programs.

The applicant is Alvin Community College, 3110 Mustang Rd., Alvin, Texas, 77511.

Research-based Interventions to Increase STEM Degree Attainment

University Corporation at Monterey Bay on behalf of California State University, Monterey Bay
100 Campus Center; Seaside, CA 93955

California State University, Monterey Bay's Research-based Interventions to Increase STEM Degree Attainment project will address the needs of Hispanic and low-income students in Science, Technology, Engineering, or Mathematics (STEM). The project will achieve four overarching goals: 1) Increase core courses and program completion, 2) Increase bachelor's degree attainment in STEM, 3) Strengthen Community College articulation and transfer services, and 4) Create system change and increased understanding of interventions that increase the retention and graduation of Hispanic and low-income students in STEM. To accomplish these goals, the project will:

- *Transform the first and second year experience* with revisions to gatekeeper course content and sequencing, thematic First-Year Seminar (FYS) courses that integrate foundational skillsets, linked learning communities, and tutoring and Supplemental Instruction (SI).
- *Increase the STEM identity of our students* through innovative course-based research, internships and undergraduate research, the development of 21st century skillsets, and the creation of lasting peer network structures.
- *Develop a transfer-receptive culture in STEM* with enhanced articulation, communication about majors and careers, counseling, and engagement opportunities for transfer students. These efforts will begin with Hartnell College, an HSI less than ten miles from our campus, then expand to three additional regional HSI community colleges.
- *Foster faculty development and communities of practice* that lead to systemic change.
- *Conduct research, which meets What Works Clearinghouse (WWC) evidence standards.* This research will lead to increased knowledge and understanding of the interventions that lead to increased graduation rates of Hispanic and low-income students in STEM.

The project interventions of first-year seminar courses and linked learning communities are supported by “moderate evidence of effectiveness” (Competitive Preference Priority 2), as is evident in the work by [Rutschow, Cullinan, and Welbeck \(2012\)](#), [Stephens, Hamedani, and Destin \(2014\)](#) and by studies in the WWC Intervention Report on Linked Learning Communities (2014). Curriculum enhancement through course-based undergraduate research experiences is also supported by research that would meet the WWC's standards of evaluation and evidence of effectiveness ([Russell & Weaver 2011](#)). Additionally, out of class, hands-on-learning including undergraduate research has also demonstrated significant impact in student success for traditionally underrepresented students ([Toven-Lindsey, Levis-Fitzgerald, Barber, & Hasson, 2015](#)).

The project is appropriately scaled to address the needs of our target population, create system change, and, importantly, result in statistically significant research results that are transferrable to other intuitions, particularly Hispanic Serving Institutions with large undergraduate populations.

Universidad del Este
Address: PO Box 2010, Carolina PR 00984-2010

PROJECT ABSTRACT

Universidad del Este (UNE) proposes a HSI-STEM and Articulation Program entitled “**Competency Development Approaches: Increasing STEM Awareness and Retention to Narrow the Achievement Gap of Hispanic Students**” to improve and expand our capacity to serve Hispanic and other low-income students. **The proposed Project addresses Absolute Priorities 1 and 2, and meets the Competitive Preference Priority 2 as indicated in 34 CFR 75.105(c)(2)(i).** The proposed project has been designed to address the needs of students in our region and help them to enroll, persist and complete degrees in STEM fields. Instituto Tecnológico de Puerto Rico-Manatí an eligible Hispanic Serving Institution, will serve as a collaborative partner and will participate in various aspects of the articulated activities. All proposed activities and student centered services, can be linked to positive academic outcomes. Researchers have confirmed that active, learner-centered instructional approaches are associated with enhanced learning. A seamless transfer articulation agreement will be developed with the ITEC-Manatí for a smooth transition between the college to the University. The goals and objectives are intended to provide better access and support services to Hispanic and other low-income students. The expected outcomes are: 1) Increase enrollment of full-time STEM fields degree seeking undergraduate students by 10%; 2) Increase retention of freshmen, sophomore and upper level STEM majors to at least 69.8%; 3) Increase STEM graduation rates by 5%; 4) Decrease by 10% failure rates for targeted STEM courses. 5) Increase access to student support services; 6) Develop, offer and monitor faculty development activities; 7) Strengthen the teaching and learning process; 8) Provide tutoring, advising, and supplemental instruction opportunities to students in general education and specialization courses; and 9) Establish a Seamless Transfer Model. The percentage of students who transfer from a 2-year institution will be increased by 10% over the grant period; and 10) The percentage of students who transfer from a UNE’s 2 year Engineering Program to a BS in Engineering and BS in Electronic Engineering Technology will be increased by 15% and 25%, respectively over the grant period. The Project addresses **Competitive Preference Priorities 2**. Proposed Pre-college Summer Immersion programs (US Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2015, March). WWC review of the report: *Does the offer of college counseling after high school mitigate summer melt among college-intending, low-income high school graduates?: Analysis of the Boston Program*. Retrieved from <http://whatworks.ed.gov>); Faculty and Peer Advising (Campbell, TA, & Campbell DE. (1997) *Faculty/student mentor program: Effects on academic performance and retention*. Research on Higher Education, 38(6), 727-742. Doi:10.1023/A:1024911904627 <http://whatworks.ed.gov>), and Undergraduate Research experiences Nagda BA, Gregerman SR, Jonides J, von Hippel W, & Lener J. (1998) *Undergraduate student faculty research partnerships affect student retention*. Review of Higher Education, 22(1), 55072 <http://whatworks.ed.gov>) are strategies supported by Moderate Evidence of Effectiveness that has been proven to help minority low-income, first-generation or individuals complete undergraduate education in STEM fields.

ABSTRACT: Caminos a Las Ciencias (CALC)

Saint Mary's College of California

1928 Saint Mary's Road | Moraga, CA 94575 | www.stmarys-ca.edu

Saint Mary's College of California (SMC) seeks a U.S. Department of Education Title III, Part F HSI STEM grant to significantly enhance and expand its curriculum and resources offered to Hispanic students and low-income students (HLI students). SMC is a comprehensive university serving 2763 (FTE) undergraduates and 781 (FTE) graduate and professional students. SMC received designation as an eligible Hispanic-Serving Institution under Federal Title V and Title III programs beginning July 1, 2015.

With HSI STEM funding, SMC will enhance services for HLI students through *Caminos a Las Ciencias (CALC): Pathways to Science*, a comprehensive, strengths-based project designed to yield improvements based on seven measures, all relating to STEM-degree seeking HLI students: first-year retention; six-year graduation; number of student participants; percent of participants successfully completing gateway courses; percent of participants in good academic standing; percent of transfer students on track to complete a STEM degree within three years of transfer; and graduation in a STEM major of all participants. SMC will also measure differences in perceived scientific identity and in campus climate. STEM disciplines at SMC are allied health sciences, biology, biochemistry, chemistry, earth and environmental science, math, and physics, with a secondary focus on psychology. Each year during the grant cycle, CALC will serve 91 first-year HLI students and 171 STEM majors, for a total of 262 HLI STEM students.

CALC pursues five interrelated paths, or strategies, to achieve its goals: 1) STEM Center, 2) Transfer Articulation and Support, 3) Faculty Development, 4) Curriculum Development, and 5) Ongoing Evaluation. Objectives were developed within a contextual framework that considers cognitive, non-cognitive, and climate/environmental factors. Services include tutoring, mentoring, career development, faculty workshops, curricular innovations such as flipped classroom and research-based courses, and qualitative and quantitative evaluation. SMC will partner with Los Medanos College, a two-year HSI, to develop STEM articulation agreements, advising materials, and partnership activities; create a working group of local HSIs; and pilot a transfer bridge and Transfer Year Cohort, services designed to improve HLI transfer students' STEM graduation rates.

SMC has addressed Competitive Preference Priority 2 by utilizing two studies to support how CALC will positively affect the target population's non-cognitive experiences and how CALC outlines pedagogical interventions, academic activities and strategies, and psychosocial supports that have demonstrated effectiveness when working with HLI students. SMC administrators and faculty used an evidence-based approach to design CALC. They will continue to improve it using evaluation results as well as emerging research: 1) **Lee, A., Poch, R., & Shaw, M. (2012).** *Special issue: Engaging diversity in undergraduate classrooms: A pedagogy for developing intercultural competence.* ASHE Higher Education Report, v38 n2 p1-132 2012.

(2012), <http://onlinelibrary.wiley.com/doi/10.1002/aehe.v38.2/issuetoc> and

2) **Stephens, N.M., Hamedani, M.G., & Destin, M. (2014).** *Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition.* Psychological Science.

<http://www.psychology.northwestern.edu/documents/destin-achievement.pdf>

ABSTRACT

Applicant:

San Diego Mesa College
7250 Mesa College Drive
San Diego, CA 92111

San Diego Mesa College is proposing for this Title III Part F grant competition STEM Conexiones. The project will develop and implement a variety of supportive services for STEM students and faculty at this Hispanic Serving Institution in San Diego, Calif., including mentoring, access to state-of-the-art facilities and improved teaching through professional development. The project will be done through three distinct components: Student Connections, Faculty Connections and Pathways. The population to be served are the Hispanic and low-income students attending the institution. A total of \$5,043,486 is requested over the five-year period to successfully implement STEM Conexiones.

The overall goal of the project is to improve STEM student success by developing support services for students. The objectives to meet the goal are:

Objective 1: By Sept. 30, 2021, the number of Hispanic and low-income full-time STEM field degree-seeking undergraduate students enrolled at SD Mesa will increase by 20%.
Objective 2: By Sept. 30, 2021, the percentage of Hispanic and low-income first-time, full-time STEM field degree-seeking undergraduate students who were in their first year of postsecondary enrollment in the previous year and are enrolled in the current year who remain in a STEM field degree/credential program will increase by 10%.
Objective 3: By Sept. 30, 2021, the percentage of Hispanic and low-income STEM majors at San Diego Mesa transferring successfully to a four-year institution will increase by 10%.
Objective 4: By Sept. 30, 2021, The percent of Hispanic and low-income students who participated in grant-supported services or programs who successfully completed STEM gateway courses will be at 70%.
Objective 5: By Sept. 30, 2021, The percent of Hispanic and low-income students who participated in grant-supported services or programs in good academic standing will be at 60%.

To ensure success through this project, San Diego Mesa will partner with the University of California San Diego, San Diego State University and the University of San Diego.

San Diego Mesa is responding to Competitive Preference Priority 2. The studies being used for this are:

- “The Effects of Student Coaching in College: An Evaluation of a Randomized Experiment in Student Mentoring” by Eric Bettinger and Rachel Baker, found at the following link: https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf
- “Increasing Persistence in Undergraduate Science Majors: A Model for Institutional Support of Underrepresented Students” By B. Toven-Lindsey, M. Levis-Fitzgerald, P.H. Barber and T. Hasson, found at the following link: <http://www.lifescied.org/content/14/2/ar12.full>

An Articulated State College-University Framework For Increasing Graduation Rates of Hispanic and Low-income Students in Computer Science

Abstract

This project will involve a multi-faceted collaboration between two large, 2-year state colleges (Broward (FL) College - 68,000 students and Palm Beach State (FL) College - 49,000 students) and the College of Engineering and Computer Science at the 4-year Florida Atlantic University. The overall project objective is to increase the number of degrees awarded to Hispanic and low-income students in the areas of Computer Science (CS), Computer Engineering and Electrical Engineering (CS for simplicity), and, upon graduation, to facilitate the rate of successful student post-degree CS/STEM employment or graduate school enrollment in CS.

Absolute Priority 1. An intermediate project objective is to increase student success rate in passing three lower-division (years 1-2) and two upper-division (years 3-4) gateway courses (Algebra, Calculus, Introduction to Programming in C, Foundations of Computer Science, Introduction to Logic Design) which are requirements for completion of the CS degree. The project intervention consists of three components. The first is the curricular analysis/ refinement of the five key gateway courses whose high failure rates serve as barriers to students entering or remaining in CS programs. The second is providing student academic support facilitating course mastery through course-specific, mentor-led peer learning teams and concurrent development of student proficiency in self-regulated learning skills that allow them to become more effective independent learners in their future CS courses. The third provides motivational support through a Computer Learning Community which includes presentations by industry partners and faculty in order to amplify student awareness of opportunities and interests associated with CS degrees.

Absolute Priority 2. The project Articulation and Transfer Model will coordinate the collaborative intervention and recruitment activities to be implemented by the three institutions. The Articulation Model is a key component because of the project's focus on facilitating the success of students who begin their CS degrees at 2-year state colleges and then transfer as Juniors/Seniors to the 4-year university where the CS degree is offered. The project will document the Articulation Model in a form that is transportable to other settings and validate its effectiveness in increasing the graduation rates in CS of the Hispanic and low-income students. These outcomes address and contribute to issues of institutional policy and practice.

Competitive Preference Priority 2. The relevant literature cited addresses both the theoretical and conceptual background in terms of an interdisciplinary framework. With this in mind, a study by Scrivener et al. (2015) (http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf) is both relevant to the present intervention and has been designated as meeting What Works Clearinghouse WWC 3.0 Standards Without Reservations (see- <http://ies.ed.gov/ncee/wwc/quickreview.aspx?sid=20155>).

Evaluation Design. The evaluation plan will include assessing the effectiveness of the project by comparing the academic success of (N=500) project participants vs. comparison students in meeting its major objectives and has been designed to meet WWC 3.0 Standards with Reservations.

Abstract – Sacramento City College STEM Equity and Success Initiative (SESI)

The STEM Equity and Success Initiative (SESI) is a comprehensive, multifaceted program intended to increase the participation and success rates of Hispanic and low-income students in STEM fields and careers. It addresses key challenges, as identified in educational research, experienced by underrepresented minorities (URM) in STEM training. The project will be located in Sacramento, California’s capital city, and serve that community as well as much of the central California valley from which Sacramento City College’s students are drawn.

The overall objective of the SESI project is to increase the number of Hispanic students and other low-income students who enter into and complete educational opportunities in STEM fields of study, and to develop model programs for Hispanic and low-income students’ successful degree completion and transfer from two-year HSIs to four-year institutions in STEM fields of study. The two primary goals are as follows:

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|---|
| 1. By September 2021, the number of STEM degrees and certificates completed annually by Hispanic and low-income students will have increased from 198 to 243 (a 23% increase). |
| 2. By 2021, there will be a 50% percent increase in the number of Hispanic STEM students transferring to a CSU campus, an increase from a three year average of 22 per year to 33 per year. |

SESI project plans parallel the elements of City University of New York’s Accelerate Study in Associate Programs (ASAP) initiative but are contextualized to the issues particular to URM in STEM. The case management approach of the project will extend from first contact to graduation or transfer and includes the following: targeted outreach within the Hispanic community, multi-measure assessment of current STEM acumen, a summer transition program, individualized and proactive counseling and advising, individualized education plans for participants, learning community courses and general education courses linked through authentic, hands-on STEM-related assignments, peer mentors and tutors, curriculum revision, and professional development for faculty, staff, and administrators through a professional learning community structure. The ASAP project provided solid evidence that a multifaceted approach to student success can produce dramatic results for students (increased numbers completing developmental education, persisting semester to semester, experiencing academic success, and graduating in three years [Scrivener et al, 2015]). It is anticipated that the SESI project will produce similar outcomes for Hispanic and low-income students of the central California valley. The primary partnering institutions for transfer programming are The University of California at Davis and California State University at Sacramento.

The study utilize in project planning, cited in evidence for the project, and employed as the basis of the Competitive Preference Priority statement addressing priority #2, moderate evidence of effectiveness is:

Scrivener, S., Weiss, M. J., Ratledge, A., Rudd, T., Sommo, C., & Fresques, H. (2015). Doubling graduation rates: three-year effects of CUNY’s Accelerated Study in Associate Programs (ASAP) for developmental students. New York: MDRC. (Full study on the MDRC website: http://www.mdrc.org/sites/default/files/doubling_graduation_rates_fr.pdf and the WWC listing at <http://ies.ed.gov/ncee/wwc/quickreview.aspx?sid=20155>).

Institution’s Address

Sacramento City College
3835 Freeport Blvd.
Sacramento, California 95822

PROJECT: *STEM Guided Pathways and Transformational Teaching Practices*

Cuyamaca College (El Cajon, California) is one of two public, two-year colleges in the Grossmont-Cuyamaca Community College District in San Diego East County. Sharing 40 miles of international border with Mexico, the County has a diverse population of 427,711 residents (59% White, 26% Hispanic, 15% Other). During Fall 2015, among 9,144 students enrolled, about one-third (30%) were Hispanic and almost half of first-entering students were low-income (49%). Among first-entering Hispanic students, almost half (48%) were first-generation college.

The Project Design proposes student-centered, research-based interventions to promote increased STEM participation, academic success and persistence to degree and transfer for both Hispanic and low-income students. The interventions will be designed as research experiments following What Works Clearinghouse standards, comparing treatment and matched comparison control groups, to verify that outcomes are statistically significant.

STEM Guided Pathways and Support: *Pre-Fall STEM Guided Pathways* summer boot camp will target a first-entering cohort of first-generation and academically at-risk students each year of the project, prior to the students' first fall of coursework to build study skills, strengthen basic competencies, and provide hands-on research activities and mentoring. *STEM Guided Pathways Success Courses* for first entering STEM majors will be contextualized by STEM discipline with the goal of reinforcing learning objectives in specific STEM fields. *STEM Student Coaching* will support degree completion and transfer by providing individualized mentoring services for a first-entering cohort of STEM majors each year they progress through their studies to completion. ***STEM Model Articulation and Transfer*** supports increased STEM participation and transfer to four-year STEM programs of study. The College will articulate seven Associate Degrees for Transfer with partner transfer institutions: California State University system and University of California San Diego. Also, STEM transfer activities will immerse STEM majors in a four-year college experience at the partner articulation institutions, including visits to campuses for transfer information and guidance and authentic lab research activities and mentoring.

STEM Transformational Teaching and Learning will provide faculty training for adopting effective teaching practices and provide students supplemental support (embedding learning assistants in high-risk courses) to address low academic performance and retention. New STEM learning spaces and resources will support active learning and course-based authentic research.

Absolute Priorities: All three Project components have student-centered interventions for improving success and STEM degree completion and transfer to four-year institutions.

Competitive Preference Priority #2: The STEM Student Coaching intervention is modeled on a random-control trial reviewed in Bettinger, E. P., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring* (Stanford University, Working Paper No. 16881). <http://www.nber.org/papers/w16881>.

ABSTRACT

University of Texas-El Paso (UTEP) and El Paso Community College (EPCC)
500 W. University Avenue, El Paso, TX 79968
915-747-5680 (orsp@utep.edu)

Project Title: STEMGROW Program

The **STEMGROW Program** is a STEM pathway initiative tailored to the needs of Hispanic, low income, minority, and first generation students, and driven by a commitment from faculty, students, and parents, to ensure that students graduate with STEM degrees and pursue STEM careers. The partnership is between the University of Texas-El Paso (UTEP-23,397 students), and El Paso Community College (EPCC-29,676 students). Both are public, urban, Hispanic Serving Institutions (HSIs) with high enrollments of minorities (UTEP-87.5%; and EPCC-91%).

While in the most recent year (2014-15) students with EPCC transfer credit constituted 74% of all UTEP graduates, within STEM fields the EPCC transfer is much more limited, with EPCC only contributing 26% of UTEP STEM graduates. The largest fraction of STEM student enrollees at EPCC is in fields of Biological, and Engineering Sciences (81%), with attrition in Biology (29%) and Engineering Sciences (24%) and growing. EPCC's 10% 3-year graduation rate, and UTEP's 35% 6-year graduation rate, for STEM major students indicates a major problem that needs an urgent solution. It is thus imperative for us to address this need: focusing together on increasing minority and low-income student growth rates in retention, transfer between, and graduations from EPCC to UTEP, in the major fields of Biology and Engineering, which is the central focus of our STEMGROW Program. The program is rooted in a co-curricular research-to-practice logic model.

The STEMGROW Program uses the conceptual and operational frameworks or major elements of the CUNY's Accelerated Study in Associate Programs (ASAP), recently evaluated by MDRC, and assessed by WWC as meeting "*WWC group design standards without reservations*" (May 2015).

HSI STEM Competition: Abstract

Project title: Increasing Latin@s Access to Networks for Advancement in Science

Population to be served, goals, and expected outcomes: The Latin@s Gaining Access to Networks for Advancement in Science (L@S GANAS) program at the University of Illinois at Chicago (UIC) will support Latin@ undergraduates who have an interest in STEM fields. The L@S GANAS program will support the whole student—both their strong ties to their heritage as Latin@s as well as their emerging identities as scientists. The two overarching goals for the L@S GANAS program will be to: (1) improve outcomes for Latin@ STEM students, including academic performance as well as persistence and graduation rates; and (2) increase enrollment of Latin@ STEM students. In order to achieve these goals, we will expand our recruitment efforts and pilot an innovative program that includes five evidence-based components: (a) opportunities for students to engage in undergraduate research with faculty mentors; (b) holistic supports and advising for students; (c) supportive networks of faculty and peers; (d) active and collaborative learning opportunities in STEM courses; and (e) financial support.

Absolute Priority 2 proposed partner institution: City Colleges of Chicago, Malcolm X campus

Competitive preference priority 2 citations: Full references available in the “Other Attachments” file (Abelman & Molina, 2001; Campbell & Campbell, 1997; Castleman & Long, 2013; Moon, Hershey, & McMahan, n.d.; Nagda, Gregerman, Jonides, von Hippel, & Lerner, 1998; Stephens, Hamedani, & Destin, 2014).

Abstract

Project CREST (CoenRollmEnt for STem) will serve students in the large urban area of Chicago, Illinois focusing specifically on the city itself and the suburban town of Cicero, Illinois. Chicago has a Hispanic population of 21.5%, and the great majority, 89.6%, of Cicero's population is Hispanic. In Cicero, only 10% of the adult population over 25 has completed a bachelors, so that many of the students served through CREST will be first generation college attendees and completers.

National Louis University and Morton Community College are partnering to deliver a comprehensive set of services designed to create systemic change at the levels of institutional curricular offerings, student services, and faculty capacity for effective support of Hispanic students in STEM. The services include enhanced recruitment into STEM programs, with recruitment reaching into the community and within current community college students; a clearly defined, vertical co-enrollment curricular pathway in Computer Information Sciences (CIS); intensive student support services coordinated between the two partners and using the approaches of appreciative advising and culturally responsiveness; tutoring services specifically focused on STEM; summer bridge experiences using a cultural sustainability model to develop students' identity and capacity as academic readers and writers, and professional development for faculty and staff on serving students of color.

The project activities will include intensive recruitment into STEM programs; the development of the CIS vertical co-enrollment program, the hiring of a success coach to coordinate support services across the two partners, the delivery of tutoring and a summer bridge program, and the delivery of professional development workshops for faculty and staff. With this comprehensive approach, CREST expects to reach the following goals:

- ❖ Goal 1: Increase enrollment of Hispanic students into computer science degree pathways by 20% at Morton and to a total of 60 at NLU to result in 100 students enrolled in the B.S. in Computer Information Sciences by Year 5
- ❖ Goal 2: Increase retention and graduation. *Sub-Goal 2a: Increase year-to-year student retention to 80% in computer information science degree pathways at community colleges and NLU and Sub-Goal 2b: Increase graduation rates to 80% within 3 years at community colleges*
- ❖ Goal 3: Increase faculty and staff understanding and use of culturally relevant teaching and coaching strategies by 20%.

Citations supporting Competitive Preference Priority 2:

Wang, X. x., & Wickersham, K. (2014). Postsecondary co-enrollment and baccalaureate completion: A look at both beginning 4-Year college students and baccalaureate aspirants beginning at community colleges. *Research In Higher Education*, 55(2), 166-195. doi:10.1007/s11162-013-9317-4.

Stern, J. B. (2016). The effect of articulation agreements on community college transfers and bachelor's degree attainment. *Community College Journal Of Research & Practice*, 40(5), 355-369. doi:10.1080/10668926.2015.1065209

Scrivener, S., & Weiss, M. J. (2009, August). *More guidance, better results?: Three-year effects of an enhanced student services program at two community colleges*. New York: MDRC. Retrieved from <http://www.mdrc.org/publication/more-guidance-better-results>

PROJECT ABSTRACT
University of Houston-Clear Lake
STEM Career Pathways: A University-Community College-Industry Partnership

In response to Absolute Priorities 1 and 2 of the U.S. Department of Education's Hispanic Serving Institution STEM and Articulation program, the University of Houston-Clear Lake (UHCL) aims to increase the number of Hispanic and other low-income students attaining degrees in STEM fields. The main goals of the project are to increase attainment of STEM degrees through student service programs focusing on academic success, as well as to develop model transfer and articulation agreements to facilitate and increase the transfer of STEM students. Supporting initiatives will include the creation of a learning community which will increase student engagement and persistence through the development of face-to-face and technology-enhanced learning networks. To further prepare students for a successful future in STEM fields, this project also proposes the creation of a Computer Science 7-12 Teacher Certification degree plan to place more role models in the classroom with expertise in computer science to prepare the next generation.

In response to Competitive Preference Priority 2, the primary activities selected for this project are based on research that meets the "moderate evidence of effectiveness": Sommo, C., Mayer, A.K., Rudd, T., & Cullinan, D. (2012). Commencement day: Six-year effects of a freshman learning community program at Kingsborough Community College. New York: MDRC. Retrieved from <http://www.mdrc.org> and Weissman, E., Butcher, K. F., Schneider, E., Teres, J., Collado, H., Greenberg, D., & Welbeck, R. (2011). Learning communities for students in developmental math: Impact studies at Queensborough and Houston Community Colleges. New York: National Center for Postsecondary Research. <http://files.eric.ed.gov/fulltext/ED516646.pdf>.

Abstract for Amarillo College's Engaging in STEM Project
Amarillo College 2201 S. Washington St, Amarillo, TX 79109

Amarillo College (AC), in Amarillo, Texas, is a Hispanic-Serving, public, open-door, comprehensive community college located in the center of the vast *Texas Panhandle*. AC serves a 9-county, 9,363 square-mile primarily rural service area, with most of its 310,000 residents concentrated around Amarillo (pop. 196,429), the largest city in a 120-mile radius. AC is the largest college in the area with four city sites, two branch campuses, and outreach centers to extend postsecondary educational access throughout the region. Residents in AC's service area have per capita incomes (avg. \$23,356) 16.6% lower than that of the U.S. (avg. \$28,184). In Amarillo, 17.4% of all residents live in poverty, compared to 15.4% nationally. Bachelor degree levels (adults age 25+) within the region are low (21%), lagging below those of Texas (27%) and the U.S. (29%). Disadvantage is even greater among the area's Hispanic population; only 7% of Hispanic adults (age 25+) have completed a bachelor's degree, and more than one in four (27%) service area Hispanic residents live in poverty. Mirroring the demographics of our service area, AC students are high need: of Fall 2015 students, 38% were Hispanic; 74% are first-generation college students (77% of Hispanic students); 70% enroll part-time; and 86% come from homes with incomes low enough to make them Pell Grant –eligible (91% for Hispanic students).

Even as an increasing number of AC students seek STEM majors, institutional gaps and weaknesses, including limited STEM programs, insufficient support, and inadequate STEM facilities and resources, are keeping AC from meeting the needs of its target population.

AC's proposed project includes several initiatives in support of two project goals:

Goal 1: Increase access to and participation in STEM degree pathways.

- ✓ Develop new certificate and transferable associate of science (AS) options: Certificate and AS in Horticulture; AS in Environmental Science, AS in Plant Biotechnology, AS in Sustainable Resources, articulated for transfer to Texas Tech University STEM programs
 - ✓ Modify key curricula in Engineering (ENG), Biology (BIOL), and Chemistry (CHEM) to incorporate research and project-based learning
 - ✓ Provide Summer Research opportunities for high school graduates and AC STEM majors
- Goal 2: Increase Hispanic and low-income student transfer to baccalaureate degree programs in STEM*

- ✓ Develop/pilot STEM pathway advising
- ✓ Develop/pilot STEM mentoring system
- ✓ Develop/pilot STEM internships
- ✓ Develop articulation agreements for new AS degree programs with Texas Tech University

AC's project addresses both Absolute Priority 1 and 2. AC is also responding to Competitive Preference Priority 2, citing the following study: *The Effects of Student Coaching in College: an Evaluation of a Randomized Experiment in Student Mentoring*, Bettinger and Baker (2011) available at https://ed.stanford.edu/sites/default/files/bettinger_baker_030711.pdf

By the end of the project, AC expects to see increases in the number of STEM majors, the number of STEM degrees awarded within three years of enrollment, and the number of students transferring to baccalaureate STEM degree programs within three years of enrollment.

Year 1 Budget Request: \$994,819

ABSTRACT

New Mexico Highlands University (NMHU), established in 1893, is a leading academic, cultural, and economic institution across the rural and small town communities of northern New Mexico (NM). NMHU is designated as a Hispanic Serving Institution (HSI) since the 1960s and prides itself on providing an affordable, accessible education to populations that have traditionally been underserved in higher education.

The target population to be served utilizing **STEMfast** initiatives is Hispanic, low-income and full-time STEM field majors and secondary mathematics education degree seeking undergraduate students enrolled at NMHU and those transferring from partner institutions. Over the past decade, the College has expanded its services to this population. In fall 2013, over 70% of NMHU undergraduates were identified as underrepresented groups including Hispanics (56%), American Indians (7%) and African Americans (7%). Other demographic data show that NMHU undergraduates are an educationally inexperienced population of which 53.3% are first generation, and 60% low income NM residents.

Hayward and Willett's (2014) findings demonstrated that statewide efforts to train community college faculty to offer redesigned, accelerated pathways in English and math that decreased time in remedial instruction significantly impacted completion rates for college-level gateway courses for all students assigned to remedial courses. Since this intervention meets Moderate standards, in terms of impacting outcomes in developmental math and English for disadvantaged community college students, **STEMfast** will use this model to increase the number of Hispanic and low-income students (traditional and transfers) who graduate with STEM degrees and in secondary mathematics education. Stephens, Hamedani and Destin (2014) also found such strategies to be effective for closing achievement gaps for disadvantaged students. Therefore, NMHU **STEMfast** is proposing two primary activities:

Activity One is designed address Absolute Priority 1, which aims to significantly increase the quality of teaching and learning in STEM and secondary mathematics education courses for Hispanic and low-income undergraduate students in the following ways: **(a)** increasing student support through developmentally appropriate concrete learning and inquiry-based instruction; **(b)** implementing a series of faculty development services to STEM, English, and secondary education faculty encouraging the use of best practices found to impact students' content and pedagogical knowledge in STEM, English, and secondary mathematics education; and **(c)** updating software, textbooks, laboratories and instructional equipment to enhance STEM, secondary math education, and English language learning.

Activity Two is designed to address Absolute Priority 2, and aims to improve student transfer, retention, graduation rates through: **(a)** developing a Highlands University Center for Academic Quality Coordinator position to bridge a connection to all NMHU student services offices; **(b)** implementing a PLATO, self-paced mathematics software modules that will be connected seamlessly to four existing NMHU mathematics courses to provide self-paced developmental math lab instruction; **(c)** peer tutoring services through the existing NMHU ARMAS Tutoring Office; **(d)** dual enrollment agreement with two community colleges; **(e)** restructuring four existing mathematics courses to include developmental mathematics components; and **(f)** enhancing ENG 111 and 112 to provide instructional support to English Language Learners.

ABSTRACT

East Los Angeles College, Monterey Park, California

- GOALS:** The goals of *Jardin de STEM* are: (a) to support rapid completion of remedial coursework; (b) help Hispanic, low-income and first-generation students navigate college decisions; (c) develop a supportive summer academy and cohort design to accelerate progress through the initial year of STEM study; and (d) deliver sustainable pathways for STEM careers for Hispanic students.
- EXPECTED OUTCOMES** Academic and non-academic outcomes are anticipated. Year One focus is on preparing 80 new students to succeed in transfer-level math courses, and become calculus-ready in a single year. Activities: (a) Supplemental Instruction (a well-documented group tutoring method); (b) a cohort-based accelerated sequence of math courses (c) peer counseling to support students' cognitive and non-cognitive challenges. (d) a counselor to work exclusively with STEM students: (e) a Coding Academy to present modeling, machine languages and problem-solving using computer code; (f) training in Reading Apprenticeship, a strategy to reinforce students' comprehension of difficult texts and writing assignments; and (f) an Aquaponics lab, built and maintained by students, used as a thematic core in all STEM disciplines to teach the biology, chemistry and physics of food science. Two years of intensive coursework will culminate in research at major research laboratories in the region, and workshops to help students navigate the complex process of transfer to a four-year university.
- CONTRIBUTIONS FOR RESEARCH AND PRACTICE** The project will contribute to knowledge of challenges that affect postsecondary education of Hispanic and low-income students—specifically to practices that benefit those who struggle in STEM courses. Research confirms that enrollments and transfers to undergraduate STEM majors are growing, and that many who transition from two-year to four-year institutions experience “transfer shock.” Project staff will report the results of *Jardin de STEM* in publications and at conferences, to ensure that effective practices will be replicated in other colleges whose student profiles similar to East Los Angeles College.
- TARGET POPULATION** East Los Angeles College (ELAC) has the largest Hispanic enrollment in California; 80% of the 28,673 credit students are Latino/a. Approximately 2,000 students per term are enrolled in STEM classes; 75% (1,500) are Hispanic. About 300 high-achieving STEM students belong to an organization (MESA) that provides services to transfer students. The *Jardin de STEM* project targets students who are interested in STEM, have strong potential, but lack confidence in their ability to succeed, or a clear pathway toward a STEM career.

ABSTRACT

Los Angeles City College is partnering with its feeder high schools and the California State University, Los Angeles (CSULA) to implement the **STEM Pathways Program**. The program will develop a robust STEM pipeline and transfer culture and achieve the following goals:

1. Increase the number and percentage of Hispanic and other low-income students attaining certificates and degrees in science, technology, engineering, and mathematics (STEM);
2. Increase the number and percentage of Hispanic and other low-income students who complete a certificate and/or degree in STEM within two years; and
3. Increase the number and percentage of Hispanic and other low-income students transferring to baccalaureate programs in STEM.

STEM Pathways has developed a student-centered program that addresses Absolute Priorities 1 and 2 and incorporates strategies that have been identified by research to increase success among underrepresented students. Strategies that meet the What Works Clearinghouse (WWC) Moderate Evidence of Effectiveness standard (Competitive Preference Priority 2) are cited below.

1. Math Preparation and Support – The program will provide an accelerated math pathway for STEM majors, math summer bootcamps and tutoring, as well as instruction at high schools to promote rapid progression and completion of college-level math and core STEM courses.
2. Peer-Led Team Learning – The program will establish a *STEM Learning Center* to provide centralized resources to participants, including peer facilitated study groups, tutoring, and supplemental instruction in STEM gateway courses.
3. STEM-Specific Individualized Counseling and Peer Mentoring – A dedicated STEM Counselor and Peer Mentors will develop and monitor individual education plans, provide transfer activities, and academic and nonacademic support to promote success. Studies have shown that students who receive peer advising coupled with professional counseling are more likely to persist and graduate (Bettinger, E. P., & Baker, R. (2011) – meets WWC’s evidence standards without reservations (<http://ies.ed.gov/ncee/wwc/SingleStudyReview.aspx?sid=179>).
4. Faculty Mentoring – Faculty Mentors will provide discipline-specific guidance and STEM exposure activities (STEM Workshop/Speaker Series, field trips, professional networks).
5. Early Undergraduate Research Experiences – Students will have access to course-based and summer research experiences. Research indicates that students who take part in early undergraduate research are more likely to transfer and attain degrees in STEM.
6. STEM Fast Track to Baccalaureate – High school students will take prescribed college courses, participate in STEM exposure activities, and have access to undergraduate research opportunities. Studies have shown that dual enrollment significantly increases the likelihood of attaining college degrees (An, B. P. (2012) - meets WWC’s evidence standards with reservations (<http://ies.ed.gov/ncee/wwc/singlestudyreview.aspx?sid=20004>).
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