

Project Abstracts for Fiscal Year 2023

Minority Science and Engineering Improvement Program

New Awards

FY 2023 MSEIP PROJECT ABSTRACTS (ORGANIZED IN STATE ORDER)

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CA - California State University, Dominguez Hills Foundation

Carson, CA

P120A230072

Enhancing Student Success at CSUDH: Scaling up the VR Initiative to Address High DFW Rates, Underrepresentation, and Commuter Challenges

Abstract

This proposal aims to revolutionize STEM education by harnessing the power of Virtual Reality (VR) technology to create immersive and interactive learning experiences. The program focuses on increasing access, affordability, and success in postsecondary education for underserved students, with a specific emphasis on science, technology, engineering, and mathematics (STEM) disciplines. Additionally, the proposal aims to utilize VR technology as a transformative tool in STEM education, with a focus on addressing the challenges of Disproportionate Withdrawal, Failure, and low grades (DFW rates), retention, and graduation rates among Underrepresented Minority (URM) students, while also addressing the financial burden faced by commuting students. By integrating VR into the curriculum, the proposal seeks to enhance student engagement, foster critical thinking, and develop essential skills for success in the workforce and civic life.

The program encompasses various components, including student assistant training in VR development, the creation of 3D objects based on physics concepts, faculty immersion training in VR teaching methodologies, and the implementation of VR in new courses across disciplines. URMs and women High school students are actively engaged through a Saturday program and a summer program that focuses on STEM VR development and coding, showcasing diverse STEM career paths that utilize VR technology. To promote inclusivity and address the financial burden faced by URMs and women commuting students provide paid tutoring and assistantships.

The evaluation plan incorporates formative and summative assessments to measure the impact of VR on student learning, faculty training, and program scalability. Assessment methods include student and faculty feedback surveys, performance metrics compared to traditional teaching methods, and evaluation reports on the effectiveness of VR use in courses. Additionally, the plan evaluates the program's impact on diversity, equity, and inclusion, ensuring equitable access and representation in STEM education.

The proposed program aligns with the competitive preference priority of increasing postsecondary education access, affordability, completion, and success for underserved students. By leveraging VR technology, the program provides high-quality and accessible learning opportunities, develops evidence-based strategies for workforce readiness, and offers career exploration and advising to secondary school students. The immersive and experiential nature of VR empowers students to explore complex scientific concepts, enhances their understanding, and prepares them for future STEM careers.

This proposal presents a transformative approach to STEM education, where VR technology serves as a catalyst for student engagement, skill development, and career exploration.

Through collaborative efforts, rigorous evaluation, and a focus on equity, the program aims to make significant contributions to science education and empower underserved students with the knowledge and skills to thrive in the dynamic STEM fields of the future.

CA - Pasadena Area Community College District

Pasadena, CA

Institutional Grant

P120A230064

VOICES in STEM

Abstract

Critical and social justice approaches to STEM education have the potential to effect transformative social change and broaden participation in STEM career paths among racially minoritized groups, but they have not been widely enacted by STEM educators. To increase recruitment and improve transfer rates of PCC underrepresented minority (URM) STEM students, the VOICES (Voices Opposing Injustice through Community-Engaged Scholarship) in STEM program will increase experiential community-engaged learning opportunities for URM STEM students in and out of classes through establishment of a social/environmental justice-themed STEM transfer pathway from Pasadena City College to Cal State LA. This transfer pathway is implemented through: 1) Targeted outreach to Pasadena high school students, 2) Implementation of community-engaged (CE) pedagogies in courses at PCC and Cal State LA. 3) Community-engaged learning and research opportunities supported by partnerships with Cal State LA and community organizations. This program will create a model for the transformative integration of social and environmental justice themes and community engagement into STEM courses, with the ultimate goal of increasing the enrollment, retention, transfer and degree completion of underrepresented minority students in STEM programs at PCC. Through the creation of an environmental and social justice-themed transfer pathway consisting of a culturally-relevant, community-engaged curriculum and outreach and internship opportunities for high school and college students, VOICES in STEM will address the following priority areas of **Competitive Preference Priority 1**: (a) Supporting the development and implementation of high-quality and accessible learning opportunities, including learning opportunities that are accelerated or hybrid online, credit-bearing, work-based, and flexible for working students. (b) Supporting the development and implementation of evidence-based strategies to promote students' development of knowledge and skills necessary for success in the workforce and civic life. (c) Providing secondary school students with access to career exploration and advising opportunities to help students make informed decisions about their postsecondary enrollment decisions and to place them on a career path.

CA - Riverside Community College District/Moreno Valley College
Moreno Valley, CA
Institutional Grant
P120A230080

The Moreno Valley College Minority Science and Engineering Improvement Program

Abstract

Moreno Valley College (MVC) is located in the city of Moreno Valley, which is in the northwestern corner of Riverside County, California and approximately 67 miles east of Los Angeles. Latinx/Hispanic students make up the largest proportion of the student population at 64%. This population has experienced the largest growth since the college's last accreditation report in 2013-14, when they comprised 54%. While student enrollment reflects the diversity of the region, MVC's faculty and staff are disproportionately white and not representative of the community it serves, which presents challenges as the college works to develop high quality culturally relevant programming in STEM.

While student enrollment in STEM has generally increased over the past five years, current enrollment does not meet industry and workforce demands. In 2022, only 39% of all incoming students enrolled in STEM pathways. Of those enrolled in STEM, 88% were minority students and 61% were female, demonstrating a strong interest by student groups traditionally underrepresented in STEM. However, student success rates in Computer Science, Biology, Physics, Chemistry and Math were only 62.2% as compared to the overall College success rate of 69.8%. Furthermore, minority females are lagging males in student success for STEM pathways, at a rate of 61.9%, as compared to 63.9% for males.

In order to increase enrollment, persistence, success, and completion rates for minority STEM students, especially minority females, MVC will strengthen its efforts to foster enthusiasm and interest among students, increase supports to enable students to succeed, and improve the student experience in STEM pathways. MVC will work collaboratively with the local K-12 districts as well as California State University San Bernardino to develop STEM pathways from K-12 to community college to university that integrate instructional and student support services, leverage other efforts to improve student success, including the nationally recognized Guided Pathways model, and yield long-lasting sustainable improvement in science education.

Specifically, this project will:

1. Establish inter-system faculty-based Communities of Practice in STEM that include K- 12, community college, and university faculty;
2. Develop a STEM-focused Summer Bridge Program for new students;
3. Foster a sense of belongingness and inclusion for minority students;
4. Strengthen the connection between the classroom and the STEM Engagement Center through faculty mentoring and advising;
5. Connect STEM to real world problems through applied learning activities both in and out of the classroom; and
6. Provide faculty with the skills to develop antiracist and social justice pedagogy.

MVC's MSEIP project will address both Competitive Preference Priorities. First, this project will address all three components of Competitive Preference Priority 1 to increase postsecondary education access, affordability, completion, and post-enrollment success through the development of high quality, evidence-

based pathways that are accessible, flexible, and coordinated with K-12 and university systems. Second, MVC has not received a MSEIP grant in the past and is therefore eligible for Competitive Preference Priority 2.

DC - **Howard University**
Washington, DC
Special Grant
P120A230007

Integrating Leadership Education and Development (I-LEAD) into the Minority STEM Education

Abstract

This Special Project grant proposal aims to Integrate Leadership Education and Development (I- LEAD) into the undergraduate STEM education of minority and women students at Howard University (HU) for producing future leaders in the STEM workplace. The integration will be achieved through instruction of leadership, business, and management modules in a hybrid online setting followed by integrated leadership development activities.

In the instructional activities, students will learn business essentials and analytics, leadership principles and human resource management that are critical for readiness and success as leaders in STEM fields. The educational training will be followed by leadership development activities including team-based leadership case studies, community service roles, and secondary school outreach activities. Upon completion of educational and development activities, a STEM Leadership Certificate will be issued for the students. Black/African Americans and women are extremely and severely underrepresented in leadership roles in the STEM fields. Producing graduates that can address the inequity of minority representation in STEM leadership is the final goal of this project. The project addresses competitive priority 1 by promoting underserved post- secondary students' access, completion, and professional and academic success. The I-LEAD project aims to train 102 undergraduate students in STEM and the measurable objective are:

- i. The participants will acquire knowledge in business, management, and leadership, which are not otherwise acquired in the current STEM educational experience.
- ii. The participants will practice business decision making and leadership in case studies, research, and other leadership development activities.
- iii. The participants will receive academic mentorship and networking opportunities with industry partners for academic and professional success.

FL - **Bethune-Cookman University, Inc.**
Daytona Beach, FL
Institutional Grant
P120A230009

**MSSEIP: Integrating Machine Learning Mathematical Modeling and Data Science into Robotics
Education and Research**

Abstract

This project addresses two identified needs in targeted STEM disciplines at Bethune-Cookman University (B-CU), a Historically Black University (HBCU): 1) Maintaining and/or increasing the number of minority students, including minority women; and 2) better preparing, retaining, and graduating STEM minority students, including minority women. The proposed program activities will address the two identified needs as well as the Competitive Preference Priority 1 and 2 defined in MSEIP by implementing the Proposed Activities aimed to enhance the learning experiences and outcomes of underrepresented minority students at B-CU. The proposed educational component will be strongly supported by research in Robotics, and student participation in research will be used as an effective teaching practice to reinforce the proposed curricula enhancement. Research results will be integrated into the science and engineering curricula through in-class demonstrations, laboratory experiments, and independent capstone projects. These integrated research and educational efforts will establish a state-of-the-art robotics research capability at B-CU, improve the quality of students' preparation for careers in STEM fields, promote opportunities for recruiting and retaining B-CU's minority students through technologically enhanced curricula, and increase the flow of minority students into the STEM workforce.

Target Population: Minority students, including minority women, in Computer Science, Computer Engineering, Biology, Chemistry, Mathematics, and Cybersecurity.

Proposed Activities: (1) Robotics Academy for Pre-College Students: The Robotics Academy aims to inspire students to become science, technology, engineering, and math leaders by providing hands-on activities that broaden their educational experience and meet future workforce needs. Students who are team-oriented and passionate about finding solutions to problems are most attracted to this program. Our hands-on program integrates science, technology, engineering, and math, and students engage in inquiry-based investigations that teach them about designing, building, and programming robots to accomplish specific tasks. This program also helps students develop leadership, teamwork, and project management skills that prepare them for the future workforce; (2) Curriculum improvements will be made to strength coverage on topics related to Machine Learning, Mathematical Modeling and Data Science; (3) Renovations will be made to the existing robotics lab with the required equipment.

Anticipated results of the proposed project include: (1) establishing a new self-sustaining research capacity in machine learning, mathematical modeling, and data science in Robotics that will attract more external funding; (2) an increase in the number of scientific publications by both faculty and students; (3) improved student knowledge in machine learning, mathematical modeling, and data science in all related fields including environmental science and nursing with nursing robots; (4) an increase in the number of minority students interested in pursuing careers and/or graduate work in STEM; and (5) an increase in the number of minority and women students who persist in science and engineering curricula.

FL - Florida A&M University
Tallahassee, FL
Institutional Grant
P120A230058

Program of Excellence in STEM (PE-STEM) - Mathematics Academic Progress (MAPS)

Abstract

Program of Excellence in STEM – Mathematics Academic Progress (PE-STEM-MAPS) seeks to address the important issue of preparation of STEM majors in relevant mathematics courses, both prior to enrolling in their undergraduate programs and while matriculating through their major programs, by targeting rising 9th, 10th, 11th, and 12th graders who belong to groups traditionally underrepresented in STEM fields. PE-STEM-MAPS addresses these three components of **MSEIP Competitive Priority 1** through 1) increasing student exposure to early mathematics course content, particularly in those courses considered as “gatekeeping” or foundational to STEM majors, and immersing them in tutorial learning and skill enhancement in a year-long format; 2) engaging selected students in ALEKS preparation for optimum performance and future success on the examination, thereby leading to more advanced placement in mathematics courses upon college enrollment, as a means of advancing their retention, progression, graduation and professional placement in careers in the STEM disciplines; and 3) working with K-12 teachers, particularly those from schools servicing underrepresented populations, in best practices in mathematics pedagogy and student learning, as well as merging skills taught on the high school and early college STEM mathematics curriculum. Such early exposure to math course material commonly seen in the first two years a STEM major can help to demystify the coursework and preparation many young people, especially those of underrepresented groups, removing mental barriers towards STEM disciplines with heavy mathematics content. This goal will be accomplished by the following structured 3-tiered approach:

- 1) **Recruitment:** a) Improving the preparation of area high school students to succeed in foundational mathematics or coursework relating to STEM areas of study; and b) Exposing students to opportunities to strengthen and enhance mathematics skills in preparation for the ALEKS mathematics placement exam, leading to faster enrollment in STEM majors of choice;
- 2) **Retention:** a) Involving K-12 and FAMU students in monthly tutorial workshops designed to strengthen student mathematics skills and development; b) Establishing a student cohort in the STEM majors that can be advised and guided successfully towards the mathematics curriculum in these related areas; c) Establishing a teacher cohort that can work to better inform the K-12 mathematics curriculum and build towards enhancement and strengthening of K-12 math courses to best align with early year college math courses; and c) **Graduation:** a) Assisting students in strengthening their math ability and opportunities while in college, through exposure to tutorial employment and other math-related internship and research opportunities; and b) Utilizing professional connections through PE-STEM-MAPS program faculty mentors to connect graduating students with graduate fellowship and scholarship opportunities, as well as career placement in math-related STEM professions.

FL - Nova Southeastern University
Ft Lauderdale, FL
Institutional Grant
P120A230002

PROSPERITY - Promoting and Reinforcing Offerings, Supports, and Practices Engendering Resiliency through Inclusive Techniques and communityY

Abstract

Applicant Institution: Nova Southeastern University (NSU), Fort Lauderdale, FL. The College of Computing and Engineering at NSU (a four-year Hispanic-Serving Institution) is leading a partnership with NSU student services departments, Broward County Public Schools, and local industry to implement a science improvement plan to strengthen learning outcomes for minority/female students by addressing academic and personal challenges that negatively impact their learning success and career opportunities.

Project Goal and Objectives
Goal: To contribute to the American innovation economy by diversifying the STEM workforce. Objectives: (1) Increase the percentage of full-time, degree-seeking minority undergraduate students enrolled in Computer Science/IT, compared to the average minority enrollment in Computer Science/IT in the three-year period immediately prior to the beginning of the grant; and (2) Increase the percentage of minority students enrolled in Computer Science/IT who are on track to graduate within six years.
Target Population
9,660 underrepresented minority and minority female Computer Science/Information Technology dual enrollment and lower division students.
Proposed Activities
A1: New Computer Science/IT Dual Enrollment Cohort with the Broward County Public School (BCPS) District. A2: Specialized Academic Activities and Support Services. A3: Culturally Responsive Holistic Mentoring/Coaching/Advisement/Advocacy. A4: STEM Faculty Diversity, Equity, Inclusion, and Accessibility (DEIA) Professional Development.

IL - Chicago State University

Chicago, IL

Institutional Grant

P120A230034

SCALE: STEM Capacity Accelerates Learning and Employment

Abstract

Chicago State University (CSU) is a comprehensive urban university, whose five colleges offer 36 undergraduate degrees and 25 graduate and professional degree-granting programs, as well as extension courses, distance learning, and not-for-credit programs. The campus is located in a residential community on Chicago's South Side, with over 1 million Black and Hispanic residents living within a 10-mile radius. Currently serving 2,325 students, CSU's enrollment reflects this service area and is classified as a Minority Serving Institution (MSI) and specifically as a Predominantly Black Institution (PBI). CSU students are 67% female, nearly 75% Black, 69% age 25 or older, 91% receiving need-based financial aid, and 50% with at least one child.

In order to build its capacity to prepare minority students for careers in Science, Engineering and other STEM fields, CSU proposes SCALE: STEM Capacity Accelerates Learning and Employment, a Minority Science & Engineering Improvement Program (MSEIP) designed to achieve three significant goals: 1) Improve accessibility of course-related learning opportunities to expand the learning and employability of STEM students; 2) Expand the capacity of CSU to engage students in STEM learning and prepare them for a career in STEM fields; and 3) Provide area secondary students with multiple paths for STEM career exploration and experience. Measurable objectives in support of these goals include A) Increase the average number of STEM work-related experiences that individual students participate in by 50%; B) Increase the year-to-year retention of STEM students from 1000 to 2000, and 2000 to 3000/4000 level courses, by 10% each; C) 80% of STEM faculty will participate in professional development over the course of the grant period; D) 85% of STEM students will benefit from improved facilities, expanded research opportunities, or data science training; E) Increase the number of Pre-Freshman Engineering and Physics (PREP) Program or High School STEM- related Summer Camps students who attend at least one CSU STEM recruitment event by 60%; and F) Increase the number of dual enrollment students interested in STEM careers by 50%.

SCALE addresses the three parts of Competitive Preference Priority 1: Goal 1 supports the development and implementation of high-quality and accessible learning opportunities, particularly those that are work-based and flexible for working students; Goal 2 supports the development and implementation of evidence-based strategies to promote students' development of knowledge and skills necessary for success in the STEM workforce; and Goal 3 provides secondary school students with access to career exploration and dual enrollment opportunities to help students make informed decisions about their postsecondary enrollment. In addition, Chicago State University is a new potential grantee that has not received MSEIP funding within seven years, which meets Competitive Preference Priority 2.

SCALE's evidence-based strategies will be evaluated by OER Associates, LLC, and will contribute to what is known about quality postsecondary science education. The capacity of CSU to offer career exploration, engaging instruction, improved lab space, academic support, STEM- specific advising, peer and faculty mentoring, collaborative research experiences, accessibility of STEM work experiences and job preparation to minority students, particularly minority women, will be life changing, and it will continue CSU's legacy of meeting students where they are, then challenging and supporting them to achieve their full potential.

LA - Southern University at Shreveport
Shreveport, LA
Institutional Grant
P120A230061

Reducing Barriers to Success: Enhancing Academic Opportunities and Advancing Technological Education for Minorities Through Engineering Technology Career Pathways

Abstract

Southern University at Shreveport (SUSLA), a public, historically black college, and university (HBCU) with over 90 percent minority student population, proposes a Minority Science and Engineering Improvement Program Institutional Project (MSEIP) that seeks to expand academic and career pathways in its Engineering Technology degree program. The project also seeks to broaden secondary students' educational and career exploration by providing enrichment activities and learning opportunities that supports access to postsecondary educational credentials in engineering and technology. This may be accomplished by expanding access to engineering and technology curricula and laboratories for the economically disadvantaged, under-represented minorities, rural community and high school students. This can be achieved through distance learning technologies and dual-enrollment opportunities, meeting the MSEIP Competitive Preference Priorities. In order for the U.S. to remain competitive on the global stage, investments in human capital and an increase in the participation rate of under-represented minorities and rural communities must be centrally-thematic in K-12 and postsecondary STEM programs across the nation. SUSLA's Department of Engineering & Technology (DoET), proposes an Institutional project titled "*Reducing Barriers to Success: Enhancing Academic Opportunities and Advancing Technological Education for Minorities Through Engineering Technology Career Pathways*" (RBS Project).

SUSLA's RBS Project is a three-year project that will design, develop and implement Green Energy and Controls curricula that seeks to expand the capacity and diversity of the STEM employment pipeline with workforce-ready completers. Over the duration of the grant, SUSLA's RBS Project will implement enhanced recruitment strategies, provide academic enrichment opportunities, and facilitate completion strategies for under-represented minorities who endeavor to realize their educational and employment goals in the STEM fields of engineering and technology. The RBS Project's motivating impetus is derived from the Biden-Harris Administration's *Green Energy initiative* and the Department of Education's *Raise the Bar: STEM Excellence for All Students initiative*, which is designed to strengthen Science, Technology, Engineering and Mathematics (STEM) education nationwide. To that end, the RBS Project's overarching goal of strengthening the workforce pipeline with diverse, skilled graduates addresses the Department of Education's initiative through the following three specific goals: **1)** Create a sustainable pipeline of students to HBCU engineering and technology programs through active recruitment and engagement of minorities and females beginning at the high school level; **2)** Develop and implement high-quality and accessible learning curricula utilizing hybrid learning models and distance learning technologies to extend program delivery; and **3)** Provide experiential learning opportunities and career exploration for target populations by facilitating collaborative co-curricular programs for secondary and postsecondary students.

SUSLA's RBS Project will accomplish the stated goals through the following objectives: **(1)** provide high-quality and accessible learning by developing and implementing hybrid and online course offerings in Alternative and Renewable Energy (Green Energy) and Controls, **(2)** advance students' knowledge, skills, and abilities (KSAs) by developing an Energy and Controls experiential, distance learning lab (ECELL) for problem-solving in the 21st century classroom, **(3)** increase awareness of educational and career opportunities through the STEM Enrichment Academy (SEA), and **(4)** administer community engagement and outreach activities aimed at improving participation of hard-to-reach, rural students, under-represented minorities, females, and students with disabilities in the energy and technology sector.

By completing these objectives and realizing each goal, SUSLA's RBS Project addresses the Department's Competitive Preference Priorities (**1a, 1b, 1c**) and provides enrichment activities that incorporates authentic experiences in proficiency-based learning for secondary and postsecondary students.

MT - Fort Peck Community College
Poplar, MT
Institutional Grant
P120A230046

Science, Technology, Engineering and Math (STEM) Wo'kinihan (Respect) Academy Project

Abstract

Primary Goal: We are proposing to implement an **Institutional Project** with the primary goal of executing a comprehensive STEM improvement plan to advance the preparation of our students for careers in scientific and technological careers.

Target Populations: We will be serving Fort Peck Indian Reservation high school students, *FPCC* students, teachers at our local K-12 institutions, and students attending MSU-Northern (our partner 4-year institution).

Primary Objectives and Corresponding Activities:

Objective #1: During the project period of October 1, 2023, through September 30, 2026, the *FPCC* STEM Wo'kinihan (Respect) Academy Project will implement an early entry STEM bridge summer program for 45 (15 each summer) American Indian high school seniors utilizing two separate pathways –STEM research teams and active learning STEM coursework, as measured by recruitment and enrollment records, student attendance, evaluations from students, and external evaluation results.

Objective #2: During the same project period, the STEM Wo'kinihan (Respect) Academy Project will provide a STEM summer academic and research program for 45 (15 each summer) current *FPCC* American Indian STEM majors, utilizing two separate pathways –STEM research teams and active learning STEM coursework, as measured by recruitment and enrollment records, student attendance, evaluations from students, and external evaluation results.

Objective #3: During the same project period, the STEM Wo'kinihan (Respect) Academy Project will provide professional development throughout each program year to 45 (15 each year) math and science teachers from *FPCC* and the four (4) middle and high schools serving predominantly Assiniboine and Sioux students, as measured by agendas, sign in sheets, training evaluations from instructors, and external evaluation results.

Objective #4: During the same project period, the STEM Wo'kinihan (Respect) Academy Project will develop a “What Works” guide to increase the participation rates of Native American students in rural communities into STEM fields of study and careers as measured by a comprehensive researched document produced based on data collected throughout the three-year project period, student surveys/evaluations, and external evaluation results.

Anticipated Results: **Output 1)** increase foundational knowledge and mastery of basic STEM concepts in science, engineering, and math; **Output 2)** improve the STEM curricula for learners at local secondary schools and *FPCC*; **Output 3)** increase the enthusiasm of these same students in STEM-related topics so that they continue with them during their post-secondary education; and **Output 4)** reduce the rate of failure of students currently enrolled in STEM studies. These outputs will result in the following outcomes: **Outcome 1)** increase our student enrollment in STEM related fields of study at *FPCC*; **Outcome 2)** increase the number of STEM degrees conferred to *FPCC* graduates, and **Outcome 3)** increase the number of students matriculating to four-year institutions over the three-year project period.

Competitive Preference Priority: We are addressing both Competitive Preference Priorities. As such, we respectfully request 12 competitive preference points.

NJ - New Jersey City University
Jersey City, NJ
Institutional Grant
P120A230078

Closing the Skills Gap in Gatekeeper STEM Courses

Abstract

New Jersey City University (NJCU) is a Hispanic/minority-serving institution in Jersey City, one of the most diverse city in New Jersey and the U.S. Most of NJCU's students are economically disadvantaged, have average family incomes of \$42,000, depend heavily on public forms of financial aid, are the first in their families to attend college, and belong to minority groups that are underrepresented in STEM. NJCU's undergraduate retention and graduation rates are marginal and in STEM lag because of poor preparedness for gateway courses in chemistry and physics.

This project is designed to increase the success of STEM-declared students in gatekeeper chemistry and physics courses, which will improve student persistence, retention, progression and program completion. The project will also support student success through internship, curriculum and career planning. The project will leverage NJCU's existing *Proyecto Science* summer program for secondary students to positively impact their college preparation, recruitment and enrollment. **Overall, the project goal is to improve the enrollment, persistence, graduation and postsecondary success of Hispanic and low-income students, particularly minority women.** This project has six objectives:

- 1. Promote individualized learning** through Embedded Peer Tutoring & tutoring in The HUB.
- 2. Develop students' knowledge & skills necessary for success in the workforce and civic life** through Career Planning & Financial Literacy training.
- 3. Support choice of careers & majors** through workshops for pre-college student & high school teachers, in collaboration with NJCU's *Proyecto Science* summer program.
- 4. Work-like Learning & Community/Civic Engagement** through faculty-mentored research internships and volunteerism with community organizations based on their interests.
- 5. Faculty Professional Development** to ensure continuous growth and effectiveness, enhance knowledge, skills, and best pedagogical practices, and maximize the impact of redesigned courses.
- 6. Improved Courses & Curricula** through an embedded math and problem-solving curriculum in gateway STEM courses and implementation of POGIL and other effective teaching techniques. Online courses will be redesigned through the application of Quality Matters and other standards.

The project will impact about 1500 mostly underrepresented minority and women students over three years. The project is expected to increase our one-time chemistry/physics course passing rate, improve A-B-C rates and reduce student withdrawals. **The overarching goals of this grant opportunity address the MSEIP Competitive Preference Priority 1a. high-quality and accessible learning opportunities, 1b. knowledge and skills necessary for success in the workforce and civic life, and 1c. providing secondary school students with career exploration and advising opportunities.**

Major expected outcomes of the Project include:

- **Improved student learning outcomes & success in gateway CHEM & PHYS courses**
- **Improved academic standing, persistence, retention & graduation of STEM students**
- **Demonstrated financial literacy, problem-solving & civic engagement of STEM students**
- **Demonstrated career- & postsecondary planning among high school students**
- **Improved design of & teaching in gateway CHEM & PHYS courses**

NY - Mercy College
Dobbs Ferry, NY
Institutional Grant
P120A230050

Project SAGE (Support, Access, Growth, Experience)

Abstract

Mercy College, a private, federally designated Hispanic-Serving Institution with campuses located in New York, is proposing a three-year MSEIP Institutional Project to provide **Support, Access, Growth, and Experience (SAGE)** to minority students, particularly minority women, enrolled in four program majors: Computer Information Systems, Computer Science, Cybersecurity, and Mathematics at the College as well as to youth from area public schools. In addition, 3rd, 4th, and 5th grade teachers from the Yonkers City Public Schools will receive professional development designed to increase content knowledge and instructional pedagogy.

Project SAGE will strive to achieve five distinct objectives as follows: 1) To recruit and select in each project year at least 30 high school students, at least 70% of whom will be female or minorities, for participation in the M³C Summer Program; 2) To increase by 2% the number of STEM degree-seeking undergraduates who persist in the major from one academic year to the beginning of the next academic year in each project year, culminating in a 6% increase over the project period; 3) To offer planned activities and services designed to increase by at least 5% the number of STEM undergraduates who complete a BS degree at Mercy College within six years;

4) In each year of the grant, to provide professional development activities to public school teachers to strengthen teacher skills for improved student outcomes in mathematics; and 5) To collect, analyze, and use high-quality, timely data to inform SAGE's implementation and achievement and to generate measurable student outcomes for persistence and graduation, and national dissemination of project results to appropriate stakeholders.

Six activities are proposed for Project SAGE, including those that address **Competitive Preference Priority 1: Increasing Postsecondary Education Access, Affordability, Completion, and Post-Enrollment Success:**

- 1) *Mathematical Modeling* – The M³C Summer Program, a community outreach program, offers secondary school students an intensive four-week program designed to teach mathematical modeling progressively, with an emphasis on relating concepts and projects to real-life experiences (CPP1(c)).
- 2) *Growth Mindset Intervention* – Project SAGE faculty will redesign three gateway courses to implement growth mindset interventions aimed at improving students' academic achievement and college persistence (CCP1(a)(b)).
- 3) *Real-Life Application Problems* – Faculty will collaborate across disciplines to develop and implement real-life application problems and mini-projects relevant to students' future careers that can be used in Math 116 (College Algebra) (CPP1(a)(b)).
- 4) *Professional Development* – Project SAGE will offer professional development to primary school teachers in the Yonkers Public Schools, the fourth largest school district in New York State and consisting of 78% minority students (62% Hispanic and 16% Black).
- 5) *Internship Support* – Project SAGE will support internship opportunities with the aim of funding

two unpaid internships per year offered by governmental agencies that will help students network with people in their field while also sharpening their skills before entering the workforce (CPP1(a)(b)).

- 6) *Faculty Drop-in Tutoring* – In order to supplement existing opportunities for tutoring and to maximize the flexibility of help available to students, faculty drop-in tutoring hours will be offered in the evenings and on weekends to accommodate working students' schedules.

The project design has been informed by research on minority students in STEM. Overall, the objectives of Project SAGE aim to improve the quality of preparation for careers or graduate work in STEM and to foster a sense of belonging and community for underrepresented students.

PR - Universidad Del Sagrado Corazon
San Juan, PR
Institutional Grant
P120A230071

computing@sagrado project

Abstract

The **computing@sagrado** project main goal is to strengthen Sagrado's Computing offerings to increase access, retention, and graduation of students in underserved groups, such as Hispanic and women, in alignment with the specific needs of the IT industry and quality standards. The project objectives and activities include:

1. Increase Hispanic students' success in the BS of Computer Science and Digital Applied Technologies through the curricular review and alignment with the IT industry needs and ABET's Computing Accreditation Commission.
2. Supporting Hispanic students' retention and completion in Computer Science programs through a flexible, stackable credential structure.
3. Increase retention and completion through work-based learning experiences and career advising services.
4. Strengthen student support by establishing Sagrado's Data Dimension Hub.
5. Promote access of secondary school students from underserved populations to Sagrado's Computer Science programs through a Pre-College initiative.

Quantifiable data indicators will include: the Computer Science curricular review and alignment with IT industry needs and ABET's CAC; percentage increase in Hispanic and women students enrolling in the **computing@sagrado** programs; percentage increase in Hispanic and women students retention and completion in Computer Science programs using the stackable structure and the WBL experiences; number of stackable completions by computer science students; number of computer science students visiting the Career Advisor; percentage increase in Hispanic and women graduates securing jobs in the field; number of high school students participating in the Pre-College initiatives (Summer Camp, Early College, and Women in Science student chapter); percentage increase in high school students choosing computer science as their field of study at the university level.

The competitive preference priority addressed is Priority 1 (a), (b) and (c).

PR - Universidad Ana G. Mendez
San Juan, PR
Institutional Grant
P120A230082

I-STEAMS (Innovative Science and Technological Experiences with Activities for Minority Students)

Abstract

The main goal of the proposed MSEIP project I-STEAMS (*Innovative Science and Technological Experiences with Activities for Minority Students*) is to recruit and retain underrepresented high school students, especially women, in STEM-related career pathways. This project seeks to impact 120 high school students and 40 schoolteachers per year, in addition to first-and-second year undergraduate students from rural areas close to UAGM-Aguadilla. This project proposes the following objectives: By the end of the program, (1) provide 240 secondary school students with a hybrid, evidence-based, **Saturday STEM academy** that improves the students' quality of work in STEM curricula, and foster the development of technical, soft skills and mental wellness;(2)provide 120 secondary school students in the western area of Puerto Rico with a four- week **Summer Bridge** program focusing on STEM, technical and soft skills and mental wellness;(3)provide 120 secondary science teachers with an **Online STEM Training program** that improves their skills and knowledge in STEM areas;(4)offer **Monthly Lectures** to first and second-year college students, along with faculty from STEM-related fields, to improve the readiness and awareness of mental wellness for both remote and in-person learning environments; (5) develop a **Virtual and in-campus Tutoring and Mentoring program** for students enrolled in STEM related fields; (6)provide minority high school students with **pre-enrollment career advice, on-field training opportunities, academic enrichment activities, and financial assistance** (through stipends), to assure their success and facilitate transition into STEM-related careers;(7) at least **85%** of the enrolled students in STEM-related fields will be minority students, especially women, students with disabilities, and adult students pursuing a career in science related fields. The proposed project's objectives comply with the MSEIP Priority Area 1: Increasing Postsecondary Education Access, Affordability, Completion, and Post-Enrollment Success by (a) Supporting the development and implementation of high-quality and accessible learning opportunities, including accelerated or hybrid online, work-based, and flexible for working students (b) Supporting the development and implementation of evidence-based strategies to promote students' development of knowledge and skills necessary for success in the workforce and civic life (c) Providing secondary school students with access to career exploration and advising opportunities to help students make informed decisions about their postsecondary enrollment decisions and to place them on a career path. UAGM will also address Priority Area 2 as the institution has not received MSEIP funding within seven years before the deadline date for submission of applications under this competition. The anticipated results include: Minority students with better knowledge and skills for the STEM fields; increase in the number of students that select STEM careers in the Institution; minority students with conscience of the importance of mental wellness; better prepared secondary school teachers in STEM areas that will prepare more qualified minority students for STEM careers; increase in the retention rates of the Institution; increase of minority students' adaptability and resilience, enabling them to effectively navigate future challenges in their academic and professional careers; achievement of a more diverse and equitable representation of underrepresented groups in STEM related areas in accordance with the Diversity Policy of the Institution.

PR - University of Puerto Rico at Aguadilla

Aguadilla, PR

Institutional Grant

P120A230084

Supporting Opportunities for Learning, Awareness, Research, and Inclusion in STEM and Citizen Science (SOLARIS)

Abstract

The University of Puerto Rico at Aguadilla (UPR-Ag) is a part of the University of Puerto Rico's public higher education system. It offers baccalaureate and associate degree programs and has been accredited by the Middle States Association of Colleges and Schools since 1976. With a student population of 2,352 full-time equivalent (FTE) students, the majority being Hispanic, UPR-Ag serves as an important educational institution in Puerto Rico.

Title: “SOLARIS: Supporting Opportunities for Learning, Awareness, Research, and Inclusion in STEM and Citizen Science ”. Budget: **\$900,000** over three years.

1. **Goal:** We aim to elevate the year-to-year freshman retention rate from 82% by 5% to 87% and increase the 4-year graduation rate by 6%, from 4% to 10%.

We propose to achieve this goal through three cores with activities that are briefly described below.

Workforce and Civic Life knowledge and skills Core

- *Activity 1: ALMA* “Advancing Life-Design for Minority Achievement” embraces one-one career coaching, panels, and programs to explore career options and experiential learning opportunities for undergraduate STEM students.
- *Activity 2: US* “University as a Safe Space” develops a series training workshops, awareness campaigns and provides resources to promote inclusive experiences.

Accessible Learning Opportunities Core

- *Activity 1: EMPRENDE* “Empowering Minority Peers for Research, Education, and Networking through Diversity and Equity” focuses on underserved minority students and aims to improve their educational experience through peer mentoring, interdisciplinary research in Citizen Science, and community engagement.
- *Activity 2: ADMIRO* “Advancing Data Science and Minority Research Opportunities” provides data science training to increase the students’ hard skills and competitiveness in the job market.
- *Activity 3: The Center for Assessment of Learning Chemistry* increases the pass rate in organic chemistry courses by the transformation of a classroom into a learning center with manipulative models, chemistry tutors and the integration of interventional workshops.

Core for Engaged Research: As a Career Path

- *Activity 1: ENSEÑA* “Environmental Network for Spanish-Speaking Educators and Advocates” integrates citizen science methods into environmental science and conservation biology training directed to equip high school STEM teachers and creates a network between secondary students.
- *Activity 2: HERENCIA* “Hispanic Educators' Resource for Environmental and Nature Conservation Initiatives and Advancement” develops an online platform with resources and curricula for the development of STEM research projects by High School Teachers.

Key Measures (yearly):

1. Recruit 100 undergraduate students to participate in career exploration workshops and counseling.
2. Impact 100 university students through the safe space awareness campaign training workshops.
3. Enroll 30 students for the peer mentoring research and citizen science program.
4. Recruit 20 university students in STEM in advance research mentoring.
5. Enlist 100 students to take part in an inclusive and redesigned version of organic chemistry.
6. Recruit 10 high school STEM teachers to be trained in the integration of citizen science methods.
7. Increase the year-to-year freshman retention rate from 82% to 87%. Second, we intend to increase the 4-year graduation rate from 4% to 10%, resulting in a 6% improvement.

Title III will operate in accordance with all **General Education Provisions Act (GEPA)** and **Government Performance and Results Act (GPRA)** requirements to ensure program objectives are met for diverse participant groups.

PR - University of Puerto Rico at Aguadilla

Aguadilla, PR

Institutional Grant

P120A230018

Creating Opportunities through Networking, Education, Community-building, and Training (CONNECT)

Abstract

The University of Puerto Rico at Aguadilla (UPR-Ag) is part of the University of Puerto Rico public higher education system. It Serves 2352 FTE students, **99% Hispanic**. Offers baccalaureate and associate degree programs. Current total operating budget is \$20,004,975. The Middle States Association of Colleges and Schools has accredited the Institution since 1976.

Title: Project *CONNECT: Creating Opportunities through Networking, Education, Community-building, and Training*. Budget: \$900,000 over three years

1. **Goal:** we aim to elevate the year-to-year freshman retention rate from 82% by 5% to 87% , and increase the 4-year graduation rate from 4% to 10%, resulting in a 6% improvement.

Four activities are proposed which are briefly described below.

Activity 1: Community Building: Cultivating Achievement, Representation, and Exploration for Underrepresented High School Students (CAREERWISE): CAREERWISE will provide high school students a supportive and inclusive community for students to connect with peers who share similar backgrounds and experiences, receive mentorship and guidance from STEM professionals, and access resources and support services to help them succeed in STEM fields.

Activity 2: Research Opportunities and Internships: Supporting Pathways for Aspiring Researchers and Knowledge-seekers (SPARK): By providing underrepresented minority students hands-on research experiences and opportunities to work alongside STEM professionals, SPARK aims to increase students' interest and confidence in STEM fields, ultimately leading to greater retention and success in STEM disciplines.

Activity 3: Summer Outreach: The Helping Everyone Reach Opportunities (HEROs) Camp: HEROs camp will provide underrepresented minority high school students with hands-on STEM activities, exposure to STEM professionals and careers, and access to resources and support services to help them succeed in STEM fields.

Activity 4: Improving the Physical Learning Environment; to provide adequate and appropriately equipped space, developing flexible learning environments and refurbishing our teaching laboratories.

Key Measures:

2. Enlist 10 students to participate in undergraduate research in our campus, and 4 to partake in a Summer Research Internship in Ohio State.
3. Recruit 8 university students to act as mentors to high school students for the Community Engagement activity.
4. Recruit each year 24 high school students to participate of the Summer STEM Camp.
5. Enlist 50 high school students to attend a Career Exploration Fair.
6. Recruit 50 high school students to attend a College and Career Counseling Fair.

7. Offer Green Science workshops to 200 high school students.
8. Remodel 2 science laboratories, 2 classrooms, and 2 common areas in the Natural Sciences Department.
9. Enhance the retention rate for biology majors by targeting specific goals. First, we aim to elevate the year-to-year freshman retention rate from 82% to 87%. Second, we intend to increase the 4- year graduation rate from 4% to 10%, resulting in a 6% improvement.

Title III will operate in accordance with all **General Education Provisions Act (GEPA)** and **Government Performance and Results Act (GPRA)** requirements to ensure program objectives are met for diverse participant groups.

PR - University of Puerto Rico at Ponce
Ponce, PR
Institutional Grant
P120A230051

GET by STEM: MSEIP Continuity Cycle

Abstract

The University of Puerto Rico in Ponce presents the project GET by STEM IV: MSEIP Continuity Cycle (GbS). GET by STEM stands for Girls Engineering Trip by visiting STEM- related disciplines and industries across the island. According to the U.S. Department of Agriculture's Animal and Plant Health Information Service, Puerto Rico (PR) is the third leading region in the U.S. for plant biotechnology research. Furthermore, according to the Puerto Rico Industrial and Development Company, PRIDCO, twelve (12) of the top twenty (20) pharmaceuticals and biotechnology companies around the world have manufacturing operations in PR. Seven (7) of the ten (10) selling medications in the world are produced in PR. These major industries are based on STEM foundations like aerospace, pharmaceutical, biotechnology, medical services, information technologies, electric/electronics, knowledge services, and apparel. Taking advantage of these facts, the Department of Engineering (DOE) of the University of Puerto Rico in Ponce (UPRP) has developed the MSEIP project GET by STEM. GbS relies on a group of college female students to visit at least 180 public and private high schools and over 10,000 students (GbS I, II, and III have already impacted over 400 schools and over 24,000 students) during the project's period for recruiting not only for the DOE but all the STEM-related disciplines and to participate in the GbS Camp. **These numbers will be achieved by the MSEIP Continuity Cycle, an innovative strategy to provide secondary school students with access to career exploration and advising opportunities to help students make informed decisions about their postsecondary enrollment. (Competitive Priority 1).** Finally, the GbS Camp will provide high school female students with hands-on experiences in engineering, science, and technology by assisting with the scientific intimacy of all of these industries. A road trip visiting STEM-related industries across the island (STEM over Wheels), warmly welcomed, and nurtured only by female professionals of these industries. GbS will be the fourth MSEIP GET by STEM project resulting in a new generation of well-educated Hispanic females to be prepared for sciences, specifically in the engineering, mathematics, physics, biology, and biotechnology fields.

TX - Texas A&M International University
Laredo, TX
Institutional Grant
P120A230056

Minority Engineering and Science Improvement Program STEM-Squared (MSEIP-STEM²)

Abstract

The Minority Science and Engineering Program (MSEIP) project: **STEM Squared (MSEIP- STEM²)** at Texas A&M International University (TAMIU) will provide resources and program innovation to a Hispanic Serving Institution with an 89.2% Hispanic and 74% low-income student population. The proposed MSEIP initiative will meet all three components of the **Competitive Preference Priority 1** that seeks to increase postsecondary education access, affordability, completion, and post-enrollment success focusing on all STEM undergraduate programs at TAMIU focusing on engineering degrees.

The TAMIU **MSEIP-STEM²** will increase the production of a continuous stream of highly competent and well-qualified STEM professionals in South Texas. The primary objective of the TAMIU **MSEIP-STEM²** is to support outreach, summer workshops, tutoring, certificates, professional development, and work-based educational activities. The fundamental goal of this project is to increase enrollment, retention, and graduate rates in engineering programs at TAMIU. Additionally, a concerted effort will be made to attract female students into these programs.

Within this framework, other specific activities, and goals for the **TAMIU MSEIP-STEM² Program**, which all seek to meet students needs and improve retention and completion, include the following:

- Expand outreach with STEM-focused activities to Local Middle and High Schools.
- Launch summer workshops in mathematics, life sciences, and engineering for high school students and data preparation and visualization summer workshop for college students with a total of 150 students served per year.
- Offer targeted tutoring for STEM majors that will serve 170 students per year.
- Develop certificates that enhance marketable skills and professional development to enhance future career success across STEM.
- Support work-based educational opportunities through networking opportunities via travel to conferences.
- Over a three-year period, the **TAMIU MSEIP-STEM² Program** will increase the number of engineering students entering and graduating in the university's engineering programs by 9%.

Competitive Preference Priority 1: The **TAMIU MSEIP-STEM² Program** will address all three priority areas within this competitive preference priority. Area (1a) is support through planned work-based educational opportunities offered by MSEIP-STEM². Area (1b) that focuses on the students' development of knowledge and skills necessary for success in the workforce and civic life is addressed through certificates and professional development as well as targeted tutoring and a data preparation and visualization summer workshop. Area (1c) provides secondary school students with access to career exploration through outreach and summer workshops in mathematics, life sciences, and engineering.

In conclusion, the **TAMIU MSEIP-STEM² Program** will help to train the next generation of STEM professionals that will have a profound impact upon the underserved South Texas region.

TX - Texas A&M University-Kingsville
Kingsville, TX
Institutional Grant
P120A230063

Minority-engaged Access and Seamless Transition to STEM (MAST-STEM)

Abstract

Texas A&M University-Kingsville (TAMUK), a public, Minority Serving Institution with more than 70% Hispanic students, proposes an institutional and transformative project focused on increasing postsecondary education access, affordability, completion, and post-enrollment success for underrepresented minority students by conducting four core activities: 1) High School Ambassador (HSA) Program to provide high school students with latest information about STEM majors and careers, inspire their interests in STEM, and help them to make informed decisions about their college studies, 2) A one-week STEM Boot Camp (SBC) Program with continuous mentoring services for first two-year undergraduate minority students at TAMUK to ensure their success and completion in the bottleneck courses within their STEM curriculum, 3) A Summer Internship Training (SIT) Program for junior and senior minority students at TAMUK to gain valuable real-world working experience to ensure their success in the STEM workforce after graduation, and 4) A Service Learning Challenge (SLC) Program to TAMUK undergraduate students in STEM to increase their awareness and skills of community engagement and ensure their success in civic life. The **goals** of the MAST-STEM project are to:

1) Increase engineering and science student enrollment and retention at TAMUK through high-quality and personalized interventions to high school and first two-year undergraduate students, and 2) Improve minority students' awareness and readiness for success in STEM career workforce and civic life. This project will significantly enhance the existing relationships with local high schools and communities and improve the student services available at TAMUK. It will directly impact at least 1500 minority students in STEM majors. Strong institutional support and a plan for sustainability will guarantee a long-lasting impact at TAMUK. This project is responsive to Competitive Preference Priority 1 by addressing all three priority areas.

TX - Texas College

Tyler, TX

Special Grant

P120A230075

The TeachingSTEM Center: An Online MSEIP Training Center, e-Journal and Resource Center on Improving Methods of Teaching STEM to Underprepared Students

Abstract

Project Goals: Texas College is seeking funding through a Special Projects MSEIP grant in order to establish the TeachingSTEM Center, an online MSEIP Training Center, e-Journal and Resource Center for improving methods of teaching STEM to underprepared students. Texas College will collect, review, extract from, train, monitor, and mentor our STEM professors, Teacher Education professors, and Teacher Education students, on successful instructional strategies for serving under-prepared students. In addition, the Center will train faculty from other open admission institutions and minority and female-serving institutions of higher education to increase STEM enrollment, achievement, and post-graduation outcomes.

Target Populations: All of Texas College's STEM and non-STEM faculty as well as other faculty from IHEs who will be able to access the Center.

Proposed Activities: At least 20 Texas College and/or other open admissions faculty will commit to participate in the Center as a result of Texas College's outreach efforts. These faculty will be trained, coached, and provided technical assistance through the Center. The funding is also needed to populate and operationalize an e-training and testing Center on the TeachingSTEM website.

Anticipated Results: The outcome objective is that statistically significant improvements will occur in the quality of STEM training provided by participating open-admissions, minority institutions as measured by greater changes in STEM enrollment, achievement, retention, graduation, and post-graduation outcomes among the intervention versus comparison groups of students by each participating STEM, Teacher Education, and non-STEM faculty who choose to integrate more STEM knowledge into their courses.. The Project Outcomes include: 1) At least 20 Texas College and/or open admission faculty will commit to participate in the Center as a result of Texas College's outreach efforts; 2) Approximately 99% of participating faculty from each STEM and/or non-STEM discipline will volunteer to implement new STEM teaching and learning practices over the course of the grant; 3) Approximately 99% of participating faculty will receive a comprehensive assessment of their STEM instructional strategy needs; 4) Approximately 90% of participating faculty will share both effective and ineffective strategies regarding the teaching and learning practices that have affected their under-prepared students; 5) Approximately 90% of participating faculty will work with the Center's staff in the preparation of a training and technical workplan for addressing the needs identified in their assessment via enrollment in live and e- training; 6) Approximately 90% of participating faculty will participate in monthly and/or online training sessions on what can work in teaching STEM to under-prepared students in the "treatment" group during years 2 and 3 when implementation takes place; 7) At least one faculty in each of the disciplines of Biology, Chemistry, Computer Science and Physical Science/Physics and in the non-STEM courses will participate in randomizing students into intervention and controlled groups; and, 8) Approximately 50% of participating faculty will continue to use diagnostic assessment and targeted interventions for which they were trained to improve measured learning after grant expiration.

Competitive Priorities: This grant application from Texas College addresses and meets the requirements for both the "Increasing Postsecondary Education Access, Affordability, Completion, and Post-Enrollment Success" and the "New Potential Grantee" Competitive Preference Priorities.

TX - The University Of Texas At El Paso
El Paso, TX
Institutional Grant
P120A230011

Multi- Dimensional Interventions To Increase Stem Enrollment, Persistence, And Degree Completion Of Hispanics In Computing

Abstract

The proposed MSEIP institutional grant proposal submitted by The University of Texas at El Paso [UTEP] aligns with the mission of the U.S. Department of Education [USDoEd] to “promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access.” The proposed project also aligns with UTEP’s 2030 strategic plan that focuses on equity-conscious strategies to advance inclusivity across all sectors of the institution. The **overarching goal** of the proposed project is to implement multi-tiered, research-based interventions to bolster support systems for minority students: El Paso area secondary students and UTEP undergraduate and graduate students in computer science [CS], focusing on Hispanics, particularly Latinas. Over 84% of the students in the UTEP CS department are Hispanic; and, despite UTEP being one of the leading Hispanic- Serving Institutions in the U.S., the CS Department continues to have low representation of women: 18% as compared to the national average of 21%. Latinas are even more underrepresented at 15% of the total UTEP CS student enrollment. The proposed project addresses this low representation with goals that meet the three USDoEd priority areas of **Competitive Preference Priority 1 [CPP]** in the 2023 MSEIP solicitation: **(1)** create and implement hybrid CS1 and CS2 course sections/laboratories for undergraduate CS majors, especially working and caregiving students who are Hispanic [**CCP 1(a)**]; **(2)** develop the knowledge and skills among Hispanic CS undergraduate and graduate students necessary for success in the workforce and civic life [**CCP 1(b)**]; and **(3)** design, develop, and implement the *Career Exploration in Computing* program for Hispanic secondary school students focused on STEM career exploration, in particular computing, and advising to prepare them for postsecondary studies and career path decision making [**CCP 1(c)**].

TX - University Of Houston-Downtown
Houston, TX
Institutional Grant
P120A230070

UHD Promoting Improved STEM Student Success Through Math Modeling Using Applied and Visualization Techniques Across Math/Statistics/Natural Sciences/Computer Sciences

Abstract

The **UHD Promoting Student Success in Math Across Math/Statistics/Natural Sciences/Computer Sciences** project aims to use collaboration across disciplines, applied technologies, and visualization data tools key to the four-year college experience primarily for first time-in-college (FTIC) freshman undergraduates majoring in science, technology, engineering and mathematics (STEM). The project also aims to build long-term capacity at UHD (an HSI and MSI institution) to support barrier course performance across first, second, and third-year retention/persistence rates for underrepresented students, in particular targeting females thereby leading to increases in four-year and six-year graduation rates across STEM disciplines. Historically, STEM majors, particularly minorities and females, have demonstrated barriers upon entering STEM education, such as difficult transitions into the rigors of university study, low levels of assimilation associated with non-completion, costs of education and easily accessible academic/discipline support, and ease/comfort in building relationships early in their collegiate career (Kuh, 2008, 2010). By using curricular and co-curricular approaches of student support, the project addresses barriers through support strategies: 1) Increased access through **summer bridge research** mentored research programs; 2) **Accelerating math reviews and bypass exams (Revved UP)**; 3) Freshman **STARTUP** pre-entrance community building among STEM FTIC; 4) **Faculty/Peer mentoring system** within small learning community based on discipline (DOED Clearinghouse What Works); 5) prolonged **Academic Skill Self Surveillance**; 5) **Expert/Near Peer/Peer Mentoring**; 6) **Peer-led Team-Learning training toward leadership**; 7) Women/Men in STEM role-modeling presentations and (8) **Teacher/Parent Workshops** as a based for increased, **in-house recruitment**.