Raising the Bar – *Improving Hispanic student mastery of STEM content and accelerating completion*
Track 1: Building Capacity
Priority Area 1: Critical Transitions

Introduction

The proposed postsecondary transformational project in increasing Hispanic STEM majors and A.S. degree attainment and transfer is submitted by San Bernardino College (SBVC) (San Bernardino, CA) and Crafton Hills College (CHC) (Yucaipa, CA) as a collaboration between the two undergraduate colleges that comprise the San Bernardino Community College District (SBCCD).

As part of the initial implementation process, SBVC and CHC will design and implement knowledge sharing workshops for the faculty and student services staff to come together quarterly to report and disseminate the ongoing results and challenges of their activities. That information will form the basis of the annual reports to NSF and the external evaluator on grant progress.

1. Motivating Rationale, Goals, Objectives, Deliverables and Activities

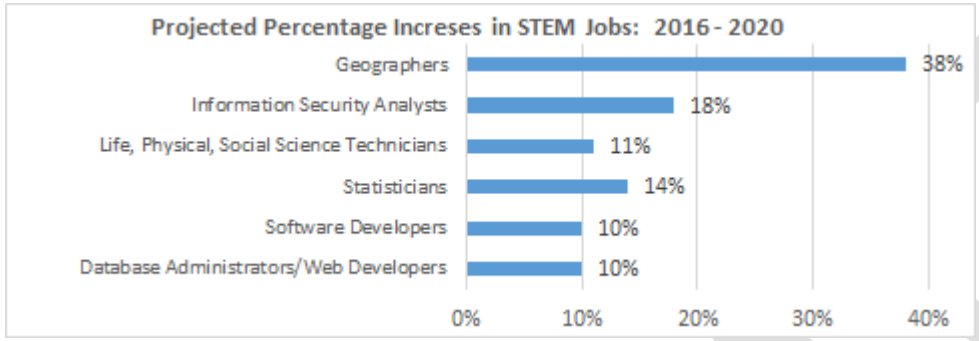
Intellectual Merit and Motivating Rationale: The region's economy has been primarily based on unskilled labor and low paying jobs in sectors such as agriculture, construction and manufacturing. The county-seat, the city of San Bernardino, declared bankruptcy in 2013. Since then a number of businesses have closed or moved their headquarters, most notably AAA, citing high crime relocated its base of operations to Highland. In September 2013, the U.S. Census Bureau released a report on poverty in the nation's 25 largest metropolitan areas. The Inland Empire topped the list at No. 1, according to an article in the Redlands Daily Facts[1].

According to a May 10, 2014 New York Times article on rising poverty in the Inland Empire, "nearly one-fifth of all residents live in poverty, the highest rate among the largest metropolitan areas in the country."[2] By the official federal measure, nearly one-third of all children here are poor. The number of poor in San Bernardino and Riverside Counties nearly doubled over the last decade." Within the city of San Bernardino, 33.4% of the population lives below the poverty level. This is nearly double the rate for the state of California. The city receives nearly $500 million annually in welfare assistance and 46% of its residents receive some form of welfare assistance.[3]

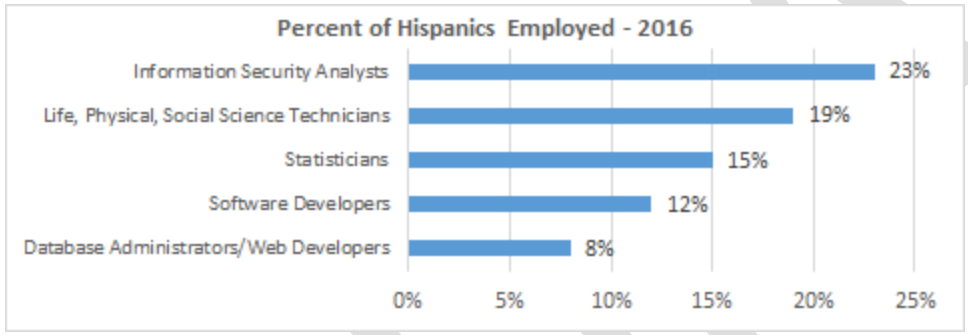
It is well known that the nation's workforce for the 21st century must have knowledge and competencies in science, technology, engineering, and mathematics (STEM) fields to contribute to a strong economy and be competitive at the global level. Burt Note Find Quote from DOE STEM Vision 2026 to add. Just as widely discussed, the STEM "skills gap" continues to persist, where positions remain unfilled because of a shortage of STEM skilled labor particularly for Hispanics. For example, the AMTEC Corporation, an Alabama-based company with a location in Riverside has the highest posting intensity in the area. Delivering engineering and technical services to federal government agencies and commercial entitles, AMTEC has a difficult time filling positions because they post jobs much more frequently than any other business in the area.[4]

While the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA) has substantially fewer (48%) STEM jobs than the national average, the growth of STEM positions in the region (6.5%) is projected to outpace both the state and national averages (6.3% and 5.9%, respectively).[5] Median hourly earnings in STEM occupations in the MSA ($32.13) far outpace the median hourly wages in the region ($16.41), yet

Hispanics are less likely to be employed in STEM occupations (18.9%) although constituting a larger percentage of the labor force in the region (28.8%).[6]



EMSI: Riverside - San Bernardino - Ontario, CA Metropolitan Statistical Area



EMSI: Riverside - San Bernardino - Ontario, CA Metropolitan Statistical Area

Within the US, the Hispanic population is presently over 55 million, comprising approximately 17% of the total US population.[7] Yet, this population makes up less than 10 percent of the science, technology, engineering, and mathematics (STEM) workforce.[8] Presently, California has the largest Hispanic population of any state, with over 15 million and growing.[9] In San Bernardino County alone, 2016 Census Bureau data estimates that Hispanics comprise approximately 52% of the total population.[10]

In California, Hispanic students constituted 44% of students in public two-year community colleges in 2016-2017, which has increased by 5% since 2012-2013. In comparison, Hispanic students constituted 59% of the student body at SBCCD in 2016-2017 steadily increasing every year for the last five years from 54% in 2012-2013 and outpacing the growth in Hispanic students statewide.[11]

Broader Impacts: As STEM occupations and Hispanic student populations in the Inland Empire are both growing and outpacing national and state averages, SBVC and CHC must focus on expanding exposure of STEM education to more students. Not only is there a moral imperative for SBVC and CHC to improve Hispanic student completion of STEM programs, but local employers and the future economy is depending on more Hispanics to be ready for the growing number of STEM jobs.

A major challenge is current Hispanic student participation in STEM programs and their subsequent academic performance. Hispanic students have a lower participation rate in STEM Gateway courses (54%) compared to overall Hispanic student enrollment at SBCCD (61%) Additionally, Hispanic students are successfully completing STEM Gateway course at lower rates (60%) than other students (63%). (CHC IR) Of the Hispanic students who first enrolled in math and English courses in 2010-2011, only 535 of the 1,427 students needing remediation in math successfully completed a college-level math course within six years. Similarly, of the 1,481 Hispanic students requiring remediation in English, only 581 successfully completed a college-level English course within six years.[12]

An analysis of job postings for STEM occupations in the Riverside-San Bernardino-Ontario MSA shows that employers not only want qualified employees, but employers are also looking for STEM graduates who are versed in soft skills such as leadership, communications, and problem-solving.[13] This movement towards higher levels of content mastery in STEM as well as the necessary soft skills is fundamental to the goal of this project.

The Goal of this project is to develop, implement, pilot and adopt new strategies for recruiting Hispanics into STEM degree programs, improving their achievement and completing their A.S. degrees (transfer ready) in a timely manner.

The objectives of the project are to:

1. Increase the number of students in STEM majors, promote community awareness and support for and knowledge of STEM fields, and ensure every STEM student feels connected and mentored towards completion of degree/transfer requirements;
2. Provide Hispanic-STEM degree seekers with a clear, coherent, and structured pathways that ensure students know what is required to succeed in their chosen program through fully articulated STEM degree programs with our regional 4-year institutions;
3. Accelerate and improve student mastery of STEM course content by customizing and contextualizing instruction that embeds real world applications, research and STEM examples in all transfer courses and to infuse technology into the programs of study to improve learning and program delivery;
4. Integrate student support with instruction through just-in-time student access to a variety of services including tutoring, peer mentoring, career exploration and co-requisite instructional opportunities and build relationships among Hispanic STEM students and advisors to continually monitor their progress and proactively provide meaningful feedback either in-person or via technology;
5. To grow the Hispanic STEM student community within our colleges and reward student behaviors that contribute to completion.

The project **deliverables** are:

A. A transformed and implemented SBCCD Recruitment Plan that connects high school Hispanic STEM-interested students more substantially to our colleges through a variety of academic “college-ready” strategies and STEM career/interest explorations;

B. Adoption by the two colleges of the nationally recognized degree pathways framework that guides students to degree attainment in a timely manner; and a revised and seamless degree path in STEM fields developed in partnership with our four-year regional educational institutions (University of California, Riverside; California State University, San Bernardino; Redlands University; and Loma Linda University);
C. An NSF/STEM-focused implemented faculty development plan for improving instruction that integrates the elements of the U.S. Department of Education's STEM 2026 vision into STEM instructional strategies and practices promoting mastery of scientific research skills and behaviors;
D. Implementation of a learning support initiative that integrates learning support systems with instruction so a student can access services (e.g. tutoring, educational planning, etc.) 24/7 through onsite or mobile technology;
E. Implementation of student support initiatives that foster intrinsic motivation, persistence and self-efficacy.

The **project activities** related to the goal and objectives are included in Table I below:

Table I

The Goal of this project is to develop, implement, pilot and adopt new strategies for recruiting Hispanics into STEM degree programs, improving their achievement and completing their A.S. degrees (transfer ready) in a timely manner.

(Note: EQ refers to Evaluation Question)

Project Objective	Activities	EQ	Measures Formative (f) and Summative (s)	Schedule
1. Promote community awareness of and support for STEM fields.	Develop an enhanced STEM recruitment plan to include: • Embed STEM-specific informational workshops into college in reach, outreach, and transitions processes (e.g. Super Saturday, SOA3R, concurrent enrollment, family night, financial aid) • Facilitate STEM Career Awareness workshops and field trips for STEM and non-STEM majors sponsored	4, 5	**Research Focus:** *To what extent did the components of the recruitment plan have on subsequent college enrollment?* Post workshop surveys; Workshop Participation data (f);	By Term

Table I **The Goal** of this project is to develop, implement, pilot and adopt new strategies for recruiting Hispanics into STEM degree programs, improving their achievement and completing their A.S. degrees (transfer ready) in a timely manner. *(Note: EQ refers to Evaluation Question)*				
Project Objective	**Activities**	**EQ**	**Measures** Formative (f) and Summative (s)	**Schedule**
	by the colleges to STEM businesses and industries • Incorporate learning technologies into math classes and STEM workshops (ALEKS, My Math Lab, My Writing Lab) • Promote familial, community, and self-coping support through parent orientations, open houses and community meetings		Enrollment data on new to college students (s).	
2. Provide Hispanic, STEM degree seekers with a clear, coherent, and structured pathway through fully articulated STEM degree programs.	• Identify articulation gaps w/ regional 4-year institutions and feeder high schools and update articulation agreements in STEM fields • Refine STEM program maps and meta-major handouts • Enhance data sharing initiatives between the SBCCD and receiving universities regards transfer, major, progress, success and completion • Develop and sustain comprehensive and regular counselor training and shadowing on STEM pathways and articulation	6	**Research Focus:** *What effect did the various workshops have on persistence and degree attainment?* Student Satisfaction Surveys; Student participation data (f) correlated to student progress (s) and degree attainment (s).	By Term After Workshop By Term
3. Accelerate and improve student mastery of	• Develop STEM faculty knowledge about contextualized instruction, active learning strategies, and innovative STEM instructional	1, 2	**Research Focus:** *What effect did the innovative instructional strategies have on*	

Table I **The Goal** of this project is to develop, implement, pilot and adopt new strategies for recruiting Hispanics into STEM degree programs, improving their achievement and completing their A.S. degrees (transfer ready) in a timely manner. *(Note: EQ refers to Evaluation Question)*				
Project Objective	**Activities**	**EQ**	**Measures** Formative (f) and Summative (s)	**Schedule**
STEM course content.	technology through workshops, conference, and research with 4-year institutions and private partners • Promote contextualized learning activities, such as job shadowing, internships, service learning, and lab and research experience • Embed publication/presentation research components into STEM curriculum • Research, develop, evaluate and implement disaggregated first-year assistance workshop for just-in-time student access • Train faculty on and integrate ChemDraw, MATLAB, LaTeX, ALEKS, MyMathLab, MyWritingLab, Maplesoft and other instructional technologies into STEM curriculum • Expand access to existing and new interdisciplinary STEM laboratory curriculum and participation in co-curricular competitions		*course content effectiveness and improved student mastery and skills acquisition?* Number of course revisions Student attainment –vs- historical data Student participation rates in SMARTshops; Student satisfaction surveys. Student Attainment Data – vs- historical data	 By Term By Term By Term After Workshop By term
4. Integrate student support with instruction and build relationships	• Initiate embedded tutoring and other learning assistance initiatives (e.g. supplemental instruction, structured learning assistance, and directed learning activities) in STEM gateway courses.	3	**Research Focus:** *What effect did the various learning assistance services have on*	

among Hispanic STEM students and faculty.	• STEM-trained counselors meet with STEM students once a semester to review educational plans and degree audit • Implement Starfish mobile retention tool to promote intrusive advisement, support, educational plans and degree audits • Investigate and implement faculty-to-student and student peer mentoring programs • Explore sustainable STEM mentorships with professionals employed in STEM fields.		*course completion?* Student participation rate Student satisfaction surveys with counseling (f) student participation rate with STARFISH (f) Student persistence data correlated to counseling services (s) Student attainment data correlated to counseling services. (s)	 By Term Ongoing By Term By Term
5. To grow the Hispanic STEM student community within our colleges and reward behaviors that contribute to completion.	• Provide a physical location for STEM students to congregate, receive academic and student support, participate in co-curricular and extra-curricular activities, increase exposure to STEM-related topics, and develop a community and culture around STEM	6	**Research Focus:** *What effect did the various support initiatives have on building and improving our STEM student's intrinsic motivation to succeed?* CCSSE Survey (S) Student Satisfaction Surveys (f) Degree progression (s)	 Every other year Ongoing By Term

ADD GOAL HEADER WHEN DOCUMENT FINAL FOR END OF TABLE I

During the five-year period of this project, _____community college faculty members and counselors, _____Hispanic secondary students, and ____ Hispanic postsecondary students will be directly involved in project activities including recruiting workshops, staff development workshops, STEM instruction, enhanced student learning assistance workshops, counseling sessions and educational planning and degree audit processes. And, as mentioned in the data above, it will serve a disproportionally underserved and underrepresented group that is the priority of the NSF – HSI – STEM initiative.

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2. Timeline

The timeline below presents a summary of the major project activities. Upon grant award, the institutions will work with the Lead PI and Co-PI, the high schools and 4-year institutions, and the SBCCD Internal Monitoring Team to develop a detailed timeline to track project activities and outcomes by month.

	Year 1: 2018			Year 2: 2019			Year 3: 2020			Year 4: 2021			Year 5: 2022		
	Term			Term			Term			Term			Term		
Major Project Activities	**Sum**	**Fall**	**Spr**	**Sum**	**Fall**	**Spr**	**Sum**	**Fall**	**Spr**	**Sum**	**Fall**	**Spr**	**Sum**	**Fall**	**Spr**
Project Kick-Off Team Meetings		X													
Develop Recruitment Plan		X													
Informational Workshops			X		X	X		X	X		X	X		X	X
Career Exploration Workshops			X		X	X		X	X		X	X		X	X
Field Trips to STEM Industries					X	X		X	X		X	X		X	X
Incorporate Math Learning Technologies			X	X	X	X	X	X	X	X	X	X	X	X	X
Open Houses, Parent Orientations, Community Meetings					X			X			X			X	
Identify Articulation Gaps		X	X			X			X			X			X
Refine Program Maps			X			X			X			X			X

	Year 1: 2018			Year 2: 2019			Year 3: 2020			Year 4: 2021			Year 5: 2022		
Enhance Data Sharing		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Counselor Training and Shadowing			X		X			X			X			X	
Faculty Development in Contextualization			X			X			X			X			X
Contextualized Learning Workshops					X			X			X			X	
Embed Research Components in Curriculum					X	X	X	X	X	X	X	X	X	X	X
First-year Assistance Workshop		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Faculty Development in Instructional Technologies				X			X			X			X		
Expand Access to Laboratory Curriculum		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Embed Tutoring in Gateway Courses			X	X	X	X	X	X	X	X	X	X	X	X	X
Counselor and Student Meetings re Edu Plans			X	X	X	X	X	X	X	X	X	X	X	X	X
Implement Starfish		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Investigate Peer and Faculty Mentoring Program			X												
Explore STEM Professional Mentors				X											
Provide a Physical Location		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dissemination of Project Outcomes		X			X			X			X			X	
Final Evaluation of Objectives, Activities, and Outcomes.					X			X			X			X	

3. Management Plan

PI xxxx will handle the day-to-day management and coordinate the work with the Co-PIXXXXXX, external evaluator, grant staff development presenters, the STEM recruitment efforts at local high schools, the articulation initiatives with our four-year universities and the communication with the SBCCD Internal Monitoring Team to ensure achievement of project deliverables, annual progress reports, improvement efforts and dissemination of the developed research. PI xxxx will also manage the project budget in a separate, restricted account, which is overseen by SBCCD Vice Chancellor of Administrative Services, and will submit interim and final reports to NSF. In addition, the PI and Co-PI will meet with their respective college Executive Teams once a month to keep them informed and involved in the grant activity.

Internal Monitoring Teams (Table Xxxx and xxxxxxx)

Each of the colleges will develop an Internal Monitoring Team (IMT) that will consist of senior level staff, faculty, classified staff, and a representative from the external evaluator. Members of the IMT should have responsibilities outside the day to day but have a strong knowledge of their college's operations. The IMTs will meet quarterly and on an ad hoc basis as needed. The IMT member roles include facilitating strong communication between the grant and the institution, reviewing reports, recommending program adjustments and supervising the budget revisions. The PI will attend the performing institution's IMT and Co-PI will attend the collaborating institution's meetings and provide agendas and meeting outcomes.

Table XXXX
Internal Monitoring Team – Crafton Hills College

Member Name	Role and Responsibilities
Wei Zhou	**President**
Kathy Bahkit	Vice-President Instruction
Rebeccah Warren-Marlatt	Vice-President Student Services
Mike Strong	Vice-President of Administrative Services
Keith Wurtz	Dean Research and Effectiveness
Kirsten Colvey	Dean of Counseling
William Nuse	Dean STEM
Mark McConnell	President of CHC Academic Senate
Benjamin Gamboa	President of the Classified Senate

Table XXXXX
Internal Monitoring Team – San Bernardino Valley College

Member Name	Role and Responsibilities
Diana Rodriguez	President
Terri Long	Vice-President Instruction
Scott William Thayer	Vice-President Student Services
Scott Stark	Vice-President of Administrative Services
James Smith	Dean Research and Effectiveness
xxxxxx	Dean of Counseling
xxxxxxxx	Dean STEM

xxxxxx	President of SBVC Academic Senate
xxxxxxxx	President of SBVC Classified Senate

Activity Teams

Each objective of the project will have an activity team constituted that will develop a plan to research, design, analyze, evaluate and implement innovative or transformed activities that support achievement of the objective. Membership on these teams will consist of administrative, faculty and staff knowledgeable of current processes and specialists in the area of focus. In many cases, individuals from outside the college (e.g. high school staff, 4-year university staff, business and community leaders) will be added as necessary. Table XXX represents a list of the NSF STEM project activity teams:

Table XXXXX
SBCCD –NSF-STEM Project Activity Teams

Objective/Team	Membership Categories	Responsibilities
1. Outreach Team	High School representative; college outreach specialists, STEM faculty, counselors	Research best practices and innovations, design, analyze, evaluate and implement new activities in outreach that connect the college to the community in new and more effective ways.
2. Pathways Team	College academic and student services administrators and coordinators; 4-year representatives as required.	Research best practices and innovations, design, analyze, evaluate and implement new activities in structured STEM degree pathways in new and more effective ways.
3. Curriculum Innovations Team	College academic administrators, STEM faculty, college staff development coordinators.	Research best practices and innovations, design, analyze, evaluate and implement new activities in curriculum design and course pedagogies that improve content mastery and accelerate completion.
4. Learning Support Team	College academic administrators, STEM faculty, college staff development coordinators, learning support specialists.	Research best practices and innovations, design, analyze, evaluate and implement new activities in learning support systems that improve student success and promote stronger connections between faculty and student services.
5. Community Building and Motivational Team	College student services and student life specialists, STEM faculty,	Research best practices and innovations, design, analyze, evaluate and implement new activities in improving student's connection to the college, supporting intrinsic motivation and self-efficacy.

4. Roles and Responsibilities of Key Personnel

The following identifies the primary project responsibilities of the PI and Co-PI's.

Name	Primary Project Responsibility
PI -	Provide xxxxxxx
CoPI -	Serve xxxxx
CoPI -	Conduct xxxxxx
Consultant - Burt Peachy,	Perform external evaluation xxxxxxxx

5. Sustainability Plan

The SBCCD and the colleges are very cognizant of the fact that grant project outcomes need to be sustained beyond the period of the grant. To that end, the budget is developed with temporary compensation (stipends, overtime compensation) that terminate with the project. However, the processes and deliverables of the project will be embedded in ongoing operations that are in the general fund. In addition, we intend to realize an increase in student retention, persistence and graduation that will realize an improvement in our full-time equivalent student (FTES) apportionment funding from the State. This should more than support any new costs for training new staff, maintenance of software contracts, or supporting faculty travel to conferences to present our research findings.

6. Evaluation Plan

Must identify the external evaluator.

Evaluation Design Rationale The proposed evaluation plan will not only allow SBCCD to determine progress toward short- and mid-term objectives and long-term goals. It will also provide a mechanism to track progress toward achieving these outcomes through a process that allows for continual feedback and facilitates data/analysis-driven modifications to project strategies.

Specific evaluation strategies and techniques have been selected that will accurately and reliably measure outcomes of activity objectives and the direct impact they have on institutional goals and objectives.

Evaluation Plan Development – In developing a measurable, outcomes-based evaluation plan, SBCCD used the National Science Foundation's Evaluation Design Model as the basis for the plan design. Table x

Table X **Series of Questions to be Addressed**
1. Have SBCCD Hispanic STEM- directed students benefited from instructional and student services improvements as evidenced by increased retention and successful course completions?
2. Have SBCCD Hispanic STEM- directed students participating in revised STEM gateway courses increased their success as evidenced by increased successful completion rates?
3. Have faculty increased their knowledge and application of new instructional and support methodologies?
4. Has SBCCD realized increased FTES revenues in STEM programs as a result of project activities?
5. How and to what degree has the project helped to support SBCCD's Strategic Initiatives
6. How and to what extent has the project contributed to increased fall-to-fall persistence and overall graduation rates of STEM-directed students at SBCCD?

Add metrics and milestones description/table.

An outcomes-based logic model *(new table needed)* was created to clearly identify several key indicators of the project's success, successful course completion rates, semester-to-semester persistence, and degree completion. Through this process, we determined what instruments and data sources would be best suited for our project evaluation.

Evaluation tools will include faculty and student surveys and focus groups to gather qualitative data. Additionally, quantitative data**,** which can be measured against national benchmarks and longitudinally over time, will be collected on pre- and post-program measures such as grades, persistence, completion, and enrollment to indicate the degree of project success.

Data Analysis Techniques – A variety of data analysis techniques will be applied to data collected:
Quantitative Data (*e.g.,* descriptive statistics such as total counts, percentages, means, medians, averages) will be used both formatively and summatively to measure the incremental changes. These measures will also demonstrate the extent to which we have achieved activity objectives as well as point to needed modifications through a continuous improvement model.
Qualitative Data (*e.g.,* structured interviews, focus groups, observations) will be used to provide context and depth to the development of training programs, policies and procedures, and critical internal and external reports.
Statistical Analyses and linear trend analysis using sophisticated statistical software such as SPSS will be utilized by the SBCCD institutional research department to validate baseline data, compare past efforts to current activity, project possible outcomes based on trends identified by descriptive statistics, determine the extent of the impact of project activities on long-term institutional values such as attrition and graduation, and indicate areas of additional need.

Formative Evaluation Process: The formative evaluation will track whether the project is being conducted as planned and will monitor the short-term and annual results of activities. Formative evaluation determines the extent the project's goals and objectives are being met. This performance information will be used to influence program decision-making and resource allocation. Once the detailed evaluation plan is finalized, activities will be integrated into the project plan. The PI and Co-PI monitor the evaluation plan's activities and share formative evaluation reports twice a year with the project team to inform process improvements.

***Summative Evaluation Process**:* The summative evaluation will focus on gathering data from core team members, industry representatives, partners, and students to measure its effectiveness. Data will be collected through surveys and focus groups. In addition the SBCCD will provide the PI and Co-PI with end of term data on student performance, persistence rates and degree attainment (transfer ready) as both discrete information and trended data. Correlation studies will be requested as per the research focus of the project that can be used by project team members and college leadership for dissemination as appropriate. The logic table above *(table x)* illustrates the type of data and information that will be gathered and included in the annual reports.

Personnel Requirements – The PI will oversee data collection and reporting for project evaluation and, with assistance from the SBCCD staff, will provide data and information to be used for assessment of progress toward achieving objectives, identification of needed modifications to activity design (within federal guidelines), and measurement of the degree of impact on institutional goals and objectives.

External Evaluator – Compliance: An external consultant with extensive experience in grant compliance evaluations will be engaged for two onsite evaluation visits in the first year and one annual evaluation visit thereafter through the project period. The initial visit will require the evaluator to review documentation to ensure the grant team is adhering to applicable federal regulations, grant requirements, and ethical standards. Technical assistance will also be required through the five year partnership to maintain compliance to ensure the project and team members are audit ready. Evaluation services will include independent assessment, creation and submission of annual and internal interim reports, and technical consultation during the project. Annual evaluation reports will be submitted to the project director and IMT no later than November each year. For the first year only, a May onsite consultation is deemed necessary to assess the grant team's compliance with federal regulations and grant requirements followed by an interim compliance report due in June of that year.

External Evaluator – Project Analysis: A second external consultant will be engaged for an annual evaluation on-site visit during the month of September in all program years that follows the year-end date for the grant. In conjunction with the SBCCD grant staff, the project analysis evaluation plan will be implemented. The evaluation process will include an assessment to determine how the project is progressing towards meeting its goals and objectives along with the effectiveness of the conversion effort to engage learners and increase student success and completion. External evaluation services will include independent assessment, creating and submitting annual and internal interim reports, and technical consultation during the project. The evaluators will submit annual evaluation reports by November 15th and attend occasional evaluation-related meetings throughout the year. During the final year of the grant, in addition to the annual report, the evaluator will also develop a sustainability and integration plan to ensure the grant initiatives are institutionalized into the Colleges strategic and operational culture. The sustainability and integration plan will include next steps in improvement and strategic priorities for the College.

Internal Monitoring Team: The IMT as outlined in the management plan will be appointed by each of the college presidents to consist of key college staff primarily external to the project. The members will share responsibility for evaluating the implementation efforts of the project

director, goal activity leads, staff, and faculty working on project. The evaluation plan will allow for continuous feedback and identification of unanticipated outcomes in a timely manner so that staff may make appropriate adjustments and modifications thereby ensuring continued and increased project success and overall goal attainment.

7. Dissemination Plan

This project, being evidence-based research focused, will produce five research papers, co-authored by our XXXXX PI and XXXXXXX Co-PI as its summary deliverable. Each of these papers will highlight on the findings associated with the focus of the objective (e.g. innovative recruitment strategies that increase Hispanic enrollment in college STEM programs). In turn that research will be offered to several professional associations that would promote this work, such as the Hispanic Association of Colleges and Universities, The American Association of Community Colleges, or The League for Innovation in the Community Colleges as either conference presentations or publications.

8. Results from Prior NSF Support

The PI and CoPI"s of this project have not received any public funding directly related to this project however, San Bernardino Valley College was previously funded for a NSF ATE project called **Bridging the Water Divide: Training a New Generation of Water Technicians** (1203200: $199,273 from 7/1/12 to 12/31/16). This ATE project developed curriculum in partnership with industry partners while expanding internship opportunities for students.

Intellectual merit outcomes: Based on evaluation reports, the Bridging the Water Divide: Training a New Generation of Water Technicians project quadrupled the number of student internships, from 16 to 87 students in four years. The program also engaged nine additional industry members, an increase from six to join the Inland Valley Water Council formerly called the Inland Valley Water Consortium. The coursework prepared students to upgrade their skills and/or prepare them for licensing examinations and certifications from the California State Water Resource Control Board, the American Water Works Association, and the California Water Environment Association. *(Need faculty findings/evaluation of the project)*

Broader impact outcomes: As a result of the Bridging the Water Divide: Training a New Generation of Water Technician project, San Bernardino Valley College now offers a Water Supply Technology certificate program. The Water Supply Technology program brings the needed awareness to conserving water due to extreme drought conditions in California. The program also prepares students for jobs in the water industry while prepar4ing them to pass the industry certification examinations. *(Need statistics of student completion rates, job placement, certifications).*

ENDNOTES FOR CITATIONS PAGES

[1] Redlands Daily Facts..citation
[2] NY Times Citation
[3] 2016 United States Census QuickFacts
[4] Cite Source
[5] (Occupation Overview: EMSI Q4 2017 Data Set, February 2018)
[6] Need to cite source
[7] Cite source
[8] Cite source
[9] Cite Source
[10] Cite Source
[11] (CCCCO MIS Datamart)
[12] (CCCCO MIS Datamart)
[13] (EMSI).Economic Modeling Specialists Labor Market Data fo Higher Education