U.S. Department of Education
Grant Performance Report (ED 524B)
Project Status Chart

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SECTION A - Performance Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

1. Project Objective **[ ]** Check if this is a status update for the previous budget period.

Improve the academic achievement of Hispanic and low-income students in engineering and computer science fields.

1.a. Performance Measure	Measure Type	Quantitative Data						
		Target				Actual Performance Data		
The percent of Hispanic and low-income students* who participated in grant-supported services or programs who successfully completed gateway courses.	Program or Project	Institution**	Raw Number	Ratio	%	Raw Number	Ratio	%
		CSUN***		/			115/129	89
		COC****		/			35/45	78
		GCC*****		/			2/2	100
		MC******		/			39/55	71
		PC*******		/			/	79

***Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient)**
**** CSUN: California State University, Northridge; COC: College of the Canyons; GCC: Glendale Community College; MC: Moorpark College; PC: Los Angeles Pierce College**
*****CSUN gateway courses for first-time freshmen students are CE 240, ECE 240, COMP 110, CIT 160, ME 209, MSE 227, MATH 150 A/L. CSUN gateway courses for first-time transfer students are AM 316, CE 340, ME 370, MSE 304, ECE 340/L, ECE 350, ECE 320/L, MSE 362, MSE 402, COMP 333, COMP 322/L, COMP 380/L, CIT 270/L, CIT 360.**
******COC gateway courses are BIOSCI-106, BIOSCI-204, CMPNET-151, CMPSCI-111, MATH-025, MATH-026, MATH-058, MATH-083, MATH-102, MATH-103, MATH-211, MATH-212, MATH-213, PHYSIC-220**
*******GCC gateway courses are CS/IS 135, Engineering 152, Engineering 156, Engineering 240, Math 103, Physics 101**
********MC gateway courses are ENGR M01; ENGR M04; ENGR M12+Lab; ENGR M16; ENGR M20+Lab; PHYS M20A+Lab; PHYS M20B+Lab; PHYS M20C+Lab; MATH M25A; MATH M25B; MATH M25C; CHEM M01A or CHEM M01AH**
*********PC gateway courses are CoSci 575, Math 260, Math 261, Math 262, Physics 101, Physics 102**

1.b. Performance Measure	Measure Type	Quantitative Data						
		Target				Actual Performance Data		
The percent of Hispanic and low-income students* who participated in grant-supported services or programs in good academic standing.	Program or Project	Institution**	Raw Number	Ratio	%	Raw Number	Ratio	%
		CSUN***		/			31/34****	91
		COC*****		/			64/65	98
		GCC******		/			10/10	100
		MC*******		/			22/25	88
		PC********		/			114/123	93

***Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient)**
**** CSUN: California State University, Northridge; COC: College of the Canyons; GCC: Glendale Community College; MC: Moorpark College; PC: Los Angeles Pierce College**
*****CSUN students are in good standing at the conclusion of any matriculated term in which they have both a cumulative total GPA and a CSUN GPA of 2.0 or higher**
*******Discrepancies in the number of CSUN students who participated in grant-supported services or programs exist due to the missing data from data source files (e.g., survey data files) and/or fluctuations in student participation over time.**

*******COC students are in good standing at the conclusion of any matriculated term in which they have a cumulative COC GPA of 2.0 or higher**
********GCC academic good standing is the absence of probation status at the end of a semester. Probation is defined as either a cumulative GPA less than 2.0 (academic probation) and/or at least 50% of units resulting in grades of No Pass, Incomplete, or Withdrawal (progress probation)**
*********MC students are in good standing if they have at least a cumulative 2.00 Grade Point Average (GPA) and complete at least 50% of the units attempted.**
**********PC academic good standing is defined as a cumulative GPA of 2.0 or above**

1.c. Performance Measure	**Measure Type**	**Quantitative Data**					
		Target			**Actual Performance Data**		
Improvements in student success (non-cognitive) skills.	**Program or Project**	**Raw Number**	**Ratio**	**%**	**Raw Number**	**Ratio**	**%**
			/			/	

Explanation of Progress (Include Qualitative Data and Data Collection Information)

Evaluation Data Sources and Methods for the Objective

CSUN, College of the Canyons (COC), Glendale Community College (GCC), Moorpark College (MC), and Los Angeles Pierce College (PC) report their respective data sources and methods pertaining to performance measures 1a and 1b below.

Evaluation Data Sources and Methods at CSUN

CSUN faculty mentors and/or project leadership worked with project staff to identify the gateway courses for CSUN first-year students listed in Table 1 and the gateway courses for CSUN transfer students in Table 2. The gateway courses outlined in Tables 1 and 2 are courses in which CSUN first-year and transfer students, respectively, generally enroll in engineering and computer science majors. Furthermore, with respect to performance measure 1b, CSUN students are in good standing at the conclusion of any matriculated term in which they have both a cumulative total GPA and a CSUN GPA of 2.0 or higher. With both gateway courses and good academic standing defined, we then worked with CSUN's Office of Institutional Research to produce the 2016-17 course completion (1a) and academic standing (1b) data for Hispanic and low-income students in engineering and computer science fields in the AIMS2 project.

Table 1: CSUN First-Year Gateway Courses

Course Name and Number	**Course Title**
CE 240	Engineering Statics
CIT 160 (/L)	Internet Technologies
COMP 110 (/L)	Introduction to Algorithms and Programming (and Lab)
ECE 240 (/L)	Electrical Engineering Fundamentals (and Lab)
MATH 150 A/L	Calculus I
ME 209	Programming for Mechanical Engineers
MSE 227 (/L)	Engineering Materials (and Lab)

Table 2: CSUN Transfer Student Gateway Courses

Course Name and Number	**Course Title**
AM 316	Engineering Dynamics
CE 340	Strength of Materials

COMP 333	Concepts of Programming Languages
COMP 322/L	Introduction to Operating Systems and System Architecture and Lab
COMP 380/L	Introduction to Software Engineering and Lab
CIT 270/L	Integrative Programming
CIT 360	CIT System Management and Lab
ECE 340/L	Electronics I and Lab
ECE 350	Linear Systems
ECE 320/L	Theory of Digital Systems and Lab
ME 370	Thermodynamics
MSE 304	Engineering Economic Analysis
MSE 362	Engineering Statistical Applications
MSE 402	Engineering Project Management

Evaluation Data Sources and Methods at COC

College of the Canyons faculty and project staff identified gateway courses (1a) listed in Table 3. Furthermore, with respect to performance measure 1b, COC students are in good standing at the conclusion of any matriculated term in which they have a cumulative COC GPA of 2.0 or higher. With both gateway courses and good academic standing defined, course completion (1a) and academic standing (1b) data were monitored and produced with the assistance of COC's Office of Institutional Research.

Table 3: College of the Canyons Gateway Courses

Course Name and Number	Course Title
BIOSCI-106	Organismal & Environmental Biology
BIOSCI-204	Human Anatomy and Physiology I
CMPNET-151	CCNA Prep 1
CMPSCI-111	Introduction to Algorithms and Programming/JAVA
MATH-025	Arithmetic
MATH-026	Arithmetic mCAL (math Computer Assisted Learning)
MATH-058	Algebra Preparation
MATH-083	Geometry
MATH-102	Trigonometry
MATH-103	College Algebra
MATH-211	Calculus I
MATH-212	Calculus II
MATH-213	Calculus III
PHYSIC-220	Physics for Scientists and Engineers: Mechanics of Solids and Fluids

Evaluation Data Sources and Methods at GCC

Glendale Community College faculty and project staff identified gateway courses listed in Table 4. Furthermore, with respect to performance measure 1b, academic good standing at GCC is the absence of probation status at the end of a semester. Probation is defined as either a cumulative GPA less than 2.0 (academic probation) and/or at least 50% of units resulting in grades of No Pass, Incomplete, or Withdrawal (progress probation). With both gateway courses and good academic standing defined, course completion (1a) and academic standing (1b) data were monitored and produced with the assistance of GCC's Office of Institutional Research.

Table 4: Glendale Community College Gateway Courses

Course Name and Number	Course Title
CS/IS 135	Programming C++
Engineering 152	Engineering Mechanics-Statics
Engineering 156	Programming and Problem Solving in MATLAB
Engineering 240	Electrical Engineering Fundamentals
Math 103	Calculus and Analytic Geometry
Physics 101	Engineering Physics

Evaluation Data Sources and Methods at MC

As part of the process, Moorpark College faculty and project staff identified gateway courses listed in Table 5. Furthermore, with respect to performance measure 1b, Moorpark students are in good academic standing if they have at least a cumulative 2.00 Grade Point Average (GPA) and complete at least 50% of the units attempted. With both gateway courses and good academic standing defined, course completion (1a) and academic standing (1b) data were monitored and produced with the assistance of MC's Office of Institutional Research.

Table 5: Moorpark College Gateway Courses

Course Name and Number	Course Title
ENGR M01	Introduction to Engineering
ENGR M04	Engineering Design / CAD
ENGR M12 + Lab	Engineering Materials
ENGR M16	Engineering Statics & Strength of Materials
ENGR M20 + Lab	Electrical Engineering Fundamentals
PHYS M20A + Lab	Mechanics of Solids & Fluids
PHYS M20B + Lab	Thermodynamics, Electricity, & Magnetism
PHYS M20C + Lab	Wave Motion, Optics & Modern Physics
MATH M25A	Calculus with Analytic Geometry I
MATH M25B	Calculus with Analytic Geometry II
MATH M25C	Calculus with Analytic Geometry III
CHEM M01A (or M01AH)	General Chemistry I (Honors)

Evaluation Data Sources and Methods at PC

Los Angeles Pierce College faculty and project staff identified gateway courses listed in Table 6. Of those outlined in Table 6, Math 260, 261, 262, and CoSci 575 are considered gateway courses due to their high enrollment and low success rate, while Physics 101 and 102 are considered gateway courses because they are required classes for all engineering majors. Furthermore, with respect to performance measure 1b, academic good standing at PC is defined as a cumulative GPA of 2.0 or above. With both gateway courses and good academic standing defined, course completion (1a) and academic standing (1b) data were monitored and produced with the assistance of PC's Office of Institutional Research.

Table 6: Pierce College Gateway Courses

Course Name and Number	Course Title
CoSci 575	Programming Fundamentals for Computer Science

Math 260	Pre-calculus
Math 261	Calculus I
Math 262	Calculus II
Physics 101	Physics for Scientists and Engineers I
Physics 102	Physics for Scientists and Engineers II

Evaluation Data Sources and Methods for Performance Measure 1c

We have explored improvements in student success skills (1c) with results from the Engineering Majors Survey (EMS)--an online survey questionnaire—and group interviews (i.e., focus groups). More specifically, CSUN collected data on student academic and professional interests, academic experiences and plan, and career goals related to innovation and entrepreneurship through the EMS. The EMS is a project of Stanford University's Epicenter (National Center for Engineering Pathways to Innovation). Working with consultant colleagues from Epicenter, we adapted the EMS to AIMS^2's unique project contexts (e.g., project objectives, performance measures, and activities) [From EMS: Several sections of this survey are based on the Engineering Majors Survey, developed as part of the NSF-funded Epicenter (2011-16) and co-managed by Stanford University and VentureWell. These sections have been adapted with permission from the survey authors; these sections are used under the Creative Common's Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license. You can view the license here: http://creativecommons.org/licenses/by-nc-sa/4.0/).] As part of adapting the EMS survey, we added two career-related items from the Professional Engineering Pathways Study (PEPS) survey [(Brunhaver, S., Matusovich, H., Sheppard, S., & Streveler, R. (2016). *2016 Professional Engineering Pathways Survey.* Available by request.]. With the EMS, we use a pretest/posttest online survey administration with students who participate in grant-supported services and those who do not participate. We surveyed project participants in late Spring/Summer 2018 and Fall 2017 (and plan to survey comparison group students) so that we can understand the cohort holistically and use comparative measures to understand program effect. Each cohort and control group will be surveyed twice (at a minimum)—once at the project entry (pretest) and once each year (annually) until project exit (posttest). We used the late Spring/Summer 2017 pretest survey administration as a pilot with the F-1 cohort, resulting in minor updates to the EMS survey instrument. In the Fall 2017 term, we surveyed T-1, F-2, and T-1 cohort students. That is, we sent the EMS to first-project year first-time transfer cohort (T-1), second project-year first-time freshman cohort (F-2) and second project-year first-time transfer cohort (T-2) in Fall 2017, and a comparison group we will be surveyed in Spring 2018. These results will be reported in next year's APR. For this year's APR, the pretest for the first-time freshman (F-1) cohort and first-time transfer (T-1) cohort in Year 1 at CSUN was completed by 19 students (n=19) in the Spring/Summer 2017 and Fall 2017 semesters. Results of the pretest survey for the first-time freshman cohort (F-1) and first-time transfer cohort (T-1) are reported in the next section "Description of Preliminary Findings Related to the Objective."

For the student focus groups, students from CSUN and Moorpark College were invited to group interviews in an effort to explore how participation shapes student experiences and outcomes. Focus group participants were recruited from a pool of students identified by staff as participants in grant-supported services and programs. A protocol was developed to ask students to reflect on their experiences in the program. The focus groups have been led by the program evaluators in this first year of the grant period. These focus groups were audio recorded and hand-written notes were taken during the discussion. With focus group data collection anticipated in the Spring/Summer 2018 terms, we plan to report these data in the next annual performance report.

<u>Description of Preliminary Findings Related to the Objective</u>

Preliminary findings for each college are reported below.

Preliminary Findings of CSUN for Performance Measure 1a and 1b

During the first performance period, when we examine actual performance data for the first performance measure (1a), we find that 89% (115/129) of the gateway courses attempted were successfully completed. In other words, of the 34 students who participated in grant-supported services, those students attempted a total of 129 gateway courses. Of those 129 gateway courses attempted, 115 of them were successfully completed, or passed with a C- or higher. Although we note that while a C- or higher allows a student to move on to the next course in most instances, there are some exceptions. For example, COMP 110/L (a noted freshman gateway course) requires a grade of C or better before students can move on to the subsequent courses. Also, earning numerous C-'s could eventually lead to academic probation. Moving on to performance measure 1b, of the participants who participated in grant-supported services or programs, 91% (31/34) of those participants were in good academic standing.

Preliminary Findings of COC for Performance Measure 1a and 1b

During the performance period, a total of 65 students from College of the Canyons participated in grant-supported services or programs. Of those 65 student participants, 45 enrolled in at least one gateway course as defined in the section above. The actual performance data indicate that the percent of students who successfully completed gateway courses is 78% (35/45). Furthermore, when we examine the actual performance data for academic achievement (1b), we find that 98% (64/65) of Hispanic and low-income students who participated in grant-supported services or programs are in good academic standing.

Preliminary Findings of GCC for Performance Measure 1a and 1b

During the performance period, when we examine actual performance data for the first performance measure (1a), we find that 100% (2/2) of the gateway courses attempted were successfully completed. In other words, of the 10 Hispanic and low-income students who participated in grant-supported services, those students attempted a total of 2 gateway courses. Of those 2 gateway courses attempted, 2 of them were successfully completed. It is helpful to note that at GCC, gateway course success is defined as the percentage of enrollments resulting in grades of A, B, C, or Pass (unsuccessful enrollments resulted in grades of D, F, No Pass, or Withdrawal). When we turn to academic achievement (1b), we find that 100% (10/10) of Hispanic and low-income students who participated in grant-supported services or programs are in good academic standing.

Preliminary Findings of MC for Performance Measure 1a and 1b

During the first performance period, when we examine actual performance data for the first performance measure (1a), we find that 71% (39/55) of the gateway courses attempted were successfully completed. In other words, of the 25 students who participated in grant-supported services, those students attempted a total of 55 gateway courses. Of those 55 gateway courses attempted, 39 of them were successfully completed. With performance measure 1b, of the Hispanic and low-income students who participated in grant-supported services or programs at Moorpark College, 88% (22/25) of those participants are in good academic standing.

Preliminary Findings of PC for Performance Measure 1a and 1b

In the first project performance period, actual performance data for the first performance measure (1a) demonstrate that 79% of Hispanic and low-income students who participated in grant-supported services or programs at Pierce College successfully completed gateway courses. Further, data for performance measure 1b show that 93% (114/123) of Hispanic and low-income students who participated in grant-supported services or programs are in good academic standing.

Preliminary Findings for Performance Measure 1c

To measure improvements in student success (non-cognitive) skills (performance measure 1c), the EMS posed a question intended to have students examine their engineering task self-efficacy, which serves as a predictor of academic performance and engineering task self-efficacy as a facet of a larger measure achievement profile. This question given to students asked: How confident are you in your ability to do each of the following at this time: design a new product or project to meet specified requirements; conduct experiments, build prototypes, or construct mathematical models to develop or evaluate a design; develop and integrate component sub-systems to build a complete system or product; analyze the operation or functional performance of a complete system; and troubleshoot a failure of a technical component or system. The response set included the following scaled items: not confident, slightly confident, moderately confident, very confident, extremely confident, and I prefer not to answer. The following table outlines the survey results.

Table 7: (EMS): How confident are you in your ability to do each of the following at this time?*

	Not Confident		Slightly Confident		Moderately Confident		Very Confident		Extremely Confident		I Prefer Not to Answer	
	n	%	n	%	n	%	n	%	n	%	n	%
Design a new product or project to meet specific requirements	2	11.1	3	16.7	7	38.9	5	27.8	1	5.6	0	0
Conduct experiments, build prototypes, or construct mathematical models to develop or evaluate a design	1	5.6	4	22.2	9	50.0	2	11.1	2	11.1	0	0
Develop and integrate component sub-systems to build a complete system or product	3	16.7	4	22.2	8	44.4	3	16.7	0	0	0	0
Analyze the operation of functional performance of a complete system	2	11.1	3	16.7	8	44.4	3	16.7	1	5.6	1	5.6
Troubleshoot a failure of a technical component or system	2	11.1	4	22.2	5	27.8	4	22.2	2	11.1	1	5.6

***Table presents items with missing data**

For the first project year, the EMS was completed by 19 first-time freshmen (F-1) and first-time transfer (T-1) CSUN students participating in grant-supported services or programs. When asked how confident are you in your ability to conduct experiments, build prototypes, or construct mathematical models to develop or evaluate a design, 4 (22.2%) of the respondents reported being very or extremely confident. Overall, the item with the lowest percentage of respondents reported feeling very or extremely confident is: develop and integrate component sub-systems to build a complete system or product. Conversely, the areas the greatest percentage of respondents reported as very or extremely confident were: design a new product or project to meet specific requirements and troubleshoot a failure of a technical component or system.

Description of Project Activities Related to the Objective

Currently faculty and staff are working to provide programs and services that will help students successfully complete their gateway courses as well as maintain good academic standing and improve student success. CSUN has established monthly meetings for all student participants as an opportunity to present students with helpful information and resources. The first monthly meeting took place on October 13, 2017, with a panel discussion titled "Perspectives from Industry Leaders." In addition, project activities across all institutions include tutoring, mentoring, textbook award programs, study skills/orientation (CSUN), calculus lab (CSUN), first-time freshman math workshop (CSUN), academic excellence workshops (COC), journal club (COC), workshop on how to develop a student education plan (GCC), a learning workshop for math (GCC), and team building activities (MC) (please see "Description of Project Activities Related to the Objective" for objective 2 for more details).

Plans to Use of Performance Data to Monitor Progress

With data provided by the respective institutional research offices at COC, GCC, MC, PC, and CSUN, we have reported actual course completion and academic standing data from the 2016-17 academic year. Given that student cohorts began in Spring 2017, the EMS online survey pretest occurred during the first project year and we reported actual performance data on these objectives. Specifically, we used institutional data to assess further progress on the first and second performance measures (1a and 1b) and the EMS to evaluate progress on the third performance measure (1c). Our plans to use data collected through these procedures include discussions of the results in project meetings to address areas of improvement.

SECTION A - Performance Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

2. Project Objective **[ ]** Check if this is a status update for the previous budget period.

Enhance faculty and peer environments for Hispanic and low-income students in engineering and computer science fields.

2.a. Performance Measure	Measure Type	Quantitative Data						
		Baseline***				Actual Performance Data		
		Institution****	Raw Number	Ratio	%	Raw Number	Ratio	%
The number* of Hispanic and low-income students** participating in grant-funded student support programs or services.	Program or Project	CSUN	17	/		32*****	/	
		COC	23	/		65	/	
		GCC	10	/		10	/	
		MC	25	/		25	/	
		PC	230	/		123	/	

***Number is defined as the frequency count of student participants in the current project year**
****Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient) students eligible to participate in grant-supported programs and services**
*****Baseline data taken from the Actual Performance Data of the Interim Performance Report (April 2017)**
****** CSUN: California State University, Northridge; COC: College of the Canyons; GCC: Glendale Community College; MC: Moorpark College; PC: Los Angeles Pierce College**
*******Discrepancies in the number of CSUN students who participated in grant-supported services or programs exist due to the missing data from data source files (e.g., survey data files) and/or fluctuations in student participation over time.**

2.b. Performance Measure	Measure Type	Quantitative Data					
		Target			Actual Performance Data		
		Raw Number	Ratio	%	Raw Number	Ratio	%
Improvements in self-reports of quality, quantity, and effects of student-faculty and peer-peer interaction.	Program or Project		/			/	

Explanation of Progress (Include Qualitative Data and Data Collection Information)

Evaluation Data Sources and Methods for the Objective

CSUN, College of the Canyons, Glendale Community College, Moorpark College, and Los Angeles Pierce College report their respective data sources and methods pertaining to performance measure 2a below.

Evaluation Data Sources and Methods at CSUN
CSUN collected data on student participation in through one-on-one advising and faculty mentor group meetings. See "Description of Project Activities Related to the Objective" for details on faculty mentor group meetings.

Evaluation Data Sources and Methods at College of the Canyons
College of the Canyons collected data on student participation through attendance in student meetings. See "Description of Project Activities Related to the Objective" for details on student meetings.

Evaluation Data Sources and Methods at Glendale Community College
Glendale Community College collected data on student participation through student attendance and participation in biweekly workshop participation. See "Description of Project Activities Related to the Objective" for details on biweekly workshops.

Evaluation Data Sources and Methods at Moorpark College
Moorpark College collected data on student participation through student attendance of biweekly meetings. See "Description of Project Activities Related to the Objective" for details on biweekly meetings.

Evaluation Data Sources and Methods at Los Angeles Pierce College
Los Angeles Pierce College collected data on student participation through participation in tutoring workshops. See "Description of Project Activities Related to the Objective" for details on tutoring workshops. Specifically, students who enrolled in the following courses, where tutors were funded in Spring 2017/Summer 2017, were classified as project participants: Physics 101 (sections 0591, 0574, and 3318), Physics 102 (sections 8371 and 0663), or Physics 103 (section 3317) in Spring 2017; or CS 575 (sections 1510, 1511) in Summer 2017.

Evaluation Data Sources and Methods for Performance Measure 2b
Monitoring performance on the quality, quantity, and the effects of student-faculty and peer-peer interaction (2b) included use of results from the Engineering Majors Survey (EMS) and the Undergraduate Research Student Self-Assessment (URSSA)—both are online survey instruments—and group interviews (i.e., focus groups). Specifically, in late Spring/Summer 2017 and Fall 2017, CSUN collected data on contact between students and faculty and among students on the frequency of discussions related to courses, careers, and design ideas.

The EMS is a project of Stanford University's Epicenter (National Center for Engineering Pathways to Innovation). Working with consultant colleagues from Epicenter, we adapted the EMS to AIMS^2's unique project contexts (e.g., project objectives, performance measures, and activities) [From EMS: Several sections of this survey are based on the Engineering Majors Survey, developed as part of the NSF-funded Epicenter (2011-16) and co-managed by Stanford University and VentureWell. These sections have been adapted with permission from the survey authors; these sections are used under the Creative Common's Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license. You can view the license here: http://creativecommons.org/licenses/by-nc-sa/4.0/.] As part of adapting the EMS survey, we added two career-related items from the Professional Engineering Pathways Study (PEPS) survey [(Brunhaver, S., Matusovich, H., Sheppard, S., & Streveler, R. (2016). *2016 Professional Engineering Pathways Survey.* Available by request.]. With the EMS, we use a pretest/posttest online survey administration with both students who participate in grant-supported services and those students who do not participate. We surveyed project participants in late Spring/Summer 2018 and Fall 2017 (and plan to survey comparison group students) so that we can understand the cohort holistically and use comparative measures to understand program effect. Each cohort and control group will be surveyed twice (at a minimum)—once at the project entry (pretest) and once each year (annually) until project exit (posttest). We used the late Spring/Summer 2017 pretest survey administration as a pilot with the F-1 cohort, resulting in minor updates to the EMS survey instrument. In the Fall 2017 term, we surveyed T-1, F-2, and T-1 cohort students. That is, we sent the EMS to first-project year first-time transfer cohort (T-1), second project-year first-time freshman cohort (F-2) and second project-year first-time transfer cohort (T-2) in Fall 2017, and a comparison group we will be surveyed in Spring 2018. These results will be reported in next year's APR. For this year's APR, the pretest for the first-time freshman (F-1) cohort and first-time transfer (T-1) cohort in Year 1 at CSUN was completed by 19 students (n=19) in the Spring/Summer 2017 and Fall 2017 semesters. Results of the pretest survey for the first-time freshman cohort (F-1) and first-time transfer cohort (T-1) are reported in the next section "Description of Preliminary Findings Related to the Objective."

The Undergraduate Research Student Self-Assessment (URSSA) is a survey instrument developed by the University of Colorado at Boulder and currently housed at the Student Assessment of Their Learning Goals (SALG) site (https://salgsite.net). [From the URSSA site: Development and testing of URSSA has been supported by the National Science Foundation through its Divisions of Chemistry and Undergraduate Education, the Biological Sciences Directorate, and the Office of Multidisciplinary Affairs, under grant #CHE-0548488.] URSSA asks respondents about their experiences and outcomes related to undergraduate research participation. In the AIMS^2 project, we administered URSSA online to research assistants who participated in summer research with faculty mentors in Summer 2017—with a total of 14 respondents completing a survey. Summer research assistants may have been community college students, CSUN students, or students at other CSU campuses (who recently transferred or would transfer from a community college to a CSU campus other than CSUN). Results of URSSA survey administration are reported in the next section "Description of Preliminary Findings Related to the Objective."

For the student focus groups, students from CSUN and Moorpark College were invited to group interviews in an effort to explore how participation shapes student experiences and outcomes. Focus group participants were recruited from a pool of students identified by staff as participants in grant-supported services and programs. A protocol was developed to ask students to reflect on their experiences in the program. The focus groups have been led by the program evaluators in this first year of the grant period. These focus groups were audio recorded and hand-written notes were taken during the discussion. With focus group data collection anticipated in the Spring/Summer 2018 terms, we plan to report these data in the next annual performance report.

Description of Preliminary Findings Related to the Objective
Preliminary findings for each college are reported below.

Preliminary Findings of CSUN
CSUN collected data on student participation and reports that 32 first-time freshmen and first-time transfer students have participated in grant-funded support programs or services. Below are three tables that note the demographics for the first project-year first-time freshman cohort (F-1) and first project-year first-time transfer cohort (T-1). The first identifies the sex of the participants. It is helpful to note that the following demographic tables were completed with missing data from data source files. This pattern explains the difference in the number of student participants in the following demographic tables (n=33) and the number noted above in the table for performance objective 2a (n=32).

Table 8: Freshman Cohort 1 and Transfer Cohort 1 - Sex

	First-Time Freshman Cohort 1 (F-1)		First-Time Transfer Cohort 1 (T-1)	
	x	%	x	%
Male	9	69	15	75
Female	4	31	5	25
Other	0	0	0	0
Total*	13	100	20	100

*Discrepancies in the number of CSUN students who participated in grant-supported services or programs exist due to the missing data from data source files (e.g., survey data files) and/or fluctuations in student participation over time.

The following table identifies the racial or ethnic identity of the participants.

Table 9: Freshman Cohort 1 and Transfer Cohort 1 - Racial or Ethnic Identification

	First-Time Freshman Cohort 1 (F-1)		First-Time Transfer Cohort 1 (T-1)	
	x	%	x	%
American Indian or Alaska Native	0	0	0	0
Asian or Asian American	2	15	4	20
Black or African American	0	0	3	15
Hispanic or Latino/a	10	77	8	40
Native Hawaiian or Pacific Islander	0	0	0	0
White	1	8	3	15
Not Specific	0	0	0	0
Other	0	0	2	10
Total*	13	100	20	100

*Discrepancies in the number of CSUN students who participated in grant-supported services or programs exist due to the missing data from data source files (e.g., survey data files) and/or fluctuations in student participation over time.

Finally, this last demographic table notes the Pell Grant status of the participants in the first freshman cohort and the first transfer cohort. This is the measure used to determine low-income student status.

Table 10: Freshman Cohort 1 and Transfer Cohort 1 - Pell Grant

	First-Time Freshman Cohort 1 (F-1)		First-Time Transfer Cohort 1 (T-1)	
	x	%	x	%
Yes	10	77	17	85
No	2	15	1	5
Subsidized Loan	0	0	2	10
Other	1	8	0	0
Total*	13	100	20	100

*Discrepancies in the number of CSUN students who participated in grant-supported services or programs exist due to the missing data from data source files (e.g., survey data files) and/or fluctuations in student participation over time.

Preliminary Findings of College of the Canyons

Data were collected from participation in student meetings. Based on this participation, it is reported that 65 students have participated in grant-funded support programs or services.

Preliminary Findings of Glendale Community College

With the establishment of a new cohort, and through tracking of participation in biweekly workshops, Glendale Community College reports that 10 students have participated in grant-funded support programs.

Preliminary Findings of Moorpark College

Through student cohort participation in biweekly meetings, Moorpark College reports that 25 students have participated in grant-funded support programs or services.

Preliminary Findings of Los Angeles Pierce College

With the establishment of tutoring made available to physics and computer science course sections, Los Angeles Pierce College reports that 123 students have been served. This is the total number of students served through grant-funded support programs. Specifically, students who enrolled in the following courses, where tutors were funded in Spring 2017/Summer 2017, were classified as project participants: Physics 101 (sections 0591, 0574, and 3318), Physics 102 (sections 8371 and 0663), or Physics 103 (section 3317) in Spring 2017; or CS 575 (sections 1510, 1511) in Summer 2017.

Preliminary Findings for Performance Measure 2b

In the current performance period, a total of 13 students were given the opportunity to participate in the first project-year first-time freshman cohort. The EMS pretest survey for the first project-year first-time freshman cohort (F-1) and first project-year first-time transfer cohort (T-1) at CSUN was completed by 19 students in the late Spring/Summer 2017 (F-1) and Fall 2017 (T-1) semesters. To measure improvements in self-reports of quality, quantity, and effects of student-faculty and peer-peer interaction, the EMS posed two questions for the first project-year first-time freshman cohort at CSUN. The first being, in the past year, how often have you discussed each of the following with faculty members at your institution: course topics and assignments (not during class or section time); your professional options with an engineering degree; and new design or business ideas? Participants were given the choice of responding never, rarely, sometimes, often, very often, or I prefer not to answer. The table below presents results.

Table 11 (EMS): In the past year, how often have you discussed each of the following with faculty members at your institution?

	Never		Rarely		Sometimes		Often		Very Often		I Prefer Not to Answer	
	n	%	n	%	n	%	n	%	n	%	n	%
Course topics and assignments (not during class or section time)	1	5.3	2	10.5	8	42.1	5	26.3	3	15.8	0	0
Your professional options with an engineering degree	2	10.5	5	26.3	6	31.6	3	15.8	3	15.8	0	0
New design or business ideas	6	31.6	2	10.5	6	31.6	2	10.5	2	10.5	1	5.3

The results reveal that 8 (42.1%) respondents have never or rarely discussed a new design or business idea with faculty members, while 21% of respondents (n=14) often or very often discussed this topic with faculty members. Similarly, 7 (36.8%) respondents never or rarely discussed their professional options with an engineering degree with their faculty members, but 6 (31.6%) often or very often discussed the same topic with faculty members. The greatest percentage of respondents (42.1%) sometimes discussed course-related topics with faculty members.

The second question related to this performance measure is, in the past year, how often have you discussed each of the following with other students: course topics and assignments (not during class or section time); your professional options with an engineering degree; and new design or business ideas? Participants were given the choice of responding never, rarely, sometimes, often, very often, or I prefer not to answer. The table below presents results.

Table 12: (EMS): In the past year, how often have you discussed each of the following with other students?

	Never		Rarely		Sometimes		Often		Very Often		I Prefer Not to Answer	
	n	%	n	%	n	%	n	%	n	%	n	%
Course topics and assignments (not during class or section time)	1	5.3	3	15.8	2	10.5	5	26.3	8	42.1	0	0
Your professional options with an engineering degree	1	5.3	3	15.8	6	31.6	5	26.3	4	21.1	0	0
New design or business ideas	4	21.1	6	31.6	5	26.3	2	10.5	2	10.5	0	0

Actual data show that 13 (68.4%) respondents have often or very often discussed course topics and assignments (not during class or section time) with other students. Additionally, almost half (47.4%) of the respondents have often or very often discussed professional options with an engineering degree with other students, and a smaller percentage of respondents (21%) discussed new design or business idea often or very often with other students.

In the current performance period, a total of 37 students were provided the opportunity to interact with CSUN faculty through their participation in the Summer 2017 research program. The URSSA survey was distributed at the end of the summer term, and 14 summer research participants elected to participate. Three questions focused on improvements in self-reports of quality, quantity, and effects of student-faculty and peer-peer interaction. The first question asked participants, how satisfied were you with the following aspects of the AIMS^2 research program: ease in working with a faculty research mentor; support and guidance from my faculty research mentor; and support and guidance from other research group members. Participants were given the choice of responding not applicable, very dissatisfied, somewhat dissatisfied, somewhat satisfied, and very satisfied. The table below presents results.

Table 13 (URSSA): How satisfied were you with the following aspects of the AIMS2 research program?

	Not Applicable		Very Dissatisfied		Somewhat Dissatisfied		Somewhat Satisfied		Very Satisfied	
	n	%	n	%	n	%	n	%	n	%
Ease in working with a faculty research mentor	0	0	1	7.1	2	14.3	5	35.7	6	42.9
Support and guidance from my faculty research mentor	0	0	1	7.1	2	14.3	4	28.6	7	50.0
Support and guidance from other research group members	1	7.1	0	0	2	14.3	4	28.6	7	50.0

Data show that 11 (78.6%) of the respondents were somewhat satisfied or very satisfied with the support and guidance from their faculty mentor and from other research group members.

The second URSSA question asked participants, what motivated you to do research? The table below presents results.

Table 14 (URSSA): Question: What motivated you to do research?

	Yes		No	
	x	%	n	%
Work more closely with a particular faculty member	10	71.4	4	28.6

The results reveal that 10 (71.4%) of the respondents report that they were motivated to do research to work more closely with a particular faculty member.

The final question in the URSSA related to improvements in self-reports of quality, quantity, and effects of student-faculty and peer-peer interaction is, on average, how many hours per week did you spend talking with your most recent faculty research mentor? The table below presents results.

Table 15 (URSSA): On average, how many hours per week did you spend talking with your most recent faculty research mentor?

	None		1 Hour		2 Hours		3 Hours		4 or More Hours	
	n	%	n	%	n	%	n	%	n	%
Hours per week with most recent faculty research mentor	1	7.1	5	35.7	5	35.7	2	14.3	1	7.1

Actual data show that 10 (71.4%) of the respondents spent one or two hours per week talking with their most recent faculty mentor.

<u>Description of Project Activities Related to the Objective</u>

Specific project activities at CSUN, College of the Canyons, Glendale Community College, Moorpark College, and Los Angeles Pierce College, respectively, are detailed below.

Project Activities at CSUN

Faculty and staff have been working to institute many programs and activities in support of the first-time freshman and first-time transfer cohorts. On September 22, 2017, CSUN hosted a program orientation for all new freshman and transfer student participants. Additionally, CSUN has established monthly meetings for all student participants as an opportunity to present students with helpful information and resources. The first monthly meeting took place on October 13, 2017, with a panel

discussion titled "Perspectives from Industry Leaders." Additional programming has included the establishment of a peer-tutoring component to the program. In particular, in January-February 2017, we recruited and hired peer tutors from CSUN's upper-division undergraduate and graduate students in the College of Engineering and Computer Science. Students were surveyed to determine in which courses tutoring would be provided. Furthermore, faculty were asked which courses they thought students would benefit the most from with additional peer tutors. Beginning in the Fall 2017 semester, tutoring was made available to transfer students in the following high (DUF) courses: AM 316, CE 240, CIT 160, COMP 110, COMP 122, COMP 182, COMP 282, ECE 240, ECE 320, ECE 350, ME 209, ME 335, ME 370, MSE 227. In addition to peer tutoring, faculty mentors were assigned to each cohort student, and these faculty mentors have instituted small group meetings with cohort participants. These meetings support student-faculty interaction and student development, and are also intended to facilitate peer-peer interaction. Additionally, faculty mentors meet with students on a regular basis one-on-one to discuss their academic performance and help them with advising.

Furthermore, project faculty and staff planned a study skills/orientation, and specialized math workshops. CSUN faculty worked to create a study skills/orientation workshop that took place in Summer 2017. As a week-long program during CSUN's summer orientation, faculty mentors facilitated customized workshops to help first time freshman (FTF) entering the College of Engineering and Computer Science. The topics covered in the customized workshops included a welcome to engineering, concerns about being an engineer, setting student goals in engineering, what is a study plan, preparing for class, learning strategies, managing your finances, and a tour of the engineering labs, etc. As a complimentary summer program, CSUN faculty created a math workshop for first-time freshman (FTF) that also took place during Summer 2017. The goal was to support and accelerate students' progress through the math course sequence. Utilizing the Math Selection Assessment (MSA) online system and weekly face to face tutoring support, students participated in a four to six week workshop over the summer in preparation of the Math Placement Test (MPT). The MPT is used to determine eligibility to enroll in specific math courses and is required for all incoming freshmen. Through adequate preparation for the MPT, students had the potential to be better prepared with the likelihood of testing to their full capability. This has the potential to improve student retention and ultimately graduation rates. In addition, CSUN faculty have also worked to create a calculus lab which enhances the materials and instruction for one section of a Calculus 150A lab. Calculus 150A is a math prerequisite course for all majors in the College of Engineering and Computer Science. Students met weekly with faculty and a teaching assistant (TA) to review the lesson for the week and were provided with additional examples and hands on technology (Geogebra). Geogebra is mathematics software that brings together geometry, spreadsheets, graphing, statistics, and calculus, and was set-up for the TA to use during class as a demo and for students to use both during and outside of class.

Project Activities at College of the Canyons

Project activities at College of the Canyons have included a journal club, in which students met with a professional scientist/engineer from NASA Armstrong and discussed current scientific and technological articles. COC also hosts monthly student meetings where students have the opportunity to learn more about study skills, internship opportunities, scholarship opportunities, current trends in research, and future workshops, with a format open to questions and discussions with peers. During one of these monthly student meetings, CSUN faculty hosted an information session. Also offered are weekly Academic Excellence Workshops, where students develop and refine study and test taking skills for academic success in their current STEM courses under the guidance of a trained facilitator. Workshops are primarily offered in calculus and chemistry. In addition to these recurring meetings and workshops, students were also invited to attend special lectures exposing students to how our global economy will affect our future in the STEM field, and how various STEM majors fit into civic engagement through discussion with peers and faculty. College of the Canyons also sponsored students to attend the Society of Hispanic Professional Engineers (SHPE) Regional Conference. This conference aims to foster an environment to accelerate and enhance leadership, management, and technical skills.

Project Activities at Glendale Community College

During the course of the project, students at Glendale Community College have been supplemented with workshops that cover many topics relevant to student success. These topics have included a welcome orientation to help students create a sense of community, time dedicated to developing a student education plan that includes transfer options, an introduction to the career center that explains how to prepare a resume and what to expect at a conference, and a math workshop. In addition, students were given the task of working with other campus student organizations to organize an annual Maker Faire Conference. This conference showcases original projects from students and industry professionals from Los Angeles County. Finally, Glendale Community College sponsored students to attend the Society of Hispanic Professional Engineers (SHPE) Regional Conference. This conference aims to foster an environment to accelerate and enhance leadership, management, and technical skills.

Project Activities at Moorpark College

Project activities at Moorpark College have included team building activities. These team building activities take place during biweekly meetings which include workshops, guest speakers from industry and academia, field trips, peer-tutoring, and review sessions. Workshops include the following topics: Counseling to help with developing an education plan, study skills, time management, stress identification and reduction, and resume and cover letter writing. In addition to workshops, guest speakers from industry and academia have helped students understand different engineering disciplines and occupations within the field and how their education can help them realize their dreams. These guest speakers have also served as role models for some students and have helped them make some professional connections. Additionally, field trips were arranged so that students could see first-hand what some engineers do on the job and be inspired. Then after the hour-long workshops mentioned above, students form groups and work on common subjects that they have difficulty with or need help with. In these groups, students help one another while a facilitator is also available to help students with questions. Due to the popularity of these tutoring sessions, the program is exploring the possibility of hiring a dedicated student tutor. In addition to participation in the biweekly team building activities, students were informed of various summer research opportunities available at CSUN and Moorpark College, and other research opportunities were sought for students, including opportunities at California State University, Channel Islands. Also, students were expected to join an engineering organization and attend at least one local meeting per semester. And finally, students used their resume writing and cover letter writing skills to apply to at least one engineering internship opportunity. While not required to secure an internship, this exercise was an important way for students to gain some real-world experience and learn some soft-skills to help them find a job once they graduate.

Project Activities at Los Angeles Pierce College

Project activities at Los Angeles Pierce College have included peer tutoring offered for one engineering course section and six calculus-based physics course sections in Fall 2016, three Physics 101 sections, two Physics 102 sections, and one Physics 103 section in Spring 2017, and two CS 575 sections in Summer 2017. During this performance period, weekly help sessions were established for these various course sections to assist students with completing assignments and preparing for exams. Additionally, a Career Guidance Counselor Assistant (CGCA) created workshops for students on topics such as study skills and resume building. The CGCA has also worked to facilitate student support activities, such as coordinating guest speakers and a field trip to CSUN research laboratories.

Plans to Use of Performance Data to Monitor Progress

Data collection for both performance measures (2a and 2b) took place during the first project year. Given that the second performance measure (2b) relates to quality, plans to monitor performance has included the use of results from the EMS and URSSA online survey questionnaires and group interviews (i.e., participant focus groups. We will use results from program data, the EMS, URSSA, and interviews to monitor progress on meeting this objective. Specifically, we plan to use program data to assess further progress on the first performance measure (2a) and the EMS, URSSA, and group interviews to evaluate progress on the second performance measure (2b). Our plans to use data collected through these procedures include discussions of the results in project meetings to address areas of improvement.

SECTION A - Performance Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

3. Project Objective **[ ]** Check if this is a status update for the previous budget period.

Improve the transfer of Hispanic and low-income students in engineering and computer science fields to baccalaureate-granting institutions.

3.a. Performance Measure	Measure Type	Quantitative Data						
		Baseline				Actual Performance Data		
		Institution***	Raw Number	Ratio	% Change	Raw Number	Ratio	% Change
The percentage change, over the five-year grant period, of the number of Hispanic and low-income*, full-time** STEM field degree-seeking undergraduate students enrolled.	Program or Project	CSUN****	1670	/		1679	/	0.5
		COC*****	287	/		286	/	-0.4
		GCC******	336	/		373	/	11
		MC*******	351	/		379	/	8
		PC********	564	/		520	/	-8

***Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient) students**
****Full-time enrollment for undergraduate students is enrollment in 12 or more units**
*****CSUN: California State University, Northridge; COC: College of the Canyons; GCC: Glendale Community College; MC: Moorpark College; PC: Los Angeles Pierce College**
******Degree seeking STEM fields at CSUN include all of the majors in the College of Engineering and Computer Science and select majors in the College of Science and Mathematics, which include Mathematics, Physics, and Chemistry**
*******Degree seeking STEM fields at COC include: Biological & Physical Sciences; Biological Sciences; Computer Applications; Computer Networking; Computer Science; Engineering; Mathematics; Physics; Geography; and Geology**
********Degree seeking STEM fields at GCC include: Physics; Biology; Biological Science; Comp Appl Specialist; Comp Appl Tech; Computer Engineer Tech; Computer Info Systems; Computer Operator; Computer Programmer; Computer Repair Tech; Computer Science; Computer Software Tech; Computer Support Tech; Engineering/E-M Design; Electronics Engineer Tech; Electronics TechnlgyTech; Electo/Mech Fabrication; MMT: Machinist; Mathematics; Physical Science; Science and Mathematics; Computer Aided Manufacturing; Computer Operations Technician; Computer Programming Tech; EMD-Drafting/CAD; Drafting/E-Mech Design; Electronics and Computer Tech; E&CT-Automation Systems Tech; ECT-Computer Repair; ECT-Computer Systems; EMD-Electronic; ECT-Electronics Tech; Electronics Technician; CIS-Large System Computing; M&MT-Manufacturing Technician; CIS-Microcomputer; Micro Comp Repair Technician; Micro Comp Software Operator; Manufacturing Engineer; EMD-Mechanical; CIS-Programming; Science**
*********Degree seeking STEM fields at MC include all engineering majors who have identified a educational goal to transfer, with or without having received an AA/AS**
**********Degree seeking STEM fields at PC include: Environmental Science and Technology; Website Development, Programming and Scripting; Routing Technology; Certificate of Achievement in Website Development; Personal Computer Service Technology; Programming for Business; Programming for Computer Science; Computer and Network Technology; Microcomputer Service Technology; Networking Technology; Network Technology; Routing Technology; Personal Computer Service Technology; Computer & Information Sciences – Transfer; Digital Electronics; Electronics; Electronics – Analog; Electronics – Digital; Electronics and Electric Technology; Engineering & Related Industrial Tech – Transfer; Engineering Graphics and Design Technology; Mathematics; Mathematics – Transfer; Mathematics for Transfer; Microcomputer Service Technology; Personal Computer Service Technology; Physical Sciences – Transfer; Physics; Physics for Transfer; Pre-Engineering; Gen. Studies (Science, Technology, Engineering & Math); and Science, Technology, Engineering and Mathematics**

3.b. Performance Measure	Measure Type	Quantitative Data						
The percentage of Hispanic and low-income*, first-time STEM field degree-seeking undergraduate students who were in their first year of postsecondary enrollment** in the previous year and are enrolled in the current year who remain in a STEM field degree/credential program.	**Program or Project**	**Baseline**				**Actual Performance Data**		
		Institu-tion* **	**Raw Number**	**Ratio**	**%**	**Raw Number**	**Ratio**	**%**
		CSUN** **		**553/689**	**80**		**494/551**	**90**
		COC*** **		**73/213**	**34**		**169/287**	**59**
		GCC**** **		**194/300**	**65**		**197/359**	**55**
		MC***** **		**75/100**	**75**		**65/86**	**76**
		PC****** **		**83/224**	**37**		**107/189**	**57**

***Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient) students**
****First year of postsecondary enrollment is defined as first-time, first-year enrollment**
*****CSUN: California State University, Northridge; COC: College of the Canyons; GCC: Glendale Community College; MC: Moorpark College; PC: Los Angeles Pierce College**
******Degree seeking and STEM fields at CSUN include all of the majors in the College of Engineering and Computer Science and select majors in the College of Science and Mathematics, which include Mathematics, Physics, and Chemistry**
*******Degree seeking and STEM fields at COC include: Biological & Physical Sciences; Biological Sciences; Computer Applications; Computer Networking; Computer Science; Engineering; Mathematics; Physics; Geography; and Geology**
********Degree seeking STEM fields at GCC include: Physics; Biology; Biological Science; Comp Appl Specialist; Comp Appl Tech; Computer Engineer Tech; Computer Info Systems; Computer Operator; Computer Programmer; Computer Repair Tech; Computer Science; Computer Software Tech; Computer Support Tech; Engineering/E-M Design; Electronics Engineer Tech; Electronics TechnlgyTech; Electo/Mech Fabrication; MMT: Machinist; Mathematics; Physical Science; Science and Mathematics; Computer Aided Manufacturing; Computer Operations Technician; Computer Programming Tech; EMD-Drafting/CAD; Drafting/E-Mech Design; Electronics and Computer Tech; E&CT-Automation Systems Tech; ECT-Computer Repair; ECT-Computer Systems; EMD-Electronic; ECT-Electronics Tech; Electronics Technician; CIS-Large System Computing; M&MT-Manufacturing Technician; CIS-Microcomputer; Micro Comp Repair Technician; Micro Comp Software Operator; Manufacturing Engineer; EMD-Mechanical; CIS-Programming; Science**
*********Degree seeking STEM fields at MC include engineering majors**
**********Degree seeking STEM fields at PC include: Environmental Science and Technology; Website Development, Programming and Scripting; Routing Technology; Certificate of Achievement in Website Development; Personal Computer Service Technology; Programming for Business; Programming for Computer Science; Computer and Network Technology; Microcomputer Service Technology; Networking Technology; Network Technology; Routing Technology; Personal Computer Service Technology; Computer & Information Sciences – Transfer; Digital Electronics; Electronics; Electronics – Analog; Electronics – Digital; Electronics and Electric Technology; Engineering & Related Industrial Tech – Transfer; Engineering Graphics and Design Technology; Mathematics; Mathematics – Transfer; Mathematics for Transfer; Microcomputer Service Technology; Personal Computer Service Technology; Physical Sciences – Transfer; Physics; Physics for Transfer; Pre-Engineering; Gen. Studies (Science, Technology, Engineering & Math); and Science, Technology, Engineering and Mathematics**

Explanation of Progress (Include Qualitative Data and Data Collection Information)

Evaluation Data Sources and Methods for the Objective

We have worked with CSUN's Office of Institutional Research, as well as the respective institutional research offices/units for College of the Canyons, Glendale Community College, Moorpark College, and Los Angeles Pierce College to produce the 2016-17 enrollment (3a) and STEM retention (3b) data for Hispanic and low-income students in engineering and computer science fields.

Description of Preliminary Findings Related to the Objective

Preliminary findings for each college are reported below.

Preliminary Findings of CSUN

CSUN collected enrollment data (3a) for the number of Hispanic and low-income, full-time STEM field degree-seeking undergraduate students using CSUN COUNTS (https://www.csun.edu/counts/), a website supported by CSUN's Office of Institutional Research. Through this dashboard, the following conditions were selected: Characteristics of Current Students; All Current Undergraduate Students; College of Engineering & Computer Science and the College of Science & Mathematics; Ethnicity Latina/o; Pell Grant Yes; Attendance Status Full-Time. Then enrollment data of students meeting these conditions were displayed from Fall 2011 through Fall 2016. Based on the requirements of performance measure 3a, Fall 2015 was used as the pre-project baseline year, and Fall 2016 is the Year 1 actual performance data for the project. The number of Hispanic and low-income, full-time STEM field degree-seeking undergraduate students at CSUN in Fall 2016 was 1,679. These results reflect a 1% increase from the Fall 2015 enrollment (n=1,670).

For performance measure 3b, the baseline measure used the 2014-15 enrollment data of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students who were in their first year of postsecondary enrollment—compared to the 2015-16 enrollment data to determine the percentage of those students who remained in a STEM field degree/credential program. The number of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate student who were in their first year of postsecondary enrollment in the 2014-15 academic year was 689. And the number of students who remained in 2015-16 and continued to meet the criteria was 553. These data establish a baseline measure of 80% (553/689). When we interpret actual performance data, we see that 551 Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students were in their first year of postsecondary enrollment in the 2015-16 academic year, and 494 of those students continued into the 2016-17 academic year. These data yield a 90% (494/551) retention rate. In relation to the baseline measure of 80%, the percentage has increased.

Preliminary Findings of COC

For performance measure 3a, in the 2015-16 academic year, 287 Hispanic and low-income, full-time STEM field degree-seeking undergraduate students were enrolled at College of the Canyons. In the following 2016-17 academic year, 286 students who met the same criteria were enrolled, leading to a slight percentage decrease of -0.4%.

For performance measure 3b, the baseline measure used the 2014-15 enrollment data of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students who were in their first year of postsecondary enrollment and comparing it to the 2015-16 enrollment data to determine the percentage of those students who remained in a STEM field degree/credential program. The number of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate student who were in their first year of postsecondary enrollment in the 2014-15 academic year was 213. Meanwhile, the number of students who remained in 2015-16 and continued to meet the criteria was 73. These figures establish a baseline measure of 34% (73/213). When we interpret actual performance data, we see that 287 Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students were in their first year of postsecondary enrollment in the 2015-16 academic year, and 169 of those students continued into the 2016-17 academic year. This pattern yields a 59% (169/287) retention rate. Compared to the baseline of 34%, the percentage has increased substantially.

Preliminary Findings of GCC

At Glendale Community College, in the 2015-16 academic year, 336 Hispanic and low-income, full-time STEM field degree-seeking undergraduate students were enrolled. In the following 2016-17 academic year, 373 students fitting the same criteria were enrolled, leading to a percentage increase of 11%.

For performance measure 3b, the baseline was determined by using the 2014-15 enrollment data of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students who were in their first year of postsecondary enrollment and comparing it to the 2015-16 enrollment data to determine the percentage of those students who remained in a STEM field degree/credential program. The number of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate student who were in their first year of postsecondary enrollment in the 2014-15 academic year was 300. Subsequently, the number of students who remained in 2015-16 and continued to meet the criteria was 194. These data establish a baseline measure of 65%. When we interpret actual performance data, we see that 359 Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students were in their first year of postsecondary enrollment in the 2015-16 academic year, and 197 of those students continued into the 2016-17 academic year. This pattern yields a 55% retention rate. Compared to the baseline of 65%, the percentage has decreased.

Preliminary Findings of MC

In the 2015-16 academic year, 351 Hispanic and low-income, full-time STEM field degree-seeking undergraduate students were enrolled at Moorpark College. Later, in the 2016-17 academic year, 379 students meeting the same criteria were enrolled, leading to a percentage increase of 8%.

For performance measure 3b, the baseline was determined by using the 2014-15 enrollment data of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students who were in their first year of postsecondary enrollment and comparing it to the 2015-16 enrollment data to determine the percentage of those students who remained in a STEM field degree/credential program. The number of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate student who were in their first year of postsecondary enrollment in the 2014-15 academic year was 100. And the number of students who remained in 2015-16 and continued to meet the criteria was 75. Taken together, these figures establish a baseline of 75%. When we interpret actual performance data, we see that 86 Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students were in their first year of postsecondary enrollment in the 2015-16 academic year, and 65 of those students continued into the 2016-17 academic year. These data yield a 76% retention rate. When compared to the baseline of 75%, the percentage has increased slightly.

Preliminary Findings of PC

At Los Angeles Pierce College, in the 2015-16 academic year, 564 Hispanic and low-income, full-time STEM field degree-seeking undergraduate students were enrolled. Then in the 2016-17 academic year, 520 students fitting the same criteria were enrolled, leading to a percentage decrease of -8%.

For performance measure 3b, the baseline was determined by using the 2014-15 enrollment data of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students who were in their first year of postsecondary enrollment and comparing it to the 2015-16 enrollment data to determine the percentage of those students who remained in a STEM field degree/credential program. The number of Hispanic and low-income, first-time STEM field degree-seeking, undergraduate student who were in their first year of postsecondary enrollment in the 2014-15 academic year was 224. And the number of students who remained in 2015-16 and continued to meet the criteria was 83. This pattern informs a baseline measure of 37%. When we interpret actual performance data, we see that 189 Hispanic and low-income, first-time STEM field degree-seeking, undergraduate students were in their first year of postsecondary enrollment in the 2015-16 academic year, and 107 of those students continued into the 2016-17 academic year. Here, you can see a 57% retention rate from these data. In relation to the baseline of 37%, the percentage has increased substantially.

Description of Project Activities Related to the Objective

Project faculty and staff have developed and implemented project activities that support the achievement of this objective through work with cohort participants at CSUN, College of the Canyons, Glendale Community College, Los Angeles Pierce College, and Moorpark College. Project activities across all institutions include tutoring, mentoring, textbook award programs, team building activities (Los Angeles Pierce College), academic excellence workshops (College of the Canyons), attendance of College Day at UC Riverside (College of the Canyons), and sponsorship of students to attend the Society of Hispanic Professional Engineering (SHPE) Regional Conference (College of the Canyons and Glendale Community College) (please see "Description of Project Activities Related to the Objective" for objective 2 for more details). In addition, project faculty at CSUN, College of the Canyons, Glendale Community College, Los Angeles Pierce College, and Moorpark College are working collaboratively to support early contact and connections between community college students and CSUN, including summer research opportunities, CSUN faculty speaking events at College of the Canyons, Los Angeles Pierce College student tours of CSUN engineering laboratories, and community college cohort attendance at CSUN's Project Design Showcase. Also, CSUN has established monthly meetings for all student participants as an opportunity to present students with helpful information and resources. The first monthly meeting took place on October 13, 2017, with a panel discussion titled "Perspectives from Industry Leaders." Future meetings will be open to all community college participants as well.

Plans to Use of Performance Data to Monitor Progress

With data provided by the Offices of Institutional Research on student enrollment and STEM retention, we have calculated the actual performance data for this measure. Our plan to use data collected through this procedure includes discussions of the results in project meetings to address areas of improvement.

SECTION A - Performance Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

4. Project Objective **[ ]** Check if this is a status update for the previous budget period.

Improve career preparation of Hispanic and low-income students in engineering and computer science fields.

4.a. Performance Measure	Measure Type	Quantitative Data					
		Target			Actual Performance Data		
		Raw Number	Ratio	%	Raw Number	Ratio	%
Gains on measures of self-perceptions, attitudes, and skills related to career.	Program or Project						

Explanation of Progress (Include Qualitative Data and Data Collection Information)

Evaluation Data Sources and Methods for the Objective

Investigating gains on measures related to career preparation, we used results from the Engineering Majors Survey (EMS) and the Undergraduate Research Student Self-Assessment (URSSA)—both online survey questionnaires—and group interviews (i.e., focus groups). Specifically, in late Spring/Summer 2017 and Fall 2017, CSUN collected data on the importance of work involving engineering tasks (EMS), entrepreneurial engineering tasks (EMS), likelihood of working in sector of employment in an engineering field (EMS), likelihood of working in the engineering field (EMS), likelihood of entering graduate school (EMS), and agreement with items about the relationship between research participation and career preparation (URSSA).

The EMS is a project of Stanford University's Epicenter (National Center for Engineering Pathways to Innovation). Working with consultant colleagues from Epicenter, we adapted the EMS to AIMS^2's unique project contexts (e.g., project objectives, performance measures, and activities) [From EMS: Several sections of this survey are based on the Engineering Majors Survey, developed as part of the NSF-funded Epicenter (2011-16) and co-managed by Stanford University and VentureWell. These sections have been adapted with permission from the survey authors; these sections are used under the Creative Common's Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license. You can view the license here: http://creativecommons.org/licenses/by-nc-sa/4.0/).] As part of adapting the EMS survey, we added two career-related items from the Professional Engineering Pathways Study (PEPS) survey [(Brunhaver, S., Matusovich, H., Sheppard, S., & Streveler, R. (2016). *2016 Professional Engineering Pathways Survey.* Available by request.]. With the EMS, we use a pretest/posttest online survey administration with both students who participate in grant-supported services and those students who do not participate. We surveyed project participants in late Spring/Summer 2018 and Fall 2017 (and plan to survey comparison group students) so that we can understand the cohort holistically and use comparative measures to understand program effect. Each cohort and control group will be surveyed twice (at a minimum)—once at the project entry (pretest) and once each year (annually) until project exit (posttest). We used the late Spring/Summer 2017 pretest survey administration as a pilot with the F-1 cohort, resulting in minor updates to the EMS survey instrument. In the Fall 2017 term, we surveyed T-1, F-2, and T-1 cohort students. That is, we sent the EMS to first-project year first-time transfer cohort (T-1), second project-year first-time freshman cohort (F-2) and second project-year first-time transfer cohort (T-2) in Fall 2017, and a comparison group we will be surveyed in Spring 2018. These results will be

reported in next year's APR. For this year's APR, the pretest for the first-time freshman (F-1) cohort and first-time transfer (T-1) cohort in Year 1 at CSUN was completed by 19 students (n=19) in the Spring/Summer 2017 and Fall 2017 semesters. Results of the pretest for the first-time freshman cohort (F-1) and first-time transfer cohort (T-1) are reported in the next section "Description of Preliminary Findings Related to the Objective."

URSSA is an online survey instrument developed by the University of Colorado at Boulder and currently housed at the Student Assessment of Their Learning Goals (SALG) site (https://salgsite.net). [From the URSSA site: Development and testing of URSSA has been supported by the National Science Foundation through its Divisions of Chemistry and Undergraduate Education, the Biological Sciences Directorate, and the Office of Multidisciplinary Affairs, under grant #CHE-0548488.] URSSA asks respondents about their experiences and outcomes related to undergraduate research participation. In the AIMS^2 project, we administered URSSA online to research assistants who participated in summer research with faculty mentors in Summer 2017—with a total of 14 respondents completing a survey. Summer research assistants may have been community college students, CSUN students, or students at other CSU campuses (who recently transferred or would transfer from a community college to a CSU campus other than CSUN). Results of URSSA survey administration are reported in the next section "Description of Preliminary Findings Related to the Objective."

For the student focus groups, students from CSUN and Moorpark College were invited to group interviews in an effort to explore how participation shapes student experiences and outcomes. Focus group participants were recruited from a pool of students identified by staff as participants in grant-supported services and programs. A protocol was developed to ask students to reflect on their experiences in the program. The focus groups have been led by the program evaluators in this first year of the grant period. These focus groups were audio recorded and hand-written notes were taken during the discussion. With focus group data collection anticipated in the Spring/Summer 2018 terms, we plan to report these data in the next annual performance report.

Description of Preliminary Findings Related to the Objective
Cohort data are reported here for the objective.

In the current performance period at the time of the EMS survey administrations periods in late Spring/Summer 2017 and Fall 2017, a total of 33 students (a student headcount that fluctuated over the course of the first project year) participated in the first project-year first-time freshman and first-time transfer cohorts. A final sample of 19 respondents completed an EMS pretest survey. To measure gains on measures of self-perceptions, attitudes, and skills related to career, the EMS posed several questions for the first project-year first-time freshman and first-time transfer cohorts at CSUN. The first question that we identified for reporting here is: How important is it to you to be involved in the following job or work activities in the first five years after you graduate: searching out new technologies, processes, techniques, and/or product ideas; generating creative ideas; promoting and championing ideas to others; investigating and securing resources needed to implement new ideas; developing adequate plans and schedules for the implementation of new ideas; and selling product or service in the marketplace Participants were given the choice of responding not important, slightly important, moderately important, very important, extremely important, or I prefer not to answer. The table below presents results.

Table 16 (EMS): How important is it to you to be involved in the following job or work activities in the first five years after you graduate?*

	Not Important		Slightly Important		Moderately Important		Very Important		Extremely Important		I Prefer Not to Answer	
	n	%	n	%	n	%	n	%	n	%	n	%
Searching out new technologies, processes, techniques, and/or product ideas	1	5.6	1	5.6	4	22.2	7	38.9	5	27.8	0	0
Generating creative ideas	1	5.6	0	0	6	33.3	4	22.2	7	38.9	0	0
Promoting and championing ideas to others	1	5.6	0	0	4	22.2	9	50.0	4	22.2	0	0
Investigating and securing resources needed to implement new ideas	1	5.6	0	0	5	27.8	7	38.9	5	27.8	0	0
Developing adequate plans and schedules for the implementation of new ideas	1	5.6	0	0	5	27.8	8	44.4	4	22.2	0	0
Selling product or service in the marketplace	1	5.6	2	10.5	6	33.3	6	33.3	3	16.7	0	0

***Table presents items with missing data.**

EMS results reveal that greatest percentage of respondents (72.2%) find it very important or extremely important to be involved in promoting or championing ideas to others in the first five years after they graduate. Three items where the second highest percentage of respondents (66.7%) find it very important or extremely important to be involved in searching out new technologies, processes, techniques, and/or product ideas; investigating and securing resources needed to implement new ideas; and developing adequate plans and schedule for the implementation of new ideas in the first five years after graduation.

The second question that we identified for reporting on gains on measure of self-perceptions, attitudes, and skills related to career is: How important is it to you to be involved in the following job or work activities in the first five years after you graduate/next five years: designing a new product or project to meet specified requirements; conducting experiments, build prototypes, or construct mathematical models to develop or evaluate a design; developing and integrating component sub-systems to build a complete system or products; analyzing the operation or functional performance of a complete system; and troubleshooting a failure of a technical component or system. Participants responded to a scaled response set that included not important, slightly important, moderately important, very important, extremely important, or I prefer not to answer. The table below presents results.

Table 17 (EMS): How important is it to you to be involved in the following job or work activities in the first five years after you graduate/next five years?

	Not Important		Slightly Important		Moderately Important		Very Important		Extremely Important		I Prefer Not to Answer	
	n	%	n	%	n	%	n	%	n	%	n	%
Designing a new product or project to meet specified requirements	1	5.6	2	11.1	6	33.3	9	50.0	0	0	0	0
Conducting experiments, build prototypes, or construct mathematical models to develop or evaluate a design	1	5.6	1	5.6	6	33.3	10	55.6	0	0	0	0
Developing and integrating component sub-systems to build a complete system or products	1	5.6	0	0	10	55.6	7	38.9	0	0	0	0
Analyzing the operation or functional performance of a complete system	2	11.1	0	0	7	38.9	9	50.0	0	0	0	0
Troubleshooting a failure of a technical component or system	2	11.1	0	0	9	50.0	7	38.9	0	0	0	0

Results reveal that a greater percentage of respondents find it very or extremely important to be involved in conducting experiments, build prototypes, or construct mathematical models to develop or evaluate a design (55.6%); designing a new product or project to meet specified requirements (50%); and analyzing the operation or functional performance of a complete system (50%) in the first five years after they graduate/next five years. The lowest percentage of respondents find it very or extremely important to be involved in developing and integrating component sub-systems to build a complete system or products (38.9%) and troubleshooting a failure of a technical component or system (38.9%).

We note here that, when responses in Table 16 (innovative/entrepreneurial work in engineering) are compared to responses in Table 17 (engineering work tasks), a greater percentage of respondents find it very important or extremely important to be involved in more innovative or entrepreneurial work in engineering (e.g., promoting or championing ideas to others and searching out new technologies, processes, techniques, and/or product ideas) than engineering work (e.g., designing a new product or project to meet specified requirements or developing and integrating component sub-systems to build a complete system or products) in the first five years after they graduate.

The third question in the EMS used to assess this performance measure (gains related to career) is: How likely is it that you will do each of the following in the first five years after you graduate: work as an employee for a small business or start-up company; work as an employee for a medium- or large-size business; work as an employee for a non-profit organization (excluding a school or college/university); work as an employee for the government, military, or public agency (excluding a school or college/university); work as a teacher or educational professional in a K-12 school; work as a faculty member or educational professional in a college or university; found or start your own for-profit organization; and found or start your own non-profit organization. Participants had the choice of responding definitely will not, probably will not, might or might not, probably will, definitely will, or I prefer not to answer. The table below presents results.

Table 18 (EMS): How likely is it that you will do each of the following in the first five years after you graduate?

	Definitely Will Not		Probably Will Not		Might or Might Not		Probably Will		Definitely Will		I Prefer Not to Answer	
	n	%	n	%	n	%	n	%	n	%	n	%
Work as an employee for a small business or start-up company	1	5.6	2	11.1	10	55.6	4	22.2	1	5.6	0	0
Work as an employee for a medium- or large-size business	1	5.6	0	0	5	27.8	11	61.1	1	5.6	0	0
Work as an employee for a non-profit organization (excluding a school or college/university)	1	5.6	2	11.1	8	44.4	6	33.3	1	5.6	0	0
Work as an employee for the government, military, or public agency (excluding a school or college/university)	1	5.6	1	5.6	7	38.9	8	44.4	1	5.6	0	0
Work as a teacher or educational professional in a K-12 school	3	16.7	4	22.2	7	38.9	3	16.7	1	5.6	0	0
Work as a faculty member or educational professional in a college or university	3	16.7	3	16.7	8	44.4	3	16.7	1	5.6	0	0
Found or start your own for-profit organization	1	5.6	2	11.1	10	55.6	2	11.1	3	16.7	0	0
Found or start your own non-profit organization	1	5.6	3	16.7	8	44.4	4	22.2	2	11.1	0	0

For this question, results reveal that the greatest percentage of respondents (66.7%) probably or definitely will work as an employee for a medium- or large-size business in the first five years after they graduate. Half of respondents (50%) reported that they probably or definitely will work as an employee for the government, military, or public agency (excluding a school or college/university). In contrast, the lowest percentage of respondents reported that they probably or definitely will work as a teacher or educational professional in a K-12 school (22.2%) or work as a faculty member or educational professional in a college or university (22.2%) in the first five years after they graduate.

The fourth question related to gains on career-related measures is, how likely is it that your work will involve engineering (e.g., engineering practice, research, management, or sales) in: the first year after you graduate; five years after you graduate; and ten years after you graduate. Response set of participants included the following scaled items: definitely will not, probably will not, might or might not, probably will, definitely will, or I prefer not to answer. The table below presents results.

Table 19 (EMS): How likely is it that your work will involve engineering (e.g., engineering practice, research, management, or sales) in…

	Definitely Will Not		Probably Will Not		Might or Might Not		Probably Will		Definitely Will		I Prefer Not to Answer	
	n	%	n	%	n	%	n	%	n	%	n	%
The first year after you graduate	1	5.6	1	5.6	5	27.8	5	27.8	6	33.3	0	0
Five years after you graduate	1	5.6	0	0	3	16.7	7	38.9	7	38.9	0	0
Ten years after you graduate	2	11.1	0	0	2	11.1	5	27.8	9	50.0	0	0

Looking at the results, 61.1 % of respondents probably or definitely will work in a job that involves engineering one year after they graduate, and that number rises to 77.8% who probably or definitely will work in a job that involves engineering five and ten years after they graduate.

The fifth question in the EMS related to gains on career measures is, how likely is it that you will enter graduate school in the first five years after you graduate? Respondents could choose one of the following items on the scale: definitely will not, probably will not, might or might not, probably will, definitely will, or I prefer not to answer. The table below presents results.

Table 20 (EMS): How likely is it that you will enter graduate school in the first five years after you graduate?

	n	%
Definitely will not	2	10.5
Probably will not	0	0
Might or might not	3	15.8
Probably will	9	50.0
Definitely will	4	22.2
I prefer not to answer	0	0

Results here reveal that 72.2% (n=13) of the respondents probably or definitely will enter graduate school in the first five years after they graduate.

Finally, we asked EMS survey respondents a sixth set of two questions related to career preparation and success. These two items borrowed from the Professional Engineering Pathways Study (PEPS) survey are as follows: Generally speaking, how PREPARED do you think you are to pursue your preferred first position after graduating with your bachelor's degree(s)? Generally speaking, how SUCCESSFUL do you think you will be in obtaining your preferred first position after graduating with your bachelor's degree(s)? Response sets varied by item, and the tables below present results.

Table 21 (EMS): Generally speaking, how PREPARED do you think you are to pursue your preferred first position after graduating with your bachelor's degree(s)?

	n	%
Extremely unprepared	0	0
Moderately unprepared	0	0
Slightly unprepared	1	5.6
Neither prepared nor unprepared	1	5.6
Slightly prepared	5	27.8
Moderately prepared	9	50.0
Extremely prepared	1	5.6
I prefer not to answer	1	5.6

Table 22 (EMS): Generally speaking, how SUCCESSFUL do you think you will be in obtaining your preferred first position after graduating with your bachelor's degree(s)?

	n	%
Extremely unsuccessful	0	0
Slightly unsuccessful	0	0
Moderately unsuccessful	1	5.6
Neither successful nor unsuccessful	0	0
Slightly successful	4	22.2
Moderately successful	9	50.0
Extremely successful	2	10.5
I prefer not to answer	2	10.5

As you can see from these two tables, results demonstrate that half of respondents (50%) reported that they would be moderately prepared to pursue their preferred first position after graduating with their bachelor's degree, with just over a quarter of respondents (27.8%) reporting that they would be only slightly prepared to pursue their preferred first position after graduating with their bachelor's degree. When asked how successful they thought they would be in obtaining their preferred first position after graduating with their bachelor's degree, half of respondents (50%) reported that they would be moderately successful and 10.5% (n=2) of respondents reported that they would be extremely successful.

In the current performance period, a total of 37 students served as research assistants with CSUN faculty mentors in the Summer 2017 research program. For these research assistants, URSSA was distributed at the end of the summer term, and 14 summer research participants elected to participate. A question that we used to measure gains on career-related measures associated with research participation asks participants to rate how much they agree with the following statements: doing research confirmed my interest in my field of study; my resume has been enhanced by my research experience; my research experience has prepared me for graduate school; and my research experience has prepared me for a job. Participants could select one of the following responses: strongly disagree, disagree, agree, or strongly agree. The table below presents results.

Table 23 (URSSA): Rate how much you agree with the following statements

	Strongly Disagree		Disagree		Agree		Strongly Agree	
	n	%	n	%	n	%	n	%
Doing research confirmed my interest in my field of study	1	7.1	0	0	4	28.6	9	64.3
My resume has been enhanced by my research experience	0	0	0	0	3	21.4	11	78.6
My research experience has prepared me for graduate school	0	0	4	28.6	4	28.6	6	42.9
My research experience has prepared me for a job	0	0	1	7.1	8	57.1	5	35.7

Results of descriptive survey data analysis show that, overall, an overwhelming majority of respondents agreed or strongly agreed that their resume has been enhanced by their research experience (100%), doing research confirmed their interest in their field of study (92.9%), their research experience has prepared them for a job (92.9%), and their research experience has prepared them for graduate school (71.4%).

Description of Project Activities Related to the Objective

Specific project activities at CSUN, College of the Canyons, Glendale Community College, Moorpark College, and Los Angeles Pierce College, respectively, are detailed below.

Project Activities at CSUN

Current and planned project activities related to this objective include a resume workshop where students have the opportunity to receive one-on-one feedback on their resume by professionals. In addition to this resume workshop, students will be encouraged to attend TechFest, an arena-style job fair hosted by CSUN's Career Center, and three unique CSUN Career Expos - the Spring Internship and Career Expo, the Non-profit and Government Career Expo, and the Education Expo. Also, CSUN has established monthly meetings for all student participants as an opportunity to present students with helpful information and resources. The first monthly meeting took place on October 13, 2017, with a panel discussion titled "Perspectives from Industry Leaders."

Project Activities at College of the Canyons

Current and planned project activities include monthly student meetings where students are given the opportunity to learn more about internship opportunities, etc. There has also been a celebration of STEM week where each day workshops are offered in areas such as helping students understand the application process for internship opportunities, and the transfer process. These workshops were presented by COC alumni. Additionally, students have been invited to attend special lectures expanding their views of the career options available with a STEM degree. These lectures expose students to how our global economy will affect our future in the STEM field, and how various STEM majors fit into civic engagement through discussion with peers and faculty. And finally, College of the Canyons has sponsored students to attend the Society of Hispanic Professional Engineers (SHPE) Regional Conference. This conference aims to foster an environment to accelerate and enhance leadership, management, and technical skills while providing opportunities to network with professionals and industry representatives.

Project Activities at Glendale Community College

Planned project activities related to this objective include a workshop that provides students with an introduction to the career center. This introduction included subjects such as how to prepare a resume and what to expect at a professional conference. In addition, students were given the task of working with other campus student organizations to organize an annual Maker Faire Conference. This annual conference showcases original projects from students and industry professionals from Los

Angeles County. And finally, Glendale Community College has sponsored students to attend the Society of Hispanic Professional Engineers (SHPE) Regional Conference. This conference aims to foster an environment to accelerate and enhance leadership, management, and technical skills while providing opportunities to network with professionals and industry representatives.

Project Activities at Moorpark College

Project activities at Moorpark College include guest speakers from industry and academia to help students understand different engineering disciplines and occupations within the field and how their education can help them realize their dreams. These guest speakers can also serve as role models for some students and help them make some professional connections. Additionally, field trips have been arranged so that students can see first-hand what some engineers do on the job and be inspired. And finally, students used their resume writing and cover letter writing skills to apply for at least one engineering internship opportunity. While they were not required to secure an internship, this exercise was an important way for students to gain some real-world experience and learn some soft-skills to help them find a job once they graduate.

Project Activities at Los Angeles Pierce College

During this performance period, Los Angeles Pierce College has completed the process for hiring a Career Guidance Counselor Assistant (CGCA). The CGCA has created workshops for students on various topics, including resume building. The CGCA has also worked to facilitate student support activities such as coordinating guest speakers and a field trip to CSUN research laboratories.

<u>Plans to Use of Performance Data to Monitor Progress</u>

Given that the performance measure relates to gains on measures of self-perceptions, attitudes, and skills related to career, plans to monitor performance on these measures include use of results from the EMS and URSSA online survey questionnaires and group interviews. We will use results from EMS, URSSA, and group interviews to monitor progress on meeting this objective. Our plans to use data collected through these procedures include discussions of the results in project meetings to address areas of improvement.

SECTION A - Performance Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

5. Project Objective **[ ]** Check if this is a status update for the previous budget period.

Develop research skills of Hispanic and low-income students in engineering and computer science.

5.a. Performance Measure	Measure Type	Quantitative Data					
		Target			Actual Performance Data		
		Raw Number	Ratio	%	Raw Number	Ratio	%
Gains on measures of self-perceptions, attitudes, and skills related to research from URSSA survey and interviews.	Program or Project		/			/	

Explanation of Progress (Include Qualitative Data and Data Collection Information)

Evaluation Data Sources and Methods for the Objective

Investigating gains on measures related to career preparation, we used results from the Engineering Majors Survey (EMS) and the Undergraduate Research Student Self-Assessment (URSSA)—both online survey questionnaires—and group interviews (i.e., focus groups). Specifically, in late Spring/Summer 2017 (EMS and URSSA) and Fall 2017 (EMS), CSUN collected data on the importance of work involving engineering tasks (EMS), entrepreneurial engineering tasks (EMS), likelihood of working in sector of employment in an engineering field (EMS, likelihood of working in the engineering field (EMS), likelihood of entering graduate school (EMS), and agreement with items about the relationship between research participation and career preparation (URSSA).

The EMS is a project of Stanford University's Epicenter (National Center for Engineering Pathways to Innovation). Working with consultant colleagues from Epicenter, we adapted the EMS to AIMS^2's unique project contexts (e.g., project objectives, performance measures, and activities) [From EMS: Several sections of this survey are based on the Engineering Majors Survey, developed as part of the NSF-funded Epicenter (2011-16) and co-managed by Stanford University and VentureWell. These sections have been adapted with permission from the survey authors; these sections are used under the Creative Common's Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license. You can view the license here: http://creativecommons.org/licenses/by-nc-sa/4.0/).] As part of adapting the EMS survey, we added two career-related items from the Professional Engineering Pathways Study (PEPS) survey [(Brunhaver, S., Matusovich, H., Sheppard, S., & Streveler, R. (2016). *2016 Professional Engineering Pathways Survey.* Available by request.]. With the EMS, we use a pretest/posttest online survey administration with both students who participate in grant-supported services and those students who do not participate. We surveyed project participants in late Spring/Summer 2018 and Fall 2017 (and plan to survey comparison group students) so that we can understand the cohort holistically and use comparative measures to understand program effect. Each cohort and control group will be surveyed twice (at a minimum)—once at the project entry (pretest) and once each year (annually) until project exit (posttest). We used the late Spring/Summer 2017 pretest survey administration as a pilot with the F-1 cohort, resulting in minor updates to the EMS survey instrument. In the Fall 2017 term, we surveyed T-1, F-2, and T-1 cohort students. That is, we sent the EMS to first-project year first-time transfer cohort (T-1), second project-year first-time freshman cohort (F-2) and second project-year first-time transfer cohort (T-2) in Fall 2017, and a comparison group we will be surveyed in Spring 2018. These results will be

reported in next year's APR. For this year's APR, the pretest for the first-time freshman (F-1) cohort and first-time transfer (T-1) cohort in Year 1 at CSUN was completed by 19 students (n=19) in the Spring/Summer 2017 and Fall 2017 semesters. Results of the pretest survey for the first-time freshman cohort (F-1) and first-time transfer cohort (T-1) are reported in the next section "Description of Preliminary Findings Related to the Objective."

URSSA is an online survey instrument for programs to use in assessing the student outcomes of undergraduate research. Developed by the University of Colorado at Boulder, URSSA's currently housed at the Student Assessment of Their Learning Goals (SALG) site (https://salgsite.net). [From the URSSA site: Development and testing of URSSA has been supported by the National Science Foundation through its Divisions of Chemistry and Undergraduate Education, the Biological Sciences Directorate, and the Office of Multidisciplinary Affairs, under grant #CHE-0548488.] Allowing for collection of anonymous responses from students, URSSA focuses on what students learn from their undergraduate research experience, rather than whether they liked it. The self-assessment includes both multiple-choice and open-ended items that focus on students' gains from undergraduate research. For example, students are asked about their gains in thinking and working like a scientist, their personal gains related to research work, their gains in skills, their overall research experience, and any changes in attitudes or behaviors as a researcher. URSSA is a one-shot posttest survey—so near the end of their summer research project, student participants completed an online URSSA self-assessment survey. Once students submitted their survey, data extracts in Excel occurred. Given that student research primarily took place in Summer 2017 and URSSA was distributed once near the end of the summer, we report actual performance data for this measure in the next section titled "Description of Preliminary Findings Related to the Objective."

In addition to the self-assessment survey, students from CSUN, COC, GCC, PC, and MC were invited to participate in focus groups near the end of their summer research work to explore how participation shapes student self-perceptions, attitudes, and skills related to research. Focus groups allow us to collect data on how participation in project activities has improved the research interests/skills of cohort participants. Focus group participants were recruited from a pool of students identified by faculty and staff as research assistants in the Summer 2017 term. A protocol was developed to ask students to reflect on their experiences in the program. The focus groups are led by the program evaluators. These focus groups were audio recorded and hand-written notes were taken during the discussion. Data collection with focus groups will continue in the 2017-18 academic year and we anticipate reporting results from focus group data analysis in the next annual performance report.

Description of Preliminary Findings Related to the Objective

In the current performance period, a total of 37 students were provided the opportunity to interact with CSUN faculty through their participation in the Summer 2017 research program. Participation numbers by project are outlined in the next section titled "Description of Project Activities Related to the Objective." At the end of the summer term, URSSA was distributed and 14 summer research participants elected to participate. There were two questions that focused on the gains on measures of self-perceptions, attitudes, and skills related to research. The first question is: How much did you gain in the following areas as a result of your most recent research experience? And those two areas in question were: confidence in my ability to do research; and understanding what everyday research work is like. Participants were given a choice of responding no gains, a little gain, moderate gain, good gain, great gain, and not applicable. The table below presents results.

Table 24 (URSSA): How much did you GAIN in the following areas as a result of your most recent research experience?

	No Gains		A Little Gain		Moderate Gain		Good Gain		Great Gain		Not Applicable	
	n	%	n	%	n	%	n	%	n	%	n	%
Confidence in my ability to do research	0	0	0	0	4	28.6	4	28.6	6	42.9	0	0
Understanding what everyday research work is like	0	0	0	0	1	7.1	6	42.9	7	50.0	0	0

When considering the results of the 14 respondents, 10 (71.4%) reported good or great gain in confidence in their ability to do research, while 4 (28.6%) reported moderate gain in the same area. And on a similar note, 13 participants (92.9%) reported good or great gain in understanding what everyday research work is like.

The second question asked about the participants overall research experience and about any change in their attitudes or behavior as a researcher. The second question is: During your research experience, HOW MUCH did you: engage in real-world science research; and feel like a scientist. Participants were given a choice of responding none, a little, some, a fair amount, a great deal, and not applicable. The table below presents results.

Table 25 (URSSA): During your research experience, HOW MUCH did you….

	None		A Little		Some		A Fair Amount		A Great Deal		Not Applicable	
	n	%	n	%	n	%	n	%	n	%	n	%
Engage in real-world science research	1	7.1	0	0	1	7.1	6	42.9	6	42.9	0	0
Feel like a scientist	0	0	0	0	2	14.3	5	35.7	7	50.0	0	0

When we consider the results, 12 of the 14 respondents (85.7%) reported that they engaged in real-world science research a fair amount or a great deal. Comparably, 12 respondents (85.7%) reported feeling like a scientist a fair amount or a great deal.

Description of Project Activities Related to the Objective

During the Spring 2017 term, CSUN faculty mentors worked to develop research-related activities for cohort participants. These research-related projects primarily took place during Summer 2017. CSUN faculty mentors facilitated interaction between themselves and community college partner students by inviting College of the Canyons, Glendale Community College, Los Angeles Pierce College, and/or Moorpark College students to join CSUN students in faculty research projects at CSUN with CSUN faculty mentors. In support of this cross-campus initiative, project faculty at CSUN, COC, GCC, PC, and MC have worked collaboratively to support early contact and connections between community college students and CSUN, including a summer application workshop, a formal announcement and program website posting (http://www.ecs.csun.edu/aims2/) of research project topics, interviews and CSUN campus visits, and a safety and orientation training workshop for all summer research participants. Approximately 37 students were selected to participate in a hands-on summer research project with CSUN faculty. The research lasted for a period of 8-10 weeks. The CSUN faculty mentors and summer research project names are listed below:

Professors Behzad Bavarian and Lisa Reiner:
"Application of High Strength Aluminum Alloys for Aircraft Applications," "Corrosion Protection of Steel Pipes/Reinforced Concrete Structures Using Corrosion Inhibitors," and "Application of Low Melting Point Materials for Soldering" with 1 COC student and 2 CSUN students.

Professor Bruno Osorno:
"Electric Speed Drives Technology in Transportation (ESDTT)" with 1 GCC students and 2 CSUN students.

Professor Vidya Nandikolla:
"Eco Four-Wheel Drive," and "Autonomous Drone" with 1 GCC student, 1 Moorpark student, and 2 CSUN students.

Professors Tzong-Ying Hao and Anwar Alroomi:
"The Impact of a Team-Based, Experimental Research Project on Undergraduate Engineering Retention Rate" with 1 COC student, 1 GCC student, and 1 Moorpark student.

Professors Tadeh Zirakian and David Boyajian:
"Augmentation of a Structural Engineering Encounter (SEE) Active-Learning Laboratory Environment: Phase I" with 1 COC student and 3 Pierce students.

Professor Vahab Pournaghshband:
"Detection of Network Traffic Interference by Intermediaries on the Internet" with 2 COC students and 2 CSUN students.

Professor Ruting Jia:
"Solving Real World Problems by Using Intelligent Control Techniques" with 1 COC student and 1 GCC student.

Professor S. Jimmy Gandhi:
"Creation of an Entrepreneurial Mindset Among Undergraduate Students" with 2 COC students, 4 Pierce students, and 1 CSUN student.

Professor John Valdovinos:
"Low-Profile Wireless Power Receivers for Pediatric Circulatory Blood Pumps" with 1 CSUN student.

Professor Bingbing Li:
"Customized Orthodontic Brackets Created by Selective Laser Melting Process for Orthodontic Treatment," and "3D Bioprinting of Aneurysm Blood Vessel" with 1 COC student, 1 GCC student, 1 Moorpark student, and 1 Valley student.

Professor Durgesh:
"Experimental Study of Airfoils in the Wake of a Bluff Body" with 2 Pierce students.

In addition to summer research, several students will be selected to participate in research during the Fall 2017 and Spring 2018 semesters as research assistants. Research assistants have performed and will perform research, attend regular meetings with their faculty mentors, and participate in the annual student research presentations alongside summer research participants.

The CSUN faculty mentors and Fall 2017/Spring 2018 research project names are listed below:

Professor Anwar Alroomi:
"Virtual Labs – Learning Engineering Mechanics and Dynamics with Virtual Hands-on Experiments"

Professors Tadeh Zirakian and David Boyajian:
"Augmentation of a Structural Engineering Encounter (SEE) Active-Learning Laboratory Environment: Phase I"

Professor Vahab Pournaghshband:
"Quality of Service Configuration on Highspeed Routers"

Professor Ruting Jia:
"Solving Real World Problems by Using Intelligent Control Techniques"

Professor Bruno Osorno:
"Electric Speed Drives and Sustainability:

Professor John Valdovinos:
"Experimental Characterization of Low-Profile Wireless Power Receivers for Pediatric Circulatory Blood Pumps"

Professors Behzad Bavarian and Lisa Reiner:
"Application of High Strength Aluminum Alloys for Aircraft Applications," "Corrosion Protection of Steel Pipes/Reinforced Concrete Structures Using Corrosion Inhibitors," and "Application of Electrochemical Techniques for Corrosion Rate Measurements"

Professor Robert Conner:
"Closing the Bulk Metallic Glass Data Gap in the Supercooled Liquid Region"

Professor S. Jimmy Gandhi:
"Creation of an Entrepreneurial Mindset Among Undergraduate Students"

Professor Bingbing Li:
"Additive Manufacturing for Lightweight Metal Matrix Nanocomposite and Functional Tissue Engineering"

Professor Vidya Nandikolla:
"Biomedical Research in Smart Foot Insert"

Plans to Use of Performance Data to Monitor Progress

Data collection for performance measure 5a took place during the first project year. Given that the performance measure relates to gains on measures of self-perceptions, attitudes, and skills related to research, plans to monitor performance on these measures include use of results from the URSSA survey and group interviews. Discussions of results from both data collection procedures will support the monitoring and progress of this objective.

SECTION A - Performance Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

6. Project Objective **[ ]** Check if this is a status update for the previous budget period.

Increase baccalaureate degree completion of Hispanic and low-income students in engineering and computer science fields.

6.a. Performance Measure	Measure Type	Quantitative Data					
		Baseline			Actual Performance Data		
		Raw Number	Ratio	%	Raw Number	Ratio	%
The percentage of Hispanic and low-income students* transferring successfully to a four-year institution from a two-year institution and retained** in a STEM field major***.	Program or Project		331/367	90		311/334	93

***Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient) students**
****Next-term persistence is defined as enrollment in first-term post-transfer (fall or spring) and enrollment in next-term (fall or spring)**
*****Degree seeking and STEM fields at CSUN include all of the majors in the College of Engineering and Computer Science and select majors in the College of Science and Mathematics, which include Mathematics, Physics, and Chemistry**

6.b. Performance Measure	Measure Type	Quantitative Data					
		Baseline			Actual Performance Data		
		Raw Number	Ratio	%	Raw Number	Ratio	%
The percent of Hispanic and low-income* STEM field major** transfer students on track*** to complete a STEM field degree within three years from their transfer date.	Program or Project		112/320	35		119/330	36

***Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient) students**
****STEM fields at CSUN include all of the majors in the College of Engineering and Computer Science and select majors in the College of Science and Mathematics, which include Mathematics, Physics, and Chemistry**
*****On track degree completion at CSUN is defined through units**

6.c. Performance Measure	Measure Type	Quantitative Data					
		Target			Actual Performance Data***		
		Raw Number	Ratio	%	Raw Number	Ratio	%
The percent of Hispanic and low-income students* who participated in grant-supported services or programs and completed a degree or credential**.	Program or Project		/			/	

***Eligible students are Hispanic, Hispanic and low-income (Pell-grant recipient), and low-income (Pell-grant recipient) students**

**Degree completion at CSUN in any term after transfer term
***No data available for this report.

Explanation of Progress (Include Qualitative Data and Data Collection Information)

Evaluation Data Sources and Methods for the Objective

We have worked with CSUN's Office of Institutional Research to produce the 2016-17 transfer rates (6a) and degree completion figures (6b) for Hispanic and low-income students in a STEM field major. The end of the 2016-17 academic year marks the end of the first academic year of the project (but will only mark the end of the first semester after formation of the first CSUN first-time freshman cohort and the first CSUN first-time transfer cohort of student participants during the Spring 2017 term).

We will also work with CSUN's Office of Institutional Research to produce the degree completion figures for performance measure 6c for the Year 2 Annual Progress Report. The 2017-18 academic year (second project year) will be the first to yield data with respect to the two-year degree completion rate for first-time transfer students who have participated in grant-supported services. Subsequently, the 2018-19 academic year (third project year) will be the first to yield data with respect to the three-year degree completion rate for first-time transfer students who participated in grant-supported services, while the 2019-20 academic year (fourth project year) will provide four-year degree completion rates for first-time freshman (and subsequent first-time transfer students) who have participated in grant-supported services.

Description of Preliminary Findings Related to the Objective

The 2015-16 baseline data for the percentage of Hispanic and low-income students transferring successfully to a four-year institution from a two-year institution and retained in a STEM field major (performance measure 6a) is 90% (331/367). That is, of the 367 Hispanic and low-income students who successfully transferred to CSUN and enrolled in STEM in Fall 2015, 90% (n=331) were retained in a STEM field major in Spring 2016. When we interpret actual performance data against the baseline of 90%, we find that in the first performance period (Fall 2016 to Spring 2017), 93% (311/334) of students transferred successfully and were retained in a STEM field major. While the total number of transfer students retained in STEM in the current performance period (n=311) is lower than the baseline (n=331), the overall percentage is higher (90% baseline vs. 93% Year 1).

The baseline data for the percent of Hispanic and low-income STEM field major transfer students on track to complete a STEM field degree within three years from their transfer date (performance measure 6b) was collected for Fall 2013 first-time transfer students who enrolled in STEM and maintained continuous enrollment and completed 24 units per year over three years. From these criteria, the baseline data is 35% (112/320). That is, of the 320 Hispanic and low-income transfer students who started in Fall 2013, 35% (n=112) are on track to or have completed a STEM degree within three years from their transfer date. When we interpret actual performance data against the baseline of 35%, we find that of the transfer students who started in Fall 2014, 36% (119/330) are on track to complete a STEM field degree within three years from their transfer date.

Baseline and actual performance data for performance measure 6c will be reported in the next performance report (Year 2).

Description of Project Activities Related to the Objective

Project faculty and staff have worked to create project activities that support the achievement of this objective through work with cohort participants at CSUN, College of the Canyons, Glendale Community College, Los Angeles Pierce College, and Moorpark College. Project activities that have occurred and/or are currently under way include one-on-one advising, tutoring, mentoring, textbook award program, study skills/orientation-summer bridge in engineering (CSUN), calculus lab (CSUN), first-time freshman math workshop (CSUN), academic excellence workshops (College of the Canyons), attendance of College Day at UC Riverside (College of the Canyons), Education Plan Development Workshop (Glendale Community College), sponsorship of students to attend the Society of Hispanic Professional Engineering (SHPE) Regional Conference (College of the Canyons and Glendale Community College), and team building activities (Moorpark College) (please see "Description of Project Activities Related to the Objective" for objective 2 for more details). In addition, project faculty at CSUN, College of the Canyons, Glendale Community College, Los Angeles Pierce College, and Moorpark College are working collaboratively to support early contact and connections between community college students and CSUN, including Summer Research Opportunities, CSUN faculty speaking events at College of the Canyons, Los Angeles Pierce College student tours of CSUN engineering laboratories, and community college cohort attendance at CSUN's Project Design Showcase and CSUN's TechFest career event. Also, CSUN has established monthly

meetings for all CSUN student participants as an opportunity to present students with helpful information and resources. The first monthly meeting took place on October 13, 2017, with a panel discussion titled "Perspectives from Industry Leaders." Future meetings will be open to all community college participants as well.

Plans to Use of Performance Data to Monitor Progress

The CSUN Office of Institutional Research produced actual transfer rates (6a) and degree completion (6b) figures for the 2016-17 academic year and we have calculated the actual performance data for performance measures 6a and 6b. Our plan to use data collected through this procedure includes discussions of the results in project meetings to address areas of improvement.

SECTION B - Budget Information (See Instructions. Use as many pages as necessary.)

SECTION C - Additional Information (See Instructions. Use as many pages as necessary.)