

Table 1. Project goals and objectives

Project goals	Project objectives
<i>Project goal 1</i>	
Increase the number of Hispanic and low-income students who successfully transfer to CSUN in STEM-related majors through the development of a seamless transfer program	Increase the FTT of COC/GCC Hispanic and low-income students to CSUN in STEM fields
	Increase the number of courses that articulate from COC/GCC to CSUN
	Enhance the academic advising/counseling capacity of COC/GCC in STEM fields
	Enhance the academic participation/transfer readiness rate of COC/GCC STEM students
	Increase and enhance student-faculty interaction at COC/GCC with CSUN faculty in STEM fields
	Enhance the peer environment of COC/GCC students in STEM fields
<i>Project goal 2</i>	
Increase the number of Hispanic and low-income students who graduate from CSUN in STEM-related majors	Increase the program completion of Hispanic and low-income students in STEM fields
	Enhance the academic advising/counseling capacity in STEM fields at CSUN
	Enhance the academic participation rate of CSUN students in STEM classes
	Enhance the research participation rate of CSUN students in STEM fields
	Increase and enhance student-faculty interaction in STEM fields at CSUN
	Enhance the peer environment of CSUN students in STEM fields

Table 2. Project objectives and outcomes by project goals

Project objectives	Project outcomes
Project goal 1	
Increase the FTT of COC/GCC Hispanic and low-income students to CSUN in STEM fields	After two years, increase by 15 the number of COC/GCC Hispanic and low income students who transfer to CSUN in STEM fields
Increase the number of courses that articulate from COC/GCC to CSUN	Increase by 15 the number of courses that articulate between COC/GCC and CSUN in STEM fields
Enhance the academic advising/counseling capacity of COC/GCC in STEM fields	Increase by two the number of COC/GCC counselors who participate in STEM professional development workshops
	Increase by four the number of advising sessions with COC/GCC students in STEM fields
Enhance the academic participation/transfer readiness rate of COC/GCC STEM students	Increase by 75% the COC/GCC students who participate in STEM tutoring sessions and STEM academic workshops and who enroll in online CSUN courses
Increase and enhance student-faculty interaction at COC/GCC with CSUN faculty in STEM fields	Increase by 90% the frequency of COC/GCC student-faculty interactions in STEM fields
	Improve the quality of interaction between COC/GCC students and CSUN faculty in STEM fields
Enhance the peer environment of COC/GCC students in STEM fields	Increase by 15 the number of COC/GCC students who participate in peer-peer tutoring sessions and who are peer mentored by CSUN students
	Improve the quality of peer-peer interaction among COC/GCC students in STEM fields
Project goal 2	
Increase the program completion of Hispanic and low-income students in STEM fields	After two years, increase from 26 % to 30 % the number of Hispanic and low-income students who complete baccalaureate degrees in STEM fields
Enhance the academic advising/counseling capacity in STEM fields at CSUN	Increase by one the number of academic advisors at CSUN in STEM fields
	Increase by two the number of advising sessions with CSUN students in STEM fields
Enhance the academic participation rate of CSUN students in STEM classes	Increase by 75% the CSUN students who participate in tutoring sessions in STEM classes, STEM academic workshops, and supplemental labs sessions
Enhance the research participation rate of CSUN students in STEM fields	Increase by 50% CSUN students in STEM research-related faculty activities
	Improve the research interests/skills of CSUN students in STEM fields
Increase and enhance student-faculty interaction in STEM fields at CSUN	Increase by 90% the frequency of CSUN student-faculty interaction in STEM fields
	Improve the quality of interactions between CSUN STEM students and faculty
Enhance the peer environment of CSUN students in STEM fields	Increase by 30 percent the number of CSUN students who participate in a cohort model, peer-peer tutoring sessions, and peer mentoring
	Improve the quality of peer-peer interaction among CSUN students in STEM fields

Table 3. Project activities by institution and focus

College of the Canyons	Glendale Community College	Cal State Northridge
<i>Student-focused</i>		
Tutoring	Tutoring	Academic Success Center
Mentoring	Mentoring	Peer tutoring/mentoring
Academic Excellence Workshop	Attendance at CSUN Project Design Showcase	Faculty mentoring
Textbook Award program	Attendance at CSUN Tech Fest	Facilitated Academic Workshops
Joint Leadership Conference		Joint Leadership Conference
Joint Outreach Efforts		CSUN Senior Design Projects
Engineering Boot Camps		Participation in CSUN Tech Fest
Attendance at CSUN Project Design Showcase		Participation in Senior Project Design Showcase
Attendance at CSUN Tech Fest		Participation undergraduate research
<i>Faculty-focused</i>		
Faculty exchange	Faculty exchange	Faculty exchange
Curriculum development/articulation	Curriculum development/articulation	Online curriculum development/wireless technology integration/articulation agreements
	Summer faculty externships	

Table 4. Project objectives by project goals and evaluation domains

Domain	Project objectives related to goal 1	Project objectives related to goal 2
Transfer and completion	Increase the FIT of COC/GCC Hispanic and low-income students to CSUN in STEM fields	Increase the program completion of Hispanic and low-income students in STEM fields
Articulation	Increase the number of courses that articulate from COC/GCC to CSUN	
Academic advising	Enhance the academic advising/counseling capacity of COC/GCC in STEM fields	Enhance the academic advising/counseling capacity in STEM fields at CSUN
Academic participation	Enhance the academic participation/transfer readiness rate of COC/GCC STEM students	Enhance the academic participation rate of CSUN students in STEM classes
Research participation		Enhance the research participation rate of CSUN students in STEM fields
Student-faculty interaction	Increase and enhance student-faculty interaction at COC/GCC with CSUN faculty in STEM fields	Increase and enhance student-faculty interaction in STEM fields at CSUN
Peer-peer interaction	Enhance the peer environment of COC/GCC students in STEM fields	Enhance the peer environment of CSUN students in STEM fields

Table 5. Project outcomes by project goals and evaluation domains

Domain	Project outcomes related to goal 1	Project outcomes related to goal 2
Transfer and completion	After two years, increase by 15 the number of COC/GCC Hispanic and low income students who transfer to CSUN in STEM fields	After two years, increase from 26 % to 30 % the number of Hispanic and low-income students who complete baccalaureate degrees in STEM fields
Articulation	Increase by 15 the number of courses that articulate between COC/GCC and CSUN in STEM fields	
Academic advising	Increase by two the number of COC/GCC counselors who participate in STEM professional development workshops	Increase by one the number of academic advisors at CSUN in STEM fields
	Increase by four the number of advising sessions with COC/GCC students in STEM fields	Increase by two the number of advising sessions with CSUN students in STEM fields
Academic participation	Increase by 75% the COC/GCC students who participate in STEM tutoring sessions and STEM academic workshops and who enroll in online CSUN courses	Increase by 75% the CSUN students who participate in tutoring sessions in STEM classes, STEM academic workshops, and supplemental labs sessions
Research participation		Increase by 50% CSUN students in STEM research-related faculty activities
		Improve the research interests/skills of CSUN students in STEM fields
Student-faculty interaction	Increase by 90% the frequency of COC/GCC student-faculty interactions in STEM fields	Increase by 90% the frequency of CSUN student-faculty interaction in STEM fields
	Improve the quality of interaction between COC/GCC students and CSUN faculty in STEM fields	Improve the quality of interactions between CSUN STEM students and faculty
Peer-peer interaction	Increase by 15 the number of COC/GCC students who participate in peer-peer tutoring sessions and who are peer mentored by CSUN students	Increase by 30 percent the number of CSUN students who participate in a cohort model, peer-peer tutoring sessions, and peer mentoring
	Improve the quality of peer-peer interaction among COC/GCC students in STEM fields	Improve the quality of peer-peer interaction among CSUN students in STEM fields

Table 6. Project outcomes by institution

Project outcomes
<i>College of Canyons, Glendale Community College, Cal State Northridge</i>
After two years, increase by 15 the number of <i>COC/GCC Hispanic and low income students who transfer to CSUN</i> in STEM fields
Increase by 15 the number of courses that articulate <i>between COC/GCC and CSUN</i> in STEM fields
Increase by 75% the <i>COC/GCC students</i> who participate in STEM tutoring sessions and STEM academic workshops and <i>who enroll in online CSUN courses</i>
Improve the quality of interaction <i>between COC/GCC students and CSUN faculty</i> in STEM fields
Increase by 15 the number of <i>COC/GCC students who participate in peer-peer tutoring sessions and who are peer mentored by CSUN students</i>
<i>College of Canyons and Glendale Community College</i>
Increase by two the number of COC/GCC counselors who participate in STEM professional development workshops
Increase by four the number of advising sessions with COC/GCC students in STEM fields
Increase by 75% the COC/GCC students who participate in STEM tutoring sessions and STEM academic workshops and who enroll in online CSUN courses
Increase by 90% the frequency of COC/GCC student-faculty interactions in STEM fields
Improve the quality of peer-peer interaction among COC/GCC students in STEM fields
<i>Cal State Northridge</i>
After two years, increase from 26 % to 30 % the number of Hispanic and low-income students who complete baccalaureate degrees in STEM fields
Increase by one the number of academic advisors at CSUN in STEM fields
Increase by two the number of advising sessions with CSUN students in STEM fields
Increase by 75% the CSUN students who participate in tutoring sessions in STEM classes, STEM academic workshops, and supplemental labs sessions
Increase by 50% CSUN students in STEM research-related faculty activities
Improve the research interests/skills of CSUN students in STEM fields
Increase by 90% the frequency of CSUN student-faculty interaction in STEM fields
Improve the quality of interactions between CSUN STEM students and faculty
Increase by 30 percent the number of CSUN students who participate in a cohort model, peer-peer tutoring sessions, and peer mentoring
Improve the quality of peer-peer interaction among CSUN students in STEM fields

Table 7. Summative evaluation questions (related to project outcomes) by institution

Summative evaluation questions
<i>College of the Canyons, Glendale Community College, and Cal State Northridge</i>
Did the first-time transfer of <i>Hispanic and low-income students at COC/GCC to CSUN</i> in STEM fields increase?
Did the number of STEM courses that articulate <i>from COC/GCC to CSUN</i> increase?
Did the percentage of <i>COC/GCC students who enroll in online CSUN courses</i> increase?
Did the number of <i>COC/GCC students who participated in peer tutoring sessions and who are peer mentored by CSUN students</i> increase?
Did the quality of interaction <i>between COC/GCC students and CSUN faculty</i> in STEM fields improve?
<i>College of the Canyons, Glendale Community College</i>
Did the number of advising sessions with COC/GCC students in STEM fields increase?
Did the percentage of COC/GCC students who participated in STEM tutoring sessions and STEM academic workshops increase?
Did the number of COC/GCC counselors who participated in STEM professional development workshops increase?
Did the frequency of COC/GCC student-faculty interaction in STEM fields increase?
Did the quality of peer-peer interaction among COC/GCC students in STEM fields increase?
<i>Cal State Northridge</i>
Did the program completion of Hispanic and low-income students at CSUN in STEM fields increase?
Did the number of academic advisors at CSUN in STEM fields increase?
Did the number of advising sessions with CSUN students in STEM fields increase?
Did the percentage of CSUN students who participated in a cohort model, peer-peer mentoring, and peer mentoring increase?
Did the percentage of CSUN students who participated in STEM tutoring session, academic workshops, and supplemental labs increase?
Did the frequency of CSUN student-faculty interaction in STEM fields increase?
Did the quality of peer-peer interaction among CSUN students in STEM fields increase?
Did the quality of interaction between CSUN STEM students and faculty improve?
Did the percentage of CSUN students who participated in STEM research-related faculty activities increase?
Did the research interests/skills of CSUN students in STEM fields improve?

Table 8. Formative and final summative evaluation questions by evaluation domains

Domains	Formative questions	Final summative questions
Transfer and completion	Did project staff develop a project services and activities to support student transfer and program completion? How did project staff organize services and activities? What did project staff do?	Did transfer and completion of Hispanic and low-income STEM students increase?
Articulation		Did the number of STEM courses articulate from COC/GCC to CSUN increase?
Academic advising		Did the number of counselors who participated in STEM professional development and the number of academic advisors and advising sessions with STEM students increase?
Academic participation	How did students experience interaction with STEM faculty and peers? How did project staff structure activities to facilitate academic participant and research participation?	Did the percentage of students who participate in STEM tutoring, academic workshops, online courses, and supplemental lab sessions increase?
Research participation	How did project staff participate?	Did the percentage of students who participated in STEM research activities increase?
Student-faculty interaction	How did students experience interaction with STEM faculty and peers? How did project staff structure activities to facilitate faculty and peer interaction? What did project staff do?	Did the frequency and quality of student-faculty interaction in STEM fields improve?
Peer-peer interaction		Did the frequency and quality of peer tutoring, peer mentoring, and cohorts increase?

Table 9. Document data collection/program database procedures, instruments, and sources

Data collection procedure	Data collection instrument	Data source
Document data/program database	College of the Canyons, Glendale Community College, and Cal State Northridge	
	Submission of articulation agreements/ courses: Collect documents with evidence of articulated courses	COC/GCC/CSUN project faculty/staff
	Submission of project participant roster: Share current COC/GCC project participants with CSUN counterparts, while CSUN project staff will use roster information to extract CSUN enrollment records	
	Peer-tutoring/ mentoring contacts: COC/GCC develop method to collect number of peer tutoring/mentoring sessions of COC/GCC students by CSUN students, while CSUN uses logs with CSUN peer tutors/mentors to collect data	
	College of the Canyons and Glendale Community College	
	Workshop sign-in/ attendance sheets or workshop registration or participant self-reports: Collect information on the number of professional development workshops that STEM counselors attended	COC/GCC project counselors/staff
	Academic advising log or program data or campus data: Collect/record information on number of STEM academic advising sessions	
	Tutoring session attendance sheets or program data or campus data: Collect information on number of tutoring sessions among participants	
	Workshop sign-in/ attendance sheets or workshop registration or program data: Collect information on the number/type of academic workshop sessions that participants attended	
	Cal State Northridge	
	Submission of number of new academic advisors: Collect documents with evidence of new academic advisors	CSUN project staff
	Academic advising log: Collect/record information on number of STEM academic advising sessions	
	Faculty logs	Cal State Northridge
Structured event log: Record contacts with project participants, including dates, times, participants, and activities related to mentoring, advising, research, etc.		CSUN project faculty
Mentor/tutor logs	Structured event log: Record contacts with participants, including dates, times, participants, and activities related to peer tutoring	CSUN peer mentors
	Structured event log: Record contacts with participants, including dates, times, participants, and activities related to peer mentoring	CSUN peer tutors

Table 10. Interview and observational data collection procedures, instruments, sources, and sampling strategies

Data collection procedure	Data collection instrument	Data source	Sampling strategy
<i>College of the Canyons, Glendale Community College, and Cal State Northridge</i>			
Structured interviews (personal or group)	<i>Interview/focus group protocol (participants):</i> Interview questions related project activities (including quality) of student-faculty interaction (e.g., COC/GCC student interaction with CSUN faculty), peer-peer interaction, research/academic participation, gender/ethnic experiences	COC/GCC project/non-project participants	Sampling strategy TBD with COC/GCC project participants to participate in structured, in-depth interviews or focus groups
		CSUN project/non-project participants	Purposefully sample (TBD) CSUN project participants to participate in structured, in-depth interviews or focus groups
	<i>Interview protocol (faculty):</i> Interview questions related project activities of student-faculty interaction (e.g., CSUN faculty interaction with COC/GCC and CSUN students), faculty mentoring, research, etc.	COC/GCC project faculty	Sampling strategy TBD with COC/GCC project faculty to participate in structured, in-depth interviews
		CSUN project faculty	Purposefully sample (TBD) CSUN project faculty to participate in structured, in-depth interviews
	<i>Focus group protocol (advisory board members):</i> Interview questions related research interest/skills	CSUN project advisory board members	Purposefully sample (TBD) CSUN project advisory board members to participate in a structured focus group
<i>Cal State Northridge</i>			
Structured journaling	<i>Structured journal guide:</i> Prompts related to project activities of student-faculty interaction, peer-peer interaction, research/academic participation, tutoring and mentoring, etc with specific prompts related to number of contacts in each activity category	CSUN project/non-project participants	Sample all CSUN project participants (census) to maintain and submit (monthly) a structured journal through a secure, password-protected Moodle project site
Ethnographic interviews	<i>Ethnographic interview guide:</i> General interview guide with questions related to what will be uncovered in observations	CSUN project participants and faculty	Purposefully sample (mixed) CSUN project participants and faculty for informal conversations/unstructured during fieldwork
Ethnographic fieldwork	<i>Observation guide:</i> Matrix of activities, places, actors by observational process to conduct focused and selected observation sessions	CSUN project activities, events, places, actors	Purposefully sample (mixed) project activities (workshops, lab sessions, research meetings, etc), project places (labs, classroom, etc), and project actors (participants, faculty) to conduct non-participant/participant observations