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SAN BERNARDINO

Coyote First STEP 2015

Report #1

(Final draft)

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EXECUTIVE SUMMARY

The purpose of this study was to provide preliminary results regarding the summer 2015 implementation of **Coyote First STEP (Student Transition Enhancement Program)** at California State University, San Bernardino (CSUSB). The program, which is part of the initiative to increase college readiness and graduation rates at CSUSB, includes an Early Start math class with peer tutor support, an introduction to college-level writing, and a myriad of co-curricular activities and workshops to enhance students' engagement and understanding of college. Coyote First STEP (CFS) is designed to ensure students are on a solid footing for timely graduation by reducing developmental course requirements, enhancing social connections among students, and forging a sense of belonging at CSUSB.

Preliminary findings indicate Coyote First STEP:

1. Reduced developmental course requirements for students;
2. Enhanced students' feelings of connectedness to and engagement on campus;
3. Increased students' awareness of on-campus resources;
4. Increased students' sense of confidence and ability in mathematics.

Coyote First STEP was designed and implemented in about nine months, a much shorter timeline than is typical for new, large-scale programs at universities of CSUSB's size. The planning required a multi-divisional collaboration of more than 150 people, and the delivery of the program involved about 320 people—faculty, professional staff, math tutors, resident assistants and a variety of other student staff members. In addition to needing to master the scale and complexity of the program itself, the campus needed to learn to work together in ways it never had before.

Careful assessment of Coyote First STEP was built into the plan from the beginning. Some of the important data (for example, any effect on GPA, progress to degree, retention, graduation, etc.) will not be available until the end of the first term, first year, and beyond. However, initial findings discussed in detail in this report include:

- 1,517 students lived on campus for three to four weeks (depending on their courses).
- 3,000 parents and guests attended the Coyote First STEP welcome sessions.
- 93.6% of attendees progressed at least one level toward college readiness in mathematics.
- 947 students made themselves fully GE-Math-Ready.
- CFS reduced the number of seats in developmental math courses needed by these students from 2,891 to 859.
    - This is equivalent to a reduction of 2,032 seats, or about 60 course sections, in pre-college-level mathematics courses that students would otherwise have needed to take during the school year.
    - This is equivalent to saving students $2.87 million in tuition—more than the cost of the Coyote First STEP.
    - Not teaching these sections of developmental mathematics during the academic year saves the university at least $240,000 in instructor costs which can be used for college-credit-bearing classes instead.

- 87% of students who paid their enrollment deposit and had an Early Start Math requirement enrolled in fall, as compared to 81.4% of First Time Freshmen who paid their enrollment deposit and had no Early Start Math requirement.
- 98% of participants said they felt the program was beneficial to them; 97% would recommend the program to other incoming freshmen.
- 150 first-session Coyote First STEP students requested to return for the second session and made further progress.
- 199 events produced 35,000 total hours of participation in co-curricular programs that promote student success (including: financial literacy for college success, being a first-generation student, reducing sexual violence, joining clubs and student organizations, study skills, creating a four-year success plan, and cohort-building/friend-making fun activities that increase institutional attachment).
- The effective cost to the university for this 8-week, fully residential summer program was less than $300 per student.
- The Coyote First STEP design won a Model of Excellence Award from University Business Magazine.

The CSU Trustees' goals for the Early Start Program include:

1. Reducing the time it takes students to become college ready in English and mathematics.
2. Reducing time to graduation.
3. Increasing degree completion.
4. Reducing costs for CSU and students.

Based on the data gathered to date, CFS is effective in meeting goals 1 and 4; it is likely to also assist with goals 2 and 3. The 1,517 students who participated in CFS thereby avoided 2,032 seats in developmental mathematics, with 947 becoming fully GE-Math-Ready. This saved students the equivalent of $2.87 million in tuition, and it reduced the university's costs for delivering developmental mathematics during the school year by more than $240,000. Outcomes studied to date provide support for the claim that CFS will reduce time to graduation (in part by making students eligible to enroll in college level courses sooner, in part by increasing their confidence and efficacy). CSUSB data indicates that students who begin college ready for GE mathematics are statistically twice as likely to graduate within four years as those who are not (17% vs. 7%) (CSUSB Office of Institutional Research, 2012).

Given that the outcomes are promising and the costs of the program are comparable to the tuition students would have paid to make equivalent progress in the developmental mathematics sequence during the regular school year, Coyote First STEP should become the model for the entire CSU system.

BACKGROUND

National research clearly shows that academic preparation is only part of the story when it comes to success in college. Lotkowski, Robbins and Noeth (2004), for example, found that only two of the twelve most common categories of reasons for dropping out of college were strictly academic. The rest are mainly psycho-social and socio-economic. The non-academic factors with the strongest impact on retention include:

- The student's level of commitment to obtaining a degree,
- The student's level of self-confidence in his/her success in the academic environment,
- The student's time-management skills, study skills and study habits,
- Institutional factors such as size, selectivity and whether the student received financial aid,
- The student's level of commitment to and satisfaction with the institution ("institutional attachment"),
- The level of social support the student feels the institution provides,
- The student's level of social involvement/engagement with peers, faculty, and staff; participation in campus activities, and
- Students' parents' educational attainment and family income.

Many of the non-academic factors that negatively impact college success are special challenges for specific groups of students. For example, research has shown that students from low-income backgrounds, from racial or ethnic groups that are underrepresented in higher education, and students who are the first in their families to attend college, tend to have significantly lower college success rates. For example, 13% of first-generation students had earned their 4-year degrees compared to 33% of non-first generation students (Nunez & Cuccaro-Alamin, 1998; Tym, McMillion, Barone & Webster, 2004).

Tinto (1975, 1987) argued for the concept of integration, which places importance on the interaction between the student and the institution in promoting retention. He stated that this interaction is critical during the first year of college, which marks a period of transition for the high school student as she becomes a college student. Other researchers, such as Astin (1984) and Pascarella (1980, 1985), emphasized involvement and the institution's role in connecting with students as being important to student success. Since then, institutions have learned more about reaching out to students of different needs and backgrounds and about adapting services to environmental changes that affect students such as culture and economy. Research has shown that fostering a sense of connectedness and belonging to the institution promotes students success. Living on campus with the right kinds of intentional support and programming, and participating in campus activities outside the classroom (attending events, joining clubs, etc.) are examples of things many universities encourage students to do in order to promote connection, belonging and institutional attachment.

Coyote First STEP was designed with the above principles in mind, as applied to our particular context and student populations.

CSUSB and its Context

CSUSB has an enrollment of over 20,000 students. More than 85% of CSUSB students come from San

Bernardino and Riverside Counties, where the Bachelor's degree attainment rate is a mere 19% (compared to 30% in Los Angeles County and California as a whole, and 34% nationally). Eighty-eight percent of students seek an undergraduate degree, 84% attend on a full-time basis, 80% are first generation college students (parents without a bachelor's degree); 57% are Hispanic, 15% are White, 7% are non-resident foreign students, 6% are African American, and 6% are Asian. Sixty-two percent of our undergraduates are low-income students (Pell Grant recipients). CSUSB's latest first-to-second year retention rate of first-time-full-time freshmen (FTF) is 87%, the four-year graduation rate is 10% and the six-year graduation rate is 51% (CSUSB Office of Institutional Research Dashboard, 2015). Sixty-nine percent of incoming freshmen test below college-ready in math and/or English admission: 38% test below college-ready in both mathematics and English, 17% test below college-ready in math only, and 14% in English only (CSUSB Office of Institutional Research, 2015). These levels of developmental course need are significantly higher than the averages for the CSU system.

With the second highest poverty rates in the country, San Bernardino County is challenged by the economic and social conditions in the region which impact educational attainment rates and the quality of life for children and families. For example, over 8% of K-12 students in San Bernardino County are homeless (Emerson, 2014). Additionally, 28.3% of San Bernardino County children live in poverty (San Bernardino County, 2014). The City of San Bernardino itself is in bankruptcy. Unsurprisingly under these conditions, K-12 success rates are lower than the state average. Of the 65 San Bernardino public schools ranked on GreatSchools.org, only seven score higher than 5/10; only two score 8/10 or higher. There is some hopeful progress, though: Between 2010 and 2014, the high school graduation rate in San Bernardino City increased from 62.2% to 79.9% and is now comparable to the California-wide high school graduation rate of 80.8%.

CSUSB has signed Memoranda of Understanding (MOU) with 20 feeder high school districts, guaranteeing admission to CSUSB for students from those districts who satisfy the college preparatory curriculum. Creating these MOUs is one example of how CSUSB is partnering with other stakeholders across the Inland Empire to improve educational outcomes and access for the region. CSUSB is the lead partner in a two-county $5 million Governor's Innovation Award project to create a "cradle to career" pipeline.

In spring 2015, the CSU Trustees introduced six initiatives for student success and completion. Coyote First STEP contributes to several of them, including increasing student preparation/college readiness and promoting high-impact practices. CFS also relates to the initiatives related to bottleneck courses, improved academic advising and data-driven decision-making. CFS similarly provides support to the CSU's Graduation Initiative goals, including increased retention and graduation rates and decreasing achievement gaps.

In summer 2015, CSUSB published its new strategic plan. Coyote First STEP strongly supports Goal #1, Student Success, through promoting retention, timely graduation and other positive student outcomes.

CSUSB's Incoming First-Year Class

In fall 2015, CSUSB welcomed 3,005 First Time Freshmen (FTF); of these, 2,837 are California residents subject to the rules of Early Start.

CFS vs Non-CFS Demographics

Gender	Non-CFS		CFS		Total	
	Count	%	Count	%	Count	%
Female	591	49.3%	1,020	69.0%	1,611	60.2%
Male	607	50.7%	458	31.0%	1,065	39.8%
Total	1,198	100.0%	1,478	100.0%	2,676	100.0%

Ethnicity	Non-CFS		CFS		Total	
	Count	%	Count	%	Count	%
Hispanic or Latino	840	70.1%	1,146	77.5%	1,986	74.2%
White	148	12.4%	78	5.3%	226	8.4%
Asian	96	8.0%	70	4.7%	166	6.2%
Non-Resident	1	0.1%	48	3.2%	49	1.8%
Two or More Races	46	3.8%	27	1.8%	73	2.7%
Black or African American	32	2.7%	83	5.6%	115	4.3%
Unknown	29	2.4%	21	1.4%	50	1.9%
American Indian or Alaskan Native	4	0.3%	2	0.1%	6	0.2%
Native Hawaiian or Other Pacific Islander	2	0.2%	3	0.2%	5	0.2%
Total	1,198	100.0%	1,478	100.0%	2,676	100.0%

Pell Status	Non-CFS		CFS		Total	
	Count	%	Count	%	Count	%
Recipient	763	63.7%	1,073	72.6%	1,836	68.6%
Non-Recipient	435	36.3%	405	27.4%	840	31.4%
Total	1,198	100.0%	1,478	100.0%	2,676	100.0%

Non-/Local	Non-CFS		CFS		Total	
	Count	%	Count	%	Count	%
Non-Local	219	18.3%	301	20.4%	520	19.4%
Local	979	81.7%	1,177	79.6%	2,156	80.6%
Total	1,198	100.0%	1,478	100.0%	2,676	100.0%

First Generation College Student (Parents No College)	Non-CFS		CFS		Total	
	Count	%	Count	%	Count	%
Yes	593	49.5%	871	58.9%	1,464	54.7%
No	605	50.5%	607	41.1%	1,212	45.3%
Total	1,198	100.0%	1,478	100.0%	2,676	100.0%

First Generation College Student (Parents No Bachelor's)	Non-CFS		CFS		Total	
	Count	%	Count	%	Count	%
Yes	916	76.5%	1,236	83.6%	2,152	80.4%
No	282	23.5%	242	16.4%	524	19.6%
Total	1,198	100.0%	1,478	100.0%	2,676	100.0%

Note: These tables exclude Palm Desert Campus participants, summer bridge (EOP), exempted non-participants (local campus, international, etc.), and non-exempt non-participants. Also excluded are 39 CFS participants who did not matriculate for fall 2015.

About 74% of CSUSB's first-time freshmen (FTF) are Hispanic; 68.6% are from low-income backgrounds. About 55% of FTF have parents with no college experience and 80% have parents without a bachelor's.

CSUSB admitted 8,927 of 13,810 FTF applicants (65%), of which 3,500 paid a confirmation deposit. Of the students who paid a deposit, 1,354 (39%) were exempt from the Early Start Mathematics (ESM) requirement (i.e., were college-ready for mathematics); 277 (8%) were exempt for other reasons (i.e., non-residents, international students); 371 (11%) were non-exempt from ESM but did not enroll in ESM; 147 (4%) were conditionally exempt and participated in ESM; and 1,351 (39%) were non-exempt (i.e., tested below the college readiness threshold and were required to take Early Start Mathematics).

In summer 2015, 1,517 admitted students registered for Coyote First STEP (49% of admitted/matriculated class, 89% of admitted students with an ESM requirement). Of these, 47 students ultimately proved to have registered despite having satisfied their conditional exemptions. This was partly the result of the fact that final transcripts were not due to CSUSB until July 1 (some high schools even missed this deadline) and processing took some time. Though these students did not need to participate in Coyote First STEP, participating in the program quite likely had the same positive academic and non-academic benefits for them as it did for the required participants. Also, 39 students who participated in the summer program did not matriculate in fall 2015.

In addition to concerns about academic preparation, CSUSB students may experience social and economic factors that may negatively impact their ability to graduate in a timely manner. This is borne out by the fact that although 69% of FTF have an Early Start English (ESE) or Early Start Mathematics requirement (38% have both), CSUSB has an 87% first-to-second-year retention rate; however, only 28% of students who continue into the second year earn enough units to be promoted to Sophomore status, and the second-to-third-year persistence rate drops to 77%. The 4-year graduation rate is 17% for FTF who do not need developmental math; this drops to just 7% for the FTF who begin their first fall with a developmental math requirement (CSUSB Office of Institutional Research, 2012).

Helping CSUSB's first time freshmen adapt to these academic, social and economic barriers to college success was the core motivation behind developing Coyote First STEP.

PROGRAM DESIGN AND IMPLEMENTATION

In 1996, the CSU system enacted Executive Order 665 which required all first time freshmen to complete any required developmental coursework before the end of their first year. In 2010, the CSU enacted

Executive Order 1048 which mandates that (beginning in summer 2012) incoming freshmen who have not demonstrated proficiency in English and mathematics through the English Placement Test (EPT) or Entry Level Mathematics (ELM) exam participate in the Early Start Program in order to matriculate in the fall. (There are some categories of students who are exempted from the requirement.) The goal of the Early Start Program is to "better prepare students in math and English before their first semester, thereby improving their chances of completing a college degree" (Early Start Program, 2011). The CSU Early Start mandate requires only 1 semester-unit (1.5 quarter-unit) classes in math and English. A fee waiver from the CSU system covers all costs of the math options for students with estimated family contributions (EFC) below $5,000. Each CSU campus has authority to design Early Start programs to best meet their students' needs.

The minimalism of this requirement is one of the current limitations of the CSU Early Start Initiative. Many English faculty throughout the CSU system objected to the program, arguing that all students are "developing writers," that no one is "remedial" in this area, and that skills like writing can be developed only through extended practice with feedback and cannot be meaningfully remediated in a 1- or 1.5-unit class taught over a few days in summer. For students who are close to the cut score in math, a short "refresher" course might be sufficient to boost them to success in GE math, but for others with greater deficiencies, a 1- or 1.5-unit class, again, cannot be expected to remediate student math knowledge that should have been developed over years in the K-12 system.

For these and related reasons, many CSU campuses have found ways to work around the Early Start system in order to provide more meaningful summer programs for students. For example:

- Cal Poly Pomona offers 1-unit and 3-unit courses in face-to-face summer classes, and 1-unit online classes. The program is non-residential, and students pay the CSU Early Start registration fees ($182/unit, which can be waived if the student's Estimated Financial Contribution for financial aid is below a certain level).
- San Diego State University offers the FAST (Freshman Academic Success Track) summer program, during which incoming students take two 3-semester-unit classes (ESE and ESM, or one of those plus a general education course) over five weeks. SDSU's FAST is non-residential and required for local students (non-local students are required to complete a similar program online); students pay tuition and fees for the courses.
- CSU Dominguez Hills offers a limited number of seats in a free, six-week, non-residential Summer Bridge program that offers students the opportunity to take three or six units and make progress toward college readiness in English and/or math. Preference is given to students who test as needing two developmental courses in both English and math in order to reach college readiness.

Students such as those CSUSB serves—with high developmental course needs plus significant social, economic and other challenges—need much more than Early Start, as mandated, can provide. CSUSB was willing to invest significant university resources and advocate with the CSU Chancellor's Office, local high school districts and private funders to support a radically expanded residential summer support

program that is free to students. Making this kind of commitment is necessary if higher education really wants to increase student success in a meaningful way.

The Design Process

Co-chaired by the Dean of Undergraduate Studies and the Dean of Students, a core group of CSUSB faculty and staff began meeting regularly in November 2014 to plan the summer 2015 intervention. The Vice Presidents' Council was instrumental in reviewing the budget and helping clear barriers to moving quickly to create this program.

CSUSB was committed to a summer program that was fully residential and free to students. Both of these are key components: Since the vast majority of CSUSB students never live on campus, having a summer residential experience is a very meaningful intervention, as it affords students the opportunity to become fully integrated into campus life. Satisfaction surveys and the outcomes related to requiring one night of living on campus during CSUSB's freshman summer orientation program already demonstrate this. The literature on residential experiences supports the local data: students who live on campus tend to have better academic outcomes, increased engagement and institutional attachment, and higher graduation rates (Pascarella, Bohr, Nora, Zusman & Inman, 1992). In addition, making Coyote First STEP free to CSUSB students made participation possible for many more (the majority of whom are from underrepresented groups, come from low-income backgrounds and are the first in their families to attend university) and allowed CSUSB to make the program mandatory for all students with an Early Start Math requirement.

An immediate issue was the difficulty of predicting the number of students who would have an Early Start requirement. The normal vagaries of the admissions pipeline apply (even a profile of the applicant pool, or of the admitted student pool, does not indicate with certainty which students will actually enroll). However, the uncertainty was compounded by the fact that the CSU's methods for assessing college readiness were changing in ways that seemed sure to increase the proportion of CSUSB first time freshmen who would have an ESM requirement or a conditional exemption from ESM—but the amount of change in each category was unknown and there was no prior year to base estimates upon. Students who are conditionally exempt from ESM have the opportunity to make themselves fully exempt by taking a particular course in the final year of high school, but many do not learn of that option until after their senior year of high school has begun and there is no opportunity to add the class, or their high schools don't offer the course. (Since Early Start is only a requirement for some CSU-bound students and only a relatively small proportion of graduates from any given high school ultimately attend the CSU, high schools are not entirely blameworthy on this score.)

Not having a clear picture in advance of the number of students CSUSB would serve made planning some of the details difficult (food and lodging in particular, but also hiring enough instructors and offering the right mix of courses). Additionally, because numerous programs and support services work reduced hours during the summer, planning engaging events and diverse programs to support student identification and engagement proved challenging at times.

The Intensive Mathematics Program

Since 2002, CSUSB's Office of Undergraduate Studies, in partnership with the Mathematics Department, has offered the Intensive Mathematics Program (IMP) as an option for students who need developmental mathematics courses in the summer before their first enrollment. IMP was continued after the system-wide introduction of the Early Start program in 2012 as a way for students to meet the Early Start requirement while delivering more meaningful instruction that would actually advance students toward college-readiness in mathematics and hence avoid the need for developmental mathematics courses during the first year of college.

IMP was taught in the summer as a five-week (non-residential) program with an extended lecture (9:00 a.m. to noon) each day on a specific math concept. After an hour break for lunch, the students met in smaller groups with intensive support from tutors. Afternoons (from 1:00 to 4:00 p.m.) were spent working on problems that had been carefully designed to reinforce the specific concept taught in the morning. This pattern was repeated for a total of ten days.

Unlike in regular Early Start, where a student's ELM results dictate one quarter of developmental mathematics (a course called Math 90) or two quarters (i.e., Math 80 and then Math 90), all students who signed up for IMP completed a diagnostic exam on the first day. The diagnostic exam is important because it ensures all students have the fundamental skills necessary to succeed in the second half of the program even if their ELM score would have allowed them to do less developmental work in math during the regular academic year. All IMP students complete <u>both</u> Math 80 and 90—starting at the lower level seems to make a difference to the future success in other math classes, presumably because the foundation is stronger.

At the end of the first half of the instructional program (Math 80 topics), students are given the same final examination they would have taken during the regular term for the analogous math course, with a required passing grade of C or better. The students who receive a C or better are then allowed to continue into the second half of the course (Math 90 topics), which takes the same format, again with the analogous course exam at the end. Students who successfully complete both sections of IMP are deemed fully GE-Math-Ready.

Outcomes in IMP 2013 cohort were impressive:

- A higher percentage of IMP students than regular Early Start students at the same level advanced in the developmental sequence (IMP: 89.9%; Early Start: 72.1%).
- When comparing quarters of developmental mathematics needed after completing the summer math program intervention, IMP reduced the need for developmental math by 98.7%, while Early Start reduced it by only 73.5%.
- IMP students (89.4%) had a higher pass rate in GE math than Early Start students (80.1%).
- In terms of grades in general education mathematics and first-term GPA, IMP students did not differ from their "college ready" peers who were not required to complete developmental coursework.

- IMP students took fewer quarters to complete GE math than GE-Math-Ready students (1.33 vs 1.40).
- IMP students had a higher percentage of courses attempted/completed in their first year (92.8%) than GE-Math-Ready students (90.9%).
- IMP students attempted more GE courses in their first year than GE-Math-Ready students (6.53 vs 6.09).
- IMP students had higher second, third and fourth year retention rates than GE-Math-Ready students.

IMP vs. GE-Math-Ready Retention Rates, 2013 Cohort

Retention Rates	Second Year	Third Year	Fourth Year
IMP	91.1%	82.5%	75.1%
GE-Math-Ready	90.0%	79.3%	72.0%

The success of IMP, and the very high developmental math need in CSUSB's FTF population, inspired CSUSB to make IMP the core of its new summer Coyote First STEP mathematics program for all FTF with an ESM requirement.

Co-Curricular Programming

Student engagement theory has its origin in the work of Astin (1984, 1985), Pace (1984), and Kuh and his colleagues (Kuh, Schuh, Whitt, and Associates, 1991; Kuh, Whitt, and Strange, 1989). Additionally, based on their review of 20 years of research, Terenzini and Pascarella (1991) concluded "one of the most inescapable and unequivocal conclusions we can make is that the impact of college is largely determined by the individual's quality of effort and level of involvement in both academic and nonacademic activities" (p. 610). Thus, student engagement in educationally purposeful activities has desirable effects on student learning and success during college (Astin, 1977, 1993; Feldman & Newcomb, 1969; Kuh, Pace, & Vesper, 1997; Pace, 1990; Pascarella & Terenzini, 1991).

Research has strongly supported this assumption, indicating that engagement is positively related to gains in general abilities and critical thinking (Endo and Harpel, 1982; Gellin, 2003; Kuh, Hu, and Vesper, 2000; Kuh and Vesper, 1997; Pascarella, Duby, Terenzini, and Iverson, 1983; Pascarella, Whitt, Nora, Edison, Hagedorn, & Terenzini, 1996; Pike, 1999, 2000; Pike and Killian, 2001; Pike and Kuh, 2005; Pike, Kuh, and Gonyea, 2003; Terenzini, Pascarella, and Blimling, 1996). Student engagement is also positively linked to grades (Astin, 1977, 1993; Indiana University Center for Postsecondary Research, 2002; Pike, Schroeder, and Berry, 1997) and persistence rates (Astin, 1985; Pike et al., 1997), and students who

socially integrate into the campus community increase their commitment to the institution and are more likely to graduate (Tinto, 1975; Demetriou & Schmitz-Sciborski, 2011).

It is also widely recognized that the quality of the first year experience (FYE) establishes how well students adjust academically, socially and emotionally to the university environment which, in turn, positively affects their academic performance and retention (Tinto, 1987, 1993; Krause, Hartley, James & McInnis, 2005; Kuh, 2005; de Beer, Smith & Jansen 2009).

Based on these premises and the idea that CFS is the beginning of their first year experience, the co-curricular programming for CFS was developed. CFS's co-curricular program elements allow CSUSB to create for students the fundamental structures required for student success. These co-curricular elements work to intentionally develop and support students' college readiness and transition, sense of belonging, institutional affinity and resiliency.

CFS's co-curricular program was designed to promote these student learning outcomes:

1. Develop connections with peers, staff and faculty.
2. Explore how their own identities impact their views and inform their perceptions of others.
3. Identify campus resources for overall health, well-being, academic success and social support.
4. Understand how curricular and co-curricular engagement impacts their experiences at CSUSB.

Guided by these target outcomes, 30 departments from across campus offered 199 events resulting in nearly 35,000 hours of engagement by CFS students. These events and programs allowed students to choose from numerous daily programs to not only engage socially with one another, but also connect them with student support staff, including but not limited to academic advisors, health educators and student club and organization leaders.

Another aspect of the CFS co-curricular program involves living on campus. Several studies have demonstrated that living on campus, as opposed to commuting to college, is positively related to engagement (Chickering, 1975; Pascarella et al., 1992; Pike & Kuh, 2005; Terenzini, Springer, Yaeger, Pascarella & Nora, 1996). The gains associated with on-campus living are further enhanced by participating in learning communities, which substantially increase student engagement, self-reported gains in learning, and persistence (Indiana University Center for Postsecondary Research, 2002; Pike, 1997; Pike, 1999; Zhao and Kuh, 2004). Through its residential nature, the CFS program further supports first-year students' initial experience by providing them additional opportunities to connect with their peers, become engaged on campus and find social support.

DEMOGRAPHIC COMPARISON OF CFS AND NON-CFS STUDENTS

Social justice was at the forefront of the leadership team's considerations when designing CFS. Part of the goal was to increase success rates for students from disadvantaged backgrounds, and ultimately to allow citizens of the Inland Empire to enjoy college credential rates, and the attendant economic benefits, more in line with state-wide and national averages. To track this, a comparison was conducted of the demographics of students who were required to attend and those who were not. The comparison shows that a greater proportion of students from underrepresented backgrounds were required to attend CFS. CFS thus served students from underrepresented backgrounds, and the success

rates in the program helped to "level the field": after CFS, underrepresented students as a group more closely resemble the overall FTF population in terms of math readiness and thus have a higher chance than they otherwise would have had of succeeding in college at rates similar to or exceeding the overall FTF population.

Chi-square tests were used determine whether CFS and non-CFS students were representative of the entire first-time-freshmen class based on demographics. It was found that CFS and non-CFS students were not representative of the FTF class in terms of gender. There were more female CFS students ($\chi^2(1, N = 1{,}478) = 47.91$, $p < .001$) and more male non-CFS students ($\chi^2(1, N = 1{,}198) = 59.05$, $p < .001$) when compared to the entire FTF class.

When examining ethnicity, both samples of CFS ($\chi^2(8, N = 1{,}478) = 48.92$, $p < .001$) and non-CFS students $\chi^2(8, N = 1{,}198) = 54.70$ were not representative of the FTF population as a whole. More specifically, there were more Hispanic and African American CFS participants, and fewer White and Asian CFS participants compared to the entire first-time-freshmen class. Likewise, there were fewer Hispanic and African American non-CFS participants and more White, Asian and multi-race non-CFS students in comparison to the FTF population.

The Pell status of both CFS and non-CFS students differed significantly from that of the FTF class. Compared to the first-time-freshmen population, there were more Pell recipients among CFS participants ($\chi^2(1, N = 1{,}478) = 21.75$, $p < .001$) and fewer Pell recipients among non-CFS students ($\chi^2(1, N = 1{,}198) = 5.53$, $p = .05$).

Both CFS ($\chi^2(1, N = 1{,}479) = 0.33$, $p > .05$) and non-CFS ($\chi^2(1, N = 1{,}198) = 3.21$, $p > .05$) students were representative of the first-time-freshmen population when examining the proportion of local and non-local students.

We examined the proportion of CFS and non-CFS "first generation" students using the following definitions: (1) both parents with no college experience and (2) both parents with no bachelor's degree. Using both definitions of a first generation college student, the proportion of first generation CFS participants was greater than the FTF population ((1): $\chi^2(1, N = 1{,}478) = 7.43$, $p = .01$; (2): $\chi^2(1, N = 1{,}478) = 10.34$, $p = .01$). Similarly, the proportion of first generation non-CFS students was less than the overall FTF class for both definitions of a first generation college student ((1): $\chi^2(1, N = 1{,}198) = 16.93$, $p < .001$; (2): $\chi^2(1, N = 1{,}198) = 11.16$, $p < .001$).

Effect of CFS on Enrollment of Students from Low-Income Backgrounds and Underrepresented Groups

During the planning and implementation phases, the planning team received feedback from a few CSUSB community members who were concerned that CFS would be differentially detrimental to certain students, particularly those who needed to work to support themselves or their families. This sort of outcome would be contrary to the purpose of the program and contrary to the mission of the university; therefore, it is important to assess whether the worry was borne out by what actually occurred.

In advance of receiving these sorts of comments, CFS policies were set so that students who were married, raising children or over the age of 21 would automatically be exempted from the requirement

to live on campus and could request an exemption from the entire program if needed. Since CFS (and Early Start in general) is a requirement for FTF who have just graduated from high school, those numbers were expected to be low; they were.

The CFS team also accepted requests for exemptions from those who needed to be heavily involved in caring for siblings and other relatives (for example, several students were the only available caregivers for younger siblings when both parents were working).

Requests for exemptions based on health issues were automatically granted. Generally, students were asked for a detailed explanation of the circumstances surrounding the exemption request (sometimes including follow-up emails, phone calls or interviews) but they were not required to provide extensive documentation. There were so few requests, as a percentage of attendees, that the potential for abuse of the system was minimal.

In all cases, and especially in the case of requests for exemptions for reasons of employment, the CFS team used the opportunity of the request to have a coaching conversation with students and families about their goals and strategies for overall success. All the benefits of attending were reinforced for students—from academic to social to financial. In the vast majority of cases, students came to agree that working part time and/or for close to minimum wage instead of attending the program would not earn them enough money to outweigh the program benefits. Students received a one-page handout about the financial implications of CFS and not/working for the month that included an analysis of the opportunity costs and the fact that the best way to reduce the cost of college is to graduate sooner (which being GE-Math-Ready greatly helps). When requested, students were provided with a letter explaining the program to employers so that they could negotiate altered work schedules (i.e., working only weekends) or temporary leaves of absence.

Students and families made a few requests that students not be required to live on campus but would attend classes. These were sometimes pitched as “moral” or religious objections or concerns about safety in an “uncontrolled” residential environment. Given that CSUSB is a non-residential campus (with only 1,400 beds for almost 20,000 students), given that the vast majority of CSUSB students’ parents and families have not attended college (let alone a residential college), and given cultural attitudes about daughters, these sorts of objections were not unexpected. These requests/objections were treated as opportunities for coaching conversations with students and families about the benefits of full participation in the program and about the “culture conflicts” inherent in the first-generation student experience.

Students who were not granted exemptions were told that not attending CFS would mean they would be ineligible to enroll for classes in fall. In the end, very few students (0.3%) decided to not attend CSUSB because of the requirement to live on campus for the month.

	Incomplete Exceptions Request, Attended CFS		Approved Full Exemption from CFS		Excused From Living On Campus, Attended CFS		Denied CFS Residential Exemption, Attended CFS		Denied CFS Residential Exemption, Did Not Enroll in Fall		Total Requests	
Asian	0	0%	1	20%	8	13%	1	4%	0	0%	10	10%
Black	0	0%	1	20%	5	8%	3	13%	0	0%	9	10%
Hispanic	2	100%	1	20%	37	62%	15	63%	3	60%	58	60%
Two or More	0	0%	1	20%	0	0%	0	0%	0	0%	1	1%
Unknown	0	0%	1	20%	2	3%	2	8%	0	0%	5	5%
White	0	0%	0	0%	8	13%	3	13%	2	40%	13	14%
Pell Eligible	1	50%	3	60%	43	72%	12	50%	1	20%	59	61%
Male	*0*	*0%*	*2*	*40%*	*16*	*27%*	*9*	*38%*	*3*	*60%*	*27*	*30%*
Female	*2*	*100%*	*3*	*60%*	*44*	*73%*	*15*	*63%*	*2*	*40%*	*64*	*70%*
Total Students	**2**		**5**		**60**		**24**		**5**		**96**	

Of 96 requests for exemptions from CFS, two were incomplete but both of these students ended up attending CFS. Five of the 96 requests were granted full exemption from CFS and were not required to participate in the program at all. Sixty of the 96 requests were granted exemption from the requirement to live on campus (these students attended classes during the day but went home every evening). Twenty-nine students requested but were denied an exemption from the residential requirement; only 5 of these 29 (5.2% of all exemption requesters, 0.3% of the CFS 2015 cohort) decided not to attend CFS, thus voluntarily foregoing the opportunity to enroll at CSUSB in fall. There is no way to know whether or not these students would have enrolled if the CFS requirement had not existed, or whether they would have been part of the "summer melt" that is a normal aspect of the admissions funnel.

The data indicates that there was no racial or economic bias in the exemption process. The demographics of CFS attendees closely mirrored the demographics of the applicants who paid enrollment deposits, deposit-payers with an ESM requirement, and ESM-required students who enrolled as FTF in fall 2015.

There is a gender bias in the exemptions data. Whereas 60% of FTF are female, 70% of requests were from females, and 73% of students excused from the requirement to live on campus were female. This may represent the societal bias that females more often are the ones who care for children and other dependents. It may also reflect attitudes among CSUSB students' families that female students need to be "protected" and hence should live at home.

Effect of CFS on Enrollment Target (Effect on "Summer Melt")

The following analysis seeks to gauge the impact Coyote First STEP may have had on FTF summer melt (i.e., the number of FTF who paid their enrollment deposits but ultimately did not enroll for fall), by comparing Fall 2014 versus Fall 2015 enrollment rates for those requiring developmental math. The concern in advance was that the requirement to live on campus for four weeks in the summer before students were expecting to start college, especially with short notice because of the design and implementation timeline, would significantly increase the number of students who ultimately decided not to attend CSUSB.

For fall 2014, out of the 3,115 FTF who paid their enrollment deposits, 1,547 students required ESM (49.7% of those making enrollment deposits). Of these students, 1,432 (92.6% of students with an ESM requirement) satisfied the ESM requirement (either through completing the program or being exempted), and 1,346 (94% of students satisfying the requirement; 87% of students with an ESM requirement at the time of enrollment deposit) enrolled in fall 2014.

For fall 2015, out of the 3,500 FTF deposits, 1,863 students (53.2%) required ESM. Of these students, 1,684 (90.3%) satisfied ESM, and 1,621 (96.3% of students satisfying the requirement; 87.0% of those who had an ESM requirement) enrolled in fall 2015. This can be compared with the 1,637 who paid deposits and did not have an ESM requirement, of whom 1,333 (81.4%) enrolled in fall.

Year	Enrollment Deposit Paid	ESM requirement?	Satisfied ESM	Enrolled in Fall
2014	3,115	Yes: 1,547 (49.7%)	1,432 (92.7%)	1,346 (87.0%)
		No: 1,568	n/a	1,378 (87.9%)
2015	3,500	Yes: 1,863 (53.7%)	1,684 (90.3%)	1,621 (87.0%)
		No: 1,637	n/a	1,333 (81.4%)

These results suggest that requiring FTF with an ESM requirement to live on campus for a month did not negatively affect FTF students' decision to participate in ESM, or to register for the fall term, as the rates for fall 2015 FTF were similar to those of 2014 FTF. In both of the last two years, 87% of admitted students with an ESM requirement ultimately enrolled in fall, even though there was a higher proportion of ESM-need in the 2015 class (49.7% vs. 53.2%). In 2015, a higher proportion of students

who satisfied ESM enrolled in fall than in the previous year (93% vs. 96.3%). In 2015, a higher proportion of students with an ESM requirement enrolled in fall as compared to those without an ESM requirement (81.4% vs 87.0%).

A total of 51 students were admitted after August 3, 2015 (the start of the second session of CFS) and are currently enrolled for fall 2015. Of the 51, a total of 21 were identified as ESM-required. Three of the 21 had a residency exemption, four had a local campus exemption, 7 completed their ESM requirement and 7 did not did participate/were non-exempt.

The chart below compares the rate of ESM need in the 2014 and 2015 FTF cohorts. Although the pre-summer statuses are slightly worse in 2015, the post-summer statuses are significantly better than in 2014. CFS was more effective than even the expanded IMP program taught in summer 2014.

Distribution of ELM Status, 2014 to 2015				
Status	Fall 2014		Fall 2015	
	Pre-Summer	Post-Summer	Pre-Summer	Post-Summer
GE Ready	48%	72%	45%	78%
One Quarter	14%	13%	16%	8%
Two Quarters	25%	7%	23%	10%
Three Quarters	13%	8%	15%	4%

RESULTS OF COYOTE FIRST STEP

Reduction in Developmental Mathematics Requirements

The analysis of the reduction in developmental mathematics requirements included 1,431 fall 2015 enrolled CFS students. Eighty Palm Desert Campus (PDC) ESM participants and 47 CFS participants who were identified as not requiring ESM (e.g., SAT exempt, EAP exempt) were excluded from the analysis. While the CSU record system only has notations for three developmental courses, students may actually require four quarters of developmental math at CSUSB. For the purposes of this report, ELM scores less than or equal to 18 were counted as needing four quarters of developmental mathematics.

Of these 1,431 CFS participants, 947 (66%) were made general education (GE) Math Ready, 337 (24%) reduced by one level but did not become fully GE-Math-Ready, 56 (4%) reduced by two levels but did not become fully ready, and 91 (6%) did not reduce their developmental requirements (i.e., RP only). (See *Appendix A* for success rate by local school district.)

In addition, 39 CFS participants (2.5%) did not enroll for fall 2015 after completing the program. Of the 39 students, 9 (23%) were made (GE) Math Ready, 17 (44%) reduced by one level, 10 (26%) did not reduce their remediation requirements (i.e., RP only), and 3 (8%) were identified as not requiring remediation.

Pre-CFS Math Remediation Status		**Post-CFS Math Remediation Status**					
		1 Qtr.	**2 Qtrs.**	**3 Qtrs.**	**4 Qtrs.**	**GE Ready**	
1 Qtr.	431	35	0	0	0	396	92%
2 Qtrs.	605	118	25	0	0	462	76%
3 Qtrs.	331	37	179	26	0	89	27%
4 Qtrs.	64	0	19	40	5	0	0%
Total	1,431	190	223	66	5	947	66%

Note: Students could reduce up to three (3) quarters through CFS.

Prior to participation in the summer program, CSUSB would have needed to provide 2,891 seats in developmental mathematics courses (MATH 075A, 075B, 75C, 080, and/or 090) for those students who participated in CFS to become GE-Math-Ready during the academic year (*M*= 2.02 quarters). After CFS, the number of seats in developmental mathematics courses needed to make this cohort GE-Math-Ready decreased to 859 (*M*=0.60), a reduction of 2,032 seats, or 8,128 total units. While the CSU does not charge per-unit tuition, $353 per unit is the effective rate for a full-time student (according to a Department of Defense calculation for CSUSB). **At this rate, Coyote First STEP saved students $2,869,184 in tuition for the developmental math courses avoided.**

The cost to the university to deliver 2,032 seats of developmental mathematics is quite significant. At an average section size of 34 students, 2,032 seats is equivalent to 60 sections. At a rate of $4,000 per section for instruction, this means CFS saved the university at least $240,000. This figure does not account for additional sections that would be needed because the fail-and-repeat rates are quite high in developmental mathematics courses during the regular school year. Estimating that a typical classroom is approximately 24 x 30 feet, counting 20 rooms used all year to cover the 60 sections, and applying the university's effective cost rate for space, energy, etc., of $8/sqft/year, these sections cost the university an additional $115,200 to deliver. Again, this does not include the additional sections needed to account for the fail-and-repeat rate. This means the total cost saved in not teaching these developmental math sections during the academic year is more than $355,000. In addition, many students who are not GE-Math-Ready in their first fall of enrollment do not persist into the second year, drop out before graduating, or take much too long to graduate. There are individual, institutional and societal costs of all of these negative outcomes. Dropping out costs both the student (in lost opportunity, plus the likelihood of having student loans to repay without a degree to earn more income) and the university (in lost tuition and state revenue for the remainder of the years to graduation—and, of course, leads to a decrease in important metrics such as retention and graduation rates).

It is worth mentioning, too, that space is at a premium on campus: enrollment has increased dramatically, reaching an all-time high of 20,000 students in fall 2015. The last time a new classroom building was completed on campus was fall 2009, the headcount was 17,852. Freeing up 60 or more sections that can be scheduled for other classes during the school year will be a significant benefit to continuing students.

Historical Retention and Graduation Rates Based on ELM Scores

		Retention					Graduation			Dropout		
ELM Status	Cohort	2nd Year	3rd Year	4th Year	5th Year	6th Year	Within Four Years	Within Five Years	Within Six Years	Summer Grads	7th Year Retention	Dropout
Exempt	1052	84%	72%	65%	43%	18%	19%	41%	53%	0.6%	7%	40%
Passed	900	79%	67%	59%	38%	18%	14%	36%	46%	0.6%	9%	45%
1 Quarter	751	80%	67%	60%	46%	23%	8%	29%	40%	1.2%	11%	48%
2 Quarters	1189	79%	66%	59%	46%	21%	7%	27%	40%	0.8%	9%	50%
3 Quarters	197	67%	54%	49%	41%	21%	3%	13%	25%	2.0%	9%	64%
Total	4089	80%	67%	60%	44%	20%	11%	32%	44%	0.8%	9%	47%

From CSUSB Office of Institutional Research http://ir.csusb.edu/institutionalResearch/documents/RemediationReport.pdf page 10.

The overall course pass rate for CFS was 93%, with 2,584 passing credits earned out of 2,780 attempts. ESM081 saw the highest pass rate of 97%, and ESM091 the lowest with 89%.

Summer 2015 (CFS) Outcomes

CFS Course	Count	Credit/ Pass (CR)	Did not Pass (RP)	% CR	% RP
ESM075A	68	61	7	90%	10%
ESM075B	375	343	32	91%	9%
ESM081	1,217	1,181	36	97%	3%
ESM091	1,120	999	121	89%	11%
Total	2,780	2,584	196	93%	7%

For comparison, fall 2014 outcomes for incoming first-time freshmen for the equivalent developmental math courses are presented below. Note that pass rates in equivalent courses are significantly better in summer 2015 than in fall 2014 in every case except the lowest-level course.

Fall 2014 Outcomes

Course	Count	Credit/ Pass (CR)	No Credit (NC)	% CR	% NC
MATH075A	18	18	-	100%	-
MATH075B	101	75	26	74%	26%
MATH075C	28	21	7	75%	25%
MATH081	221	179	42	81%	19%
MATH091	310	256	54	83%	17%
Total	678	549	129	81%	19%

For comparison, summer 2014 outcomes for incoming first-time freshmen are presented below. Note that outcomes in summer 2015 were better at every course level, and that about 1,000 additional courses were passed.

Summer 2014 Outcomes

Course	Count	Credit/ Pass (CR)	Satisfied (RP)	No Credit (NC)	% CR	% RP	% NC
MATH075A	29	23	5	1	79%	17%	3%
MATH075B	209	188	14	7	90%	7%	3%
ESM080	227	204	21	2	90%	9%	1%
MATH081	557	487	51	19	88%	9%	3%
ESM090	260	217	36	7	83%	14%	3%
MATH091	484	431	43	7	89%	9%	1%
Total	1,766	1,550	170	43	87%	10%	2%

Anticipated Additional Academic Benefits of CFS

The Intensive Mathematics Program (IMP) that is the core of CFS has a proven record of improving academic outcomes beyond just decreasing the need for developmental mathematics courses in the first year of enrollment.

A study of IMP funded by the Southern Education Foundation showed that a higher percentage of IMP students than Early Start students made progress in the developmental sequence. 98.7% of IMP students reduced their need for developmental coursework. When they then took GE math, IMP students had a higher pass rate than Early Start students, and had GE math grades that did not differ from those of their "college ready" peers who were not required to complete developmental coursework. IMP students were retained at a higher rate and earned more units per quarter than other first time freshmen.

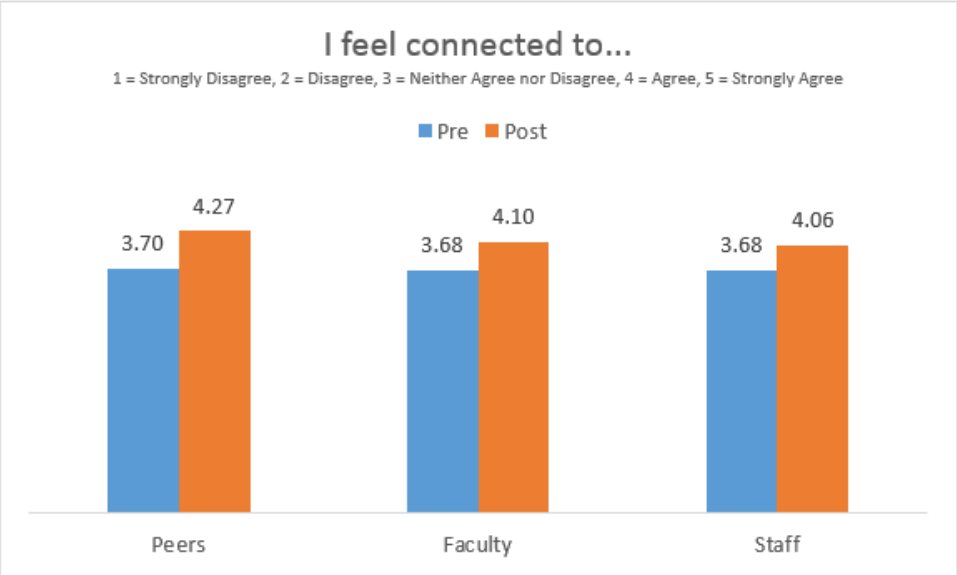
Mathematics instruction in CFS was the same as that in IMP in previous summers. Given that pass rates and progression through the developmental coursework were very similar, it is expected that similar additional academic benefits will be seen for the CFS 2015 cohort. Additionally, given the co-curricular components of CFS designed to further support students' personal development, campus connectedness, and familiarity with services and resources, it is expected that these outcomes will be even better for CFS 2015 students than they were for IMP students in previous years.

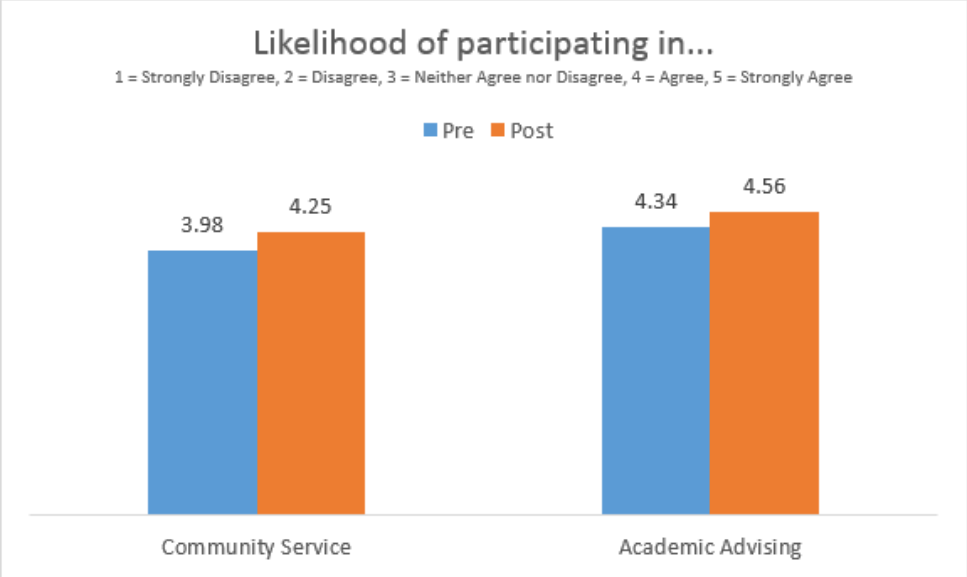
These anticipated results may be affected by institutional and other factors currently in play. For example, given the larger incoming freshman class (more than 10% larger than 2014, and almost 300 students more than the 2015 target), the distribution of academic preparation levels in the 2015 CFS cohort might be different than that in the 2014 IMP cohort. A related factor is that there were insufficient seats in freshman classes this fall for the entire incoming class to take all the courses they need in the first year. In 2014, only 28% of the students retained into the second year earned enough units to be promoted to sophomore status. This might be alleviated by the fact that more students avoided developmental coursework in mathematics, but it might be exacerbated by the fact that a higher percentage will be seeking to enroll in an insufficient number of credit-bearing courses.

Co-curricular Experience, Student Engagement and Self-Awareness

Co-curricular learning outcomes of CFS 2015 related to engagement and self-awareness were examined by analyzing the results of pre- and post-CFS surveys using paired sample *t* tests. The analysis included 934 of the 1,517 CFS participants who completed both the pre- and post-surveys. Students completed the pre-CFS survey at the start of their session and the post-CFS survey at the conclusion of their session. The survey focused on students' engagement, self-awareness, and mathematical abilities.

Results indicated that post-CFS responses scored higher than pre-CFS responses, suggesting improved student engagement and self-awareness. Paired sample *t* tests significantly supported the claim that students felt a greater connection to their peers ($t(899) = 16.34$, $p < .001$, $r = .48$), faculty ($t(904) = 12.20$, $p < .001$, $r = .38$), and staff ($t(898) = 11.03$, $p < .001$, $r = .35$) at the conclusion of CFS. Students also reported a greater sense of belonging at CSUSB following participation in CFS ($t(907) = 5.94$, $p < .001$, $r = .19$). Additionally, participation in CFS increased the self-reported likelihood of students participating in volunteer or community service ($t(903) = 9.51$, $p < .001$, $r = .30$) and seeking academic advising ($t(905) = 8.72$, $p < .001$, $r = .28$).

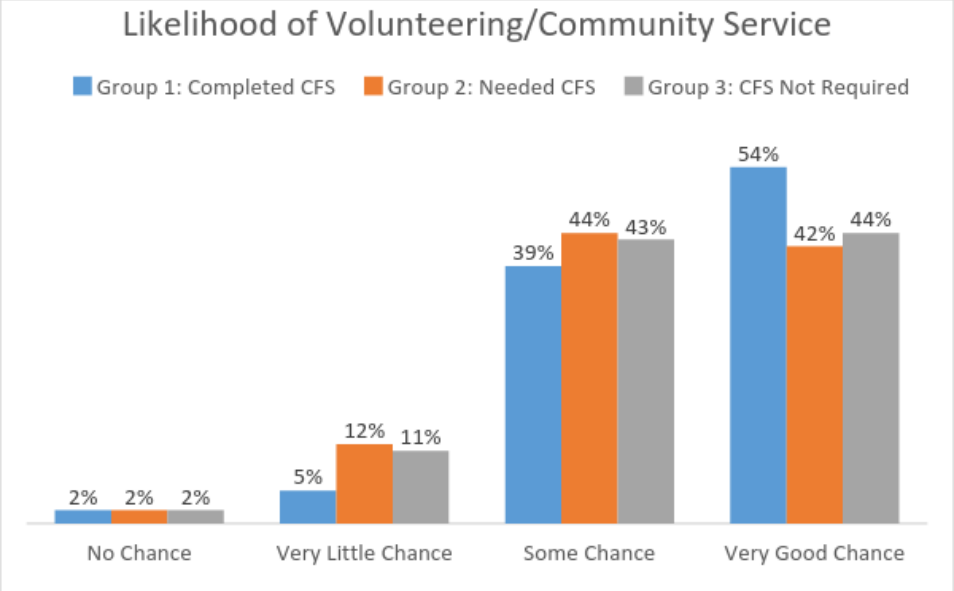


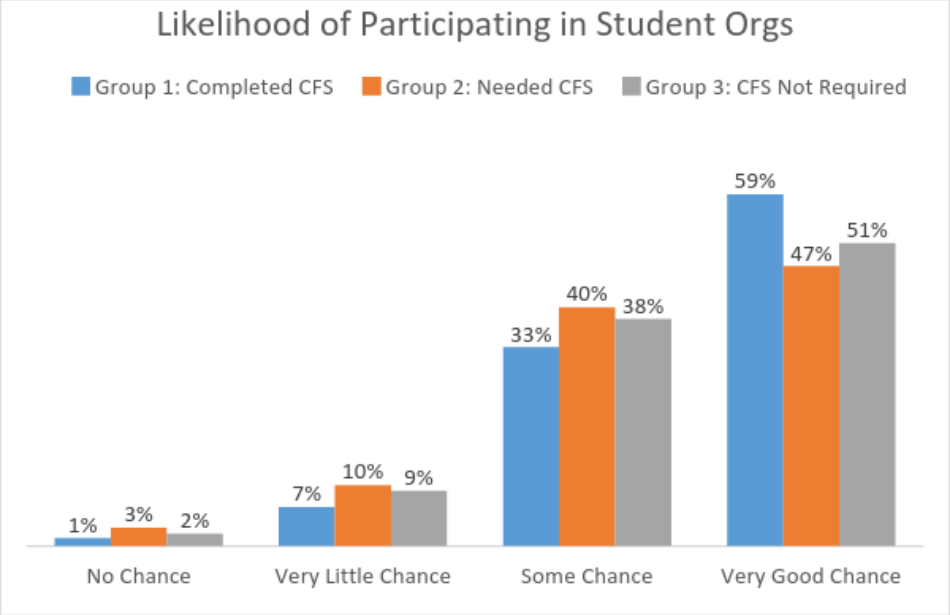


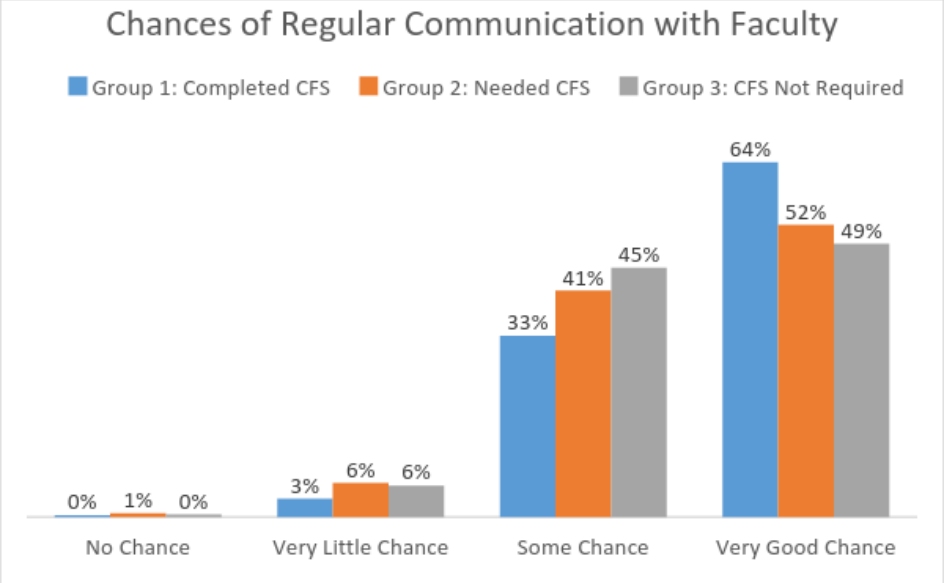
To further examine CFS's impact on students' engagement and self-awareness, results from the Cooperative Institutional Research Program of the Higher Education Research Institute (CIRP)'s "The Freshman Survey" (TFS) were compared across several groups. Students completed an abbreviated version of TFS at the conclusion of the Student Orientation, Advising and Registration (SOAR) program. The preliminary analysis included 2,008 students who completed TFS during SOAR. Results were compared for students who completed CFS before SOAR (Group 1, *n* = 542), students who completed

CFS after SOAR (Group 2, *n* = 428), and students who attended SOAR without CFS because they did not require ESM (Group 3, *n* = 1038). While these group comparisons were not based on an intervention (that is, a true experiment with random assignment), evaluating Group 1 against Group 2 and Group 3 helps determine the contribution of CFS to student learning outcomes.

On average, CFS participants in Group 1 (CFS completed before survey) scored statistically significantly higher than students in Groups 2 and 3. An analysis of variance showed a significant effect of CFS participation on the likelihood that students would participate in volunteer or community service work ($F(2,1989) = 11.1$, $p < .05$), the likelihood that students would participate in clubs/groups ($F(2,1981) = 8.9$, $p < .05$), and the chances they would communicate with professors ($F(2,1989) = 14.4$, $p < .05$). Results suggest CFS improved student engagement and self-awareness above and beyond SOAR participation.

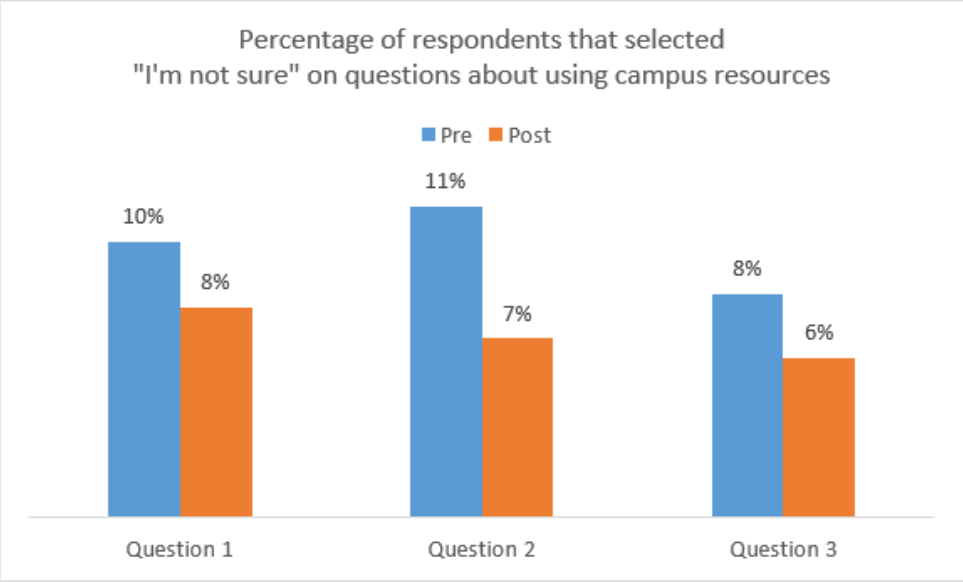






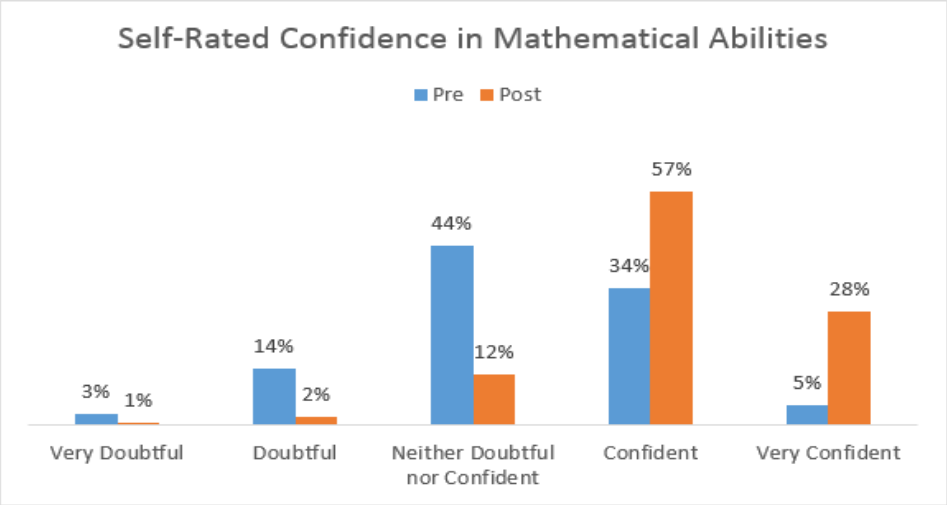
Three additional questions in the pre- and post-CFS surveys involved hypothetical scenarios which assessed students' knowledge of campus resources. There were six possible responses to these questions with more than one correct answer where students identified multiple answers. Each question included "I'm not sure" as one of the six possible responses. Between the pre- and post-test, fewer students chose this answer, suggesting that students were more likely to know where to go for on-campus support following CFS than before CFS.

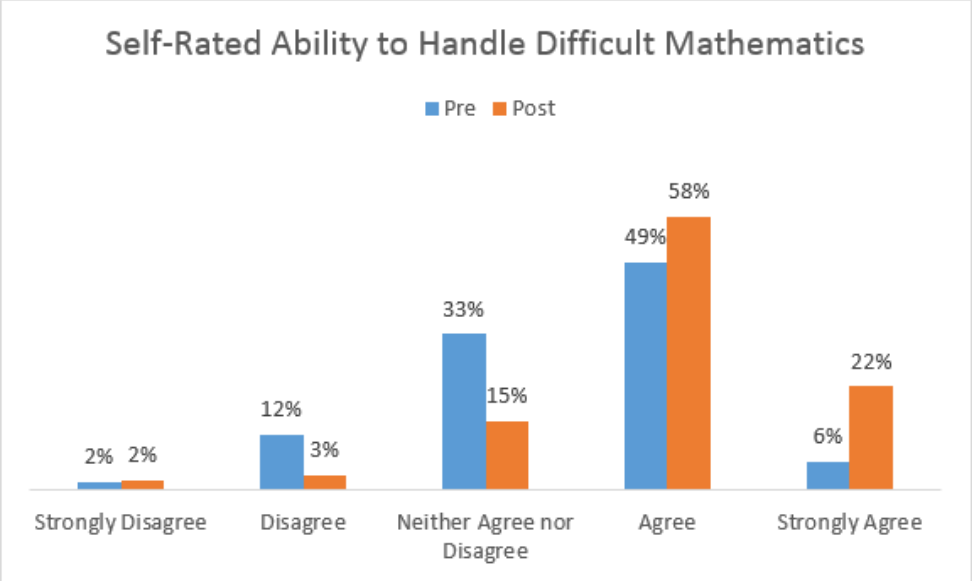
When comparing pre- to post-CFS surveys, the number of students who selected “I’m not sure” decreased significantly for the first two scenario questions (Question 1: $t(933) = -2.34$, $p < .01$, $r = .08$; Question 2: $t(931) = -3.57$, $p < .001$, $r = .12$; Question 3: $t(932) = -1.71$, $p = .09$, $r = .07$), indicating students were more aware of available resources at the conclusion of their respective CFS session. Utilizing campus resources, regardless of whether or not they were appropriate for the issue at hand, increases the likelihood of students resolving issues they may encounter.



Increased Sense of Confidence and Ability in Mathematics

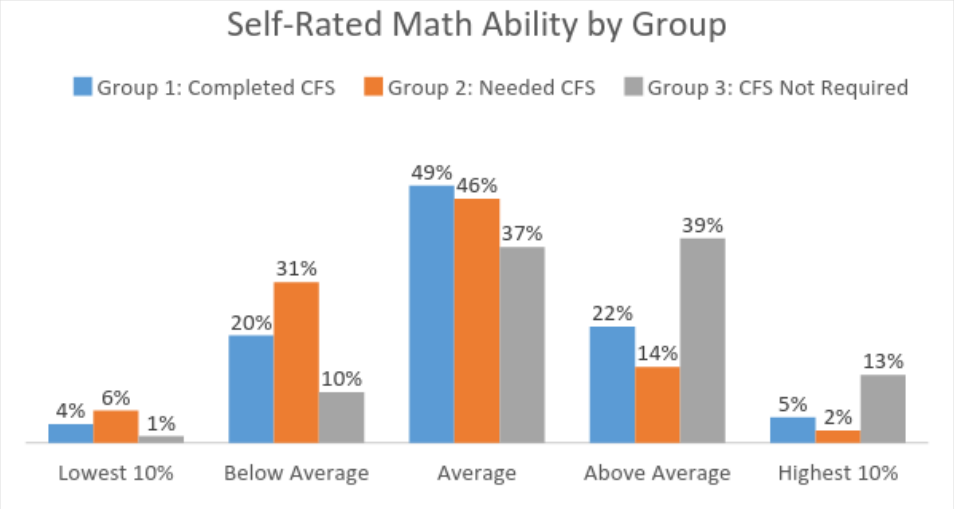
Analysis of the pre- and post-surveys suggests CFS also improved students’ perception of their mathematical abilities. Paired sample *t* tests indicated CFS significantly improved students’ confidence in their mathematical abilities ($t(900) = 29.81$, $p < .001$, $r = .70$) and ability to handle difficult obstacles they may experience in math ($t(899) = 15.23$, $p < .001$, $r = .45$).





Note in the charts above that students who rated themselves "confident" or "very confident" in their own mathematical abilities increased from 39% to 85% between the pre- and post-test. Students who rated themselves as agreeing or strongly agreeing with the statement that they felt themselves able to handle difficult mathematics increased from 53% to 80%.

It also appears (see chart below) that CFS improved mathematics academic self-concept as measured by students' responses from CIRP's The Freshman Survey. Using analysis of variance, a significant effect of CFS participation was also found on student self-rated math ability ($F(2,1984) = 131.5$, $p < .05$). While Group 3 students who did not require developmental math scored significantly higher than CFS participants (Group 1), Group 1 students scored significantly higher than those who had yet to complete CFS (Group 2).



Student Feedback on the Overall Coyote First STEP Experience

In the CFS post-survey, students were asked a series of three open-ended questions regarding their experience with CFS. Analysis of the qualitative data collected from 1,377 students who completed both the pre- and post-survey via these questions revealed several overarching or prevailing themes for each of the three questions.

When asked if they felt as though CFS was beneficial to them, students' overall responses were overwhelmingly positive (98%). The top themes that emerged through students' responses included engagement and college-life experience; connectedness to peers, faculty and staff; improved skills in math; appreciation for the program in general; and familiarity with the campus. Themes prevailing for those students who did not find the program beneficial included negative feelings regarding content and curriculum; pace; and duration of the program.

Those themes associated with positive student responses are indicated in blue; negative, in red.

When asked if they would recommend the CFS program to other students, students' overall responses were, again, nearly all positive (97%). Top themes that emerged through students' responses to this question included overall positive experience with the program; engagement and college-life experience; connectedness to peers, faculty and staff; the opportunity to make academic progress; and familiarity with the campus. Negative themes included pace; mandatory dorm stay; content and curriculum; and program rules and regulations.

Those themes associated with positive student responses are indicated in blue; negative, in red.

Students were also asked what aspect of the program they would change. Top themes that emerged through students' responses included food/dining options; days/schedule being too full; the mandatory nature of events and meetings; a change to allow students to leave campus; and a decrease in the amount of time spent with tutors. Following these themes, the next most popular theme was to change nothing about the program.

The CFS co-curricular effort also included a 24/7 comprehensive on-call system to respond to student concerns, questions, interpersonal conflicts, family inquiries and issues related to student well-being. CSUSB's CARE Team served 213 unique CFS students with on-call response and provided additional assistance through 145 phone calls. In addition, the CFS on-call team responded to 52 CFS incidents of student misconduct and removed three students from the residential component of the program. Given familial concerns about student safety, this component of the program cannot be underestimated.

BUDGET

The initial projected cost for 1,650 students to attend CFS was $2.8 million, or about $1,697 per student. The CSU Chancellor's Office agreed to fund $1.4 million of this (from the total of $8 million in devoted annually to Early Start for the 23 campuses in the CSU system). Three high school superintendents agreed to provide partial funding for students from their districts who needed Early Start Math, for a total of $168,000 (from their Local Control Funding allocated by the Governor for college readiness initiatives). Along with the Chancellor's Office, CSUSB covered the remainder of the program costs.

According to the budget reconciliation available at the time of the production of this report, total costs for Coyote First STEP 2015 were about $2.3 million, about $500,000 lower than originally projected. 1,517 unique students attended, including 147 who attended two sessions (for an effective total of 1,664). Subtracting the funding contributed by the Chancellor's Office and local school districts (see above) leaves about $732,000 to be covered by CSUSB (about $537 per student). Note (as detailed in the Results section) that the success of CFS means that the university will not have to teach 60 sections of developmental math during the regular school year, which produces a savings in instructional costs of $240,000 and a savings in other indirect costs of $115,000. Not including this last figure, the total effective cost to CSUSB was $296 per student; when the indirect savings are included, the effective cost to CSUSB is $377,000 or $227 per student.

PLANS FOR ADDITIONAL ASSESSMENT OF COYOTE FIRST STEP

Preliminary results indicate that CFS is successful in reducing the need for developmental coursework, fostering a sense of connectedness to CSUSB, and increasing students' mathematical self-efficacy as they begin their first academic year.

Future analyses will investigate students' performance in GE Mathematics courses, unit accumulation, GPA, retention, and graduation rates and examine the mediating or moderating effects of connectedness, academic self-efficacy and math self-confidence between CFS and student success outcomes. A proposed timeline for these additional analyses is provided below.

Survey of CFS Students (mid-November 2015 deployment; December 2015 expected analysis). This survey will serve to measure students' continued sense of engagement, connectedness, self-awareness and confidence in math mid-way through their first quarter. By allowing time for students to have taken and received feedback on their midterms, they should have an increased sense of how they are faring in their classes. The survey will also ask students to self-report any utilization of on-campus resources and engagement in co-curricular programs. The survey will also ask students to reflect upon their summer CFS experience and how it has affected them in the first term of college.

Feedback from Instructors of First-Year Classes (January 2016). This brief electronic survey will gather informal qualitative feedback from instructors of classes commonly taken by freshmen in order to determine whether they notice any significant differences between the 2015 FTF cohort and previous cohorts. Given initial informal feedback, it is expected that instructors will

report a change in student culture, intellectual and motivational attitudes, and an increase in academic skills are all expected.

Audit of Usage Rates of Campus Resources (e.g., advising, tutoring, peer mentoring) (January 2016). By auditing the usage of several campus support services, including but not limited to advising and Testing & Tutoring, the goal is to determine if CFS students, proportionally, engaged with on-campus resources more than their non-CFS peers. Barring possible limited availability of historical sign-in or usage data, the audit will also examine whether the Fall 2015 FTF cohort sought out support services more often during their first quarter at CSUSB than did previous cohorts.

Analysis of First Quarter Grades, Course Attempts, and Course Completions (January 2016). This analysis will include comparing CFS participants to their non-CFS peers in the fall 2015 FTF cohort, as well as previous FTF cohorts and IMP cohorts.

CFS Family Focus Groups (January 2016). The proposed focus groups will invite parents of CFS participants to reflect upon their own perspectives on CFS. Questions will ask how CFS impacted their student's performance in and experience during their first term at CSUSB, how the CFS experience may have affected parents' knowledge of or ability to support their students during their first quarter at CSUSB, and how the CFS experience may have impacted their families or home life.

Analysis of First Year Grades, Retention, Course Attempts, and Course Completions (Summer 2016). This analysis would include comparing CFS participants to their non-CFS peers in the fall 2015 FTF cohort, as well as previous cohorts.

DISCUSSION

Why Does CFS Work?

To make the story of the CFS experience at CSUSB more valuable to other institutions who may wish to emulate our program, it is important to be able to articulate why a design like CFS produces such good outcomes. What is it that makes it work?

The first point is that there is nothing ground-breaking or new about any of the components of CFS. They have all been tried elsewhere, and the research shows that they work: living on campus, summer bridge programs, learning in cohorts, tutored homework sessions, intensive and immersive learning experiences, high expectations paired with high levels of support, peer leaders, campus engagement opportunities, etc., all have very strong bases in the literature as techniques for promoting success in developmental education, and in college in general.

What is, perhaps, distinctive about the CFS design is its scale and extent—in other words, the complete commitment of the university to making a real difference for students. CSUSB created a "summer bridge" developmental math program that was mandatory for all students with an ESM requirement,

served all 1,650 FTF with developmental math needs, had them all live on campus for three to four weeks (depending on their placement level), provided room and board and offered 199 co-curricular programs—all entirely free to the students.

The overall lesson for other universities that may wish to emulate Coyote First STEP is that what works to promote student success is well known; institutions just have to commit to actually doing it. This requires a considerable investment from administration (in terms of both financial and political capital) and a massive effort from a very large multi-divisional team. Students deserve no less.

More specifically, though, what are the design factors that help produce the CFS's results?

1. Residential: CSUSB only has 1,400 on-campus beds for its 20,000 students, so most students do not live on campus during the school year. Giving CFS students the opportunity to live on campus for a month allowed them to have access to many of the benefits the research shows are associated with living on campus. This included forming closer attachments to peers and staff, learning institutional norms, knowing campus resources and geography, feeling a sense of belonging, etc. Moreover, many of CSUSB's FTF are from low-income households and would have been challenged to commute to campus each day of the summer program.

2. Immersion: Students in CFS are really doing only one thing, namely completing math courses. In the regular school year, students may be distracted by the demands of other courses, family obligations, off-campus social enticements, working for pay and so on. In CFS, most of those distractions are eliminated most of the time.

3. Intensity/Pace: Similar students who take the same developmental math courses from the same instructors during the regular school year do not have such good outcomes: many fewer finish the courses, and other measures of success are lower as well. Quite likely, this effect is due at least in part to the fact that CFS provides math instruction in an intensive, fast paced environment. There are no "gaps" between instructional days for students to drift away or lose focus.

4. Duration: Students spent up to six hours per day for three to four weeks in classroom instruction and peer-tutor-guided practice. This amount of time-on-task should "move the needle" on math knowledge and skills development. Note that instead of requiring homework (which might or might not be completed), CFS does the same amount of practice in a controlled environment with mandatory attendance.

5. Mandatory: Sometimes the freedom and choice we want college students to have are enemies of completing their requirements and degrees. If we are talking about a "must do" requirement that has to be completed within a certain period in order for other aspects of the degree to be completed successfully and on time, eliminating the option to *not* complete it successfully and on time makes good sense. Similarly, we do not allow students to complete freshman orientation at the end of their first year. In this respect, making it mandatory for students to

attend CFS was much more likely to put them on a path to timely graduation than giving them the option not to attend.

6. FREE: CSUSB serves a student population that is predominantly low-income and first-generation in an economically and socially challenged region, so making the program "no cost to students" was crucial. Without this, many students would have been unable to attend or would have accumulated student debt even before starting as freshmen. Making it free showed students and families how seriously CSUSB takes their success and the strength of CSUSB's commitment to and investment in supporting students and making an impact in the community it serves.

7. Co-curricular programming: CFS involved a comprehensive co-curricular experience: creating a sense of belonging and connectedness; developing help-seeking behaviors; learning how to access campus resources; developing time-management and conflict management skills; and initiating family conversations about mutual expectations during the student's college experience. 199 events produced 35,000 hours of student engagement with the campus that they would not have had without CFS, and might otherwise never have had in their entire careers on our campus. In this respect, as a cohort the 2015 CFS students are very likely the best prepared FTF class that CSUSB has ever seen.

8. High expectations coupled with high support: CSUSB students, regardless of placement exam scores, are fully capable of succeeding. Therefore, labels such as "remedial" or "developmental" were rarely used. Instead, instructors and tutors were expected to focus on helping students build upon their current knowledge and develop a positive connection with mathematics. This can be especially helpful with students who may have experienced on-going challenges with mathematics during their K-12 experience.

9. Faculty mathematics coordinator: The faculty coordinator for mathematics focused on the recruitment and retention of instructors who believe in the ability of all students to learn and succeed in mathematics regardless of placement exam scores. Additionally, the coordinator met regularly during the program with tutors and instructors to address problems, plan, and ensure the program was functioning optimally.

10. Tutors: CFS tutors were not required to be mathematics majors. Instead, students who have been successful in their general education mathematics courses and who have a commitment to student success were considered desirable candidates. Many tutors are former participants in the Intensive Mathematics Program (the core of the CFS mathematics pedagogical model). This means that the students can relate well to their tutors, they see models of near peers "just like them" that succeeded in the program, and the tutors are able to explain concepts at the level of the students. (Sometimes people who are very good at a subject are not the best explainers of it.) Tutors were selected in part on the basis of their ability to explain a complex mathematical problem to interviewers. CFS tutoring sessions were designed to provide students with a

relaxed and supportive environment where they could practice the math concepts from class and develop effective study strategies.

11. Cohorts of meaningful size: CFS utilized cohorts of 22 students. Each cohort was together for English, math instruction, math tutoring and (to the extent possible given gender ratios and the need to house minors separately) lived together. This means students also studied, ate, recreated and attended co-curricular events together, enhancing social connection and sense of belonging.

12. Intentional opportunities for building connectedness and collaboration: Students were grouped with peers in a manner which normalized mandatory participation in a summer program and avoided the stigma often associated with developmental coursework requirements. Students were intentionally connected with other students with whom they could relate and work collaboratively toward their common goals.

13. ELM perhaps does not adequately measure preparation: Students might really be ready before ESM. This could be the case if the students did not give their best effort on the test (for example, at CSUSB we notice that many students seem to take the EPT/ELM on the day of prom). Similarly, it is possible that the test does not adequately distinguish readiness levels. And students who are not good test-takers may not be able to demonstrate their readiness despite actually have the skills and knowledge.

Coyote First STEP is part of the initiative to increase college readiness and graduation rates at CSUSB and is designed to ensure students are on a solid footing for timely graduation by reducing developmental course requirements, enhancing social connections among students and forging a sense of belonging at CSUSB. Preliminary findings indicate Coyote First STEP reduced developmental course requirements; enhanced students' feelings of connectedness to and engagement on campus; increased students' awareness of on-campus resources; and increased students' sense of confidence and ability in mathematics. These outcomes are consistent with the goals of the CSU's Graduation Initiative 2020, the CSU's six Trustees' Initiatives launched in spring 2015, and with CSUSB's strategic plan launched in fall 2015.

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APPENDIX A

CFS Participants and Success Rate by Local School District

School District	CFS Participants	Avg # of DE Math Quarters Required (Pre-CFS)	# Made GE Ready	% Made GE ready	# Reduced, but Not GE Ready	% Reduced, but Not GE Ready	Success Rate	Avg # of DE Math Quarters Reduced
Apple Valley Unified	11	2.1	6	55%	5	46%	100%	1.1
Banning Unified	9	2.3	4	44%	4	44%	89%	1.6
Beaumont Unified	15	1.8	10	67%	3	20%	87%	1.2
Chaffey Joint Unified High	150	1.9	110	73%	33	22%	95%	1.5
Coachella Valley Unified	19	2.3	14	74%	5	26%	100%	1.8
Colton Joint Unified	39	2.1	25	64%	13	33%	97%	1.5
Desert Sands Unified	19	1.9	13	68%	5	26%	95%	1.4
Fontana Unified	152	1.9	105	69%	35	23%	92%	1.4
Hesperia Unified	71	2.1	44	62%	22	31%	93%	1.4
Jurupa Unified	36	2.0	30	83%	6	17%	100%	1.7
Moreno Valley Unified	96	2.1	69	72%	22	23%	95%	1.5
Morongo Unified	2	2.0	0	0%	2	100%	100%	1.0
Nuview Union	3	1.7	3	100%	0	0%	100%	1.7
Palm Springs Unified	27	2.1	13	48%	11	41%	89%	1.3
Private Riverside	8	2.1	4	50%	4	50%	100%	1.4
Private San Bernardino	23	1.8	18	78%	2	9%	87%	1.5
Redlands Unified	41	1.8	26	63%	12	29%	93%	1.2
Rialto Unified	117	2.0	77	66%	35	30%	96%	1.5
Rim of the World Unified	9	1.8	6	67%	3	33%	100%	1.2
Riverside Unified	72	1.9	56	78%	13	18%	96%	1.5
San Bernardino City Unified	172	2.1	99	58%	60	35%	93%	1.3
Victor Valley Union High	43	2.2	23	54%	15	35%	88%	1.3
Yucaipa-Calimesa Joint Unified	6	2.0	5	83%	1	17%	100%	1.5
NonLocal	291	2.1	187	64%	82	28%	93%	1.4
Total	1431	2.0	947	66%	393	28%	94%	1.4

APPENDIX B: SUPPLEMENTAL ANALYSIS

Hidden Cost of Developmental Coursework Units

The following analysis seeks to measure the cost of first-year developmental math units when fall 2014 first-time freshmen were not retained in fall 2015 or when fall 2011 first-time freshmen took up to four years of developmental math coursework and were not retained in fall 2015. These would be the costs associated with students who took developmental math and were not able to reach the level of college math readiness. In essence, these are "wasted" units with zero return on investment. These costs are avoided if a summer math program can help students get to GE-Math-Ready before their first term of enrollment.

A total of 68 fall 2014 first-time freshmen attempted developmental math coursework during the 2014-15 academic year, did not pass Math 90, and were not retained for fall 2015. Over the course of the year, these 68 students attempted a total of 476 developmental math units, including 104 units of course repeats. At a cost to students of $353 dollars per unit, this totals $168,028 of developmental course units that did not make them college-math-ready. Given four units per course, this is equivalent to 119 seats. With an average limit of 34 seats (Math 75 at 28 seats and Math 80/90 at 40) per section, roughly 3.5 sections of developmental math would be needed to accommodate these 109 students. At a typical cost to the university of $4,000 per section, these 3.5 sections would cost $16,000.

Examining the fall 2011 first time freshmen cohort, a total of 109 students attempted developmental math coursework between 2011 and 2015, did not pass Math 90, and were not retained for fall 2015. Over this four year period, these 109 students attempted a total of developmental 1,144 units, including 388 units of course repeats, costing them $403,832 for developmental course units that did not prepare them to be college-ready. This is equivalent to 286 seats and roughly 8.4 sections at a cost of $33,600 to the university.

Since the 4-Year Graduation Rate for students who are not GE-Math-Ready in their first fall is a dismal 7% (a still-disappointing 17% for those who are GE-Math-Ready) an argument could be made that ALL of the units a student takes when they have developmental math needs and then drop out are wasted.

The upshot here is that the university saves money through the success of CFS not just in developmental mathematics seats avoided in the regular school year, but also "wastes" less money on developmental mathematics seats that are futile/unproductive in the sense that students taking them do not become GE-Math-Ready and are not retained.

ABBREVIATIONS

ACT	American College Testing (the corporation, and the test for college-bound high schoolers)
CFS	Coyote First STEP (Student Transition Enhancement Program)
CIRP	Cooperative Institutional Research Program of the Higher Education Research Institute
CO	Chancellor's Office (of the California State University system)
CR	Credit (for making progress toward college readiness in Math or English)
CSU	The California State University (system of 23 campuses)
CSUSB	California State University, San Bernardino
DE	Developmental Education
EAP	Early Assessment Program (a test of college readiness given to CSU-bound high school juniors)
EFC	Estimated Family Contribution
ELM	Entry Level Mathematics (CSU placement test)
EPT	English Placement Test (CSU placement test)
ES (or ESP)	Early Start (or Early Start Program)
ESE	Early Start English
ESM	Early Start Math
FTF	First Time Freshmen
GE	General Education
IMP	Intensive Mathematics Program
PDC	Palm Desert Campus of CSUSB
RP	(Report in Progress) Satisfied Early Start Requirement but did not progress
SAT	the College Board's Scholastic Aptitude Test
SOAR	Student Orientation, Advising and Registration
STEP	Student Transition Enhancement Program
TFS	The Freshman Survey (from CIRP)