RESEARCH REPORT

OFFICE OF INSTITUTIONAL EFFECTIVENESS AT FULLERTON COLLEGE

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STEM SUCCESS LEARNING COMMUNITY FIVE-YEAR OUTCOMES

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INTRODUCTION

Program Background

The STEM Success Learning Community (STEM SLC) is a first-year experience and beyond program that supports students as they pursue STEM major/career pathways. The mission of the STEM SLC is to "Connect- Support- and Complete". Established in Fall 2016, the program provides students with comprehensive wraparound services within a supportive learning environment, no matter what the educational goal in STEM.[1]

Purpose

The purpose of this report is to understand the potential impact of the STEM SLC program on long-term student outcomes such as degree attainment, persistence, and transfer rates. While the program regularly monitors course completion, this report is the first systematic analysis assessing the program's impact on key milestones along a student's college-to-career trajectory. This type of analysis is important not only to validate the program's efficacy, but also to advocate for sustained staffing and funding sources should the program be found to positively impact student's goal completion.

Data Sources

Two primary data sources were used for the analysis presented throughout this report: The National Student Clearinghouse, and North Orange County Community College District's (NOCCCD) local DataMart. The comparison group was identified using a third data source from the State Chancellor's Office, referred to as the "first file".

The National Student Clearinghouse (NSC) data used throughout this report was obtained from NSC in November of 2021 and included information on student's post-secondary enrollment and areas of study for all Cypress College and Fullerton College students dating back to 1992.

Demographic and academic data for students included in the report was obtained through NOCCCD's local DataMart. Data was pulled during the summer of 2021 which allowed ample time for spring 2021 term data to be entered and compiled. Degree data was then updated once more in January 2022.

Methodology

Given that many students in the STEM SLC pursue programs that have a high unit load and have traditionally been perceived as academically challenging, a comparison group of students with similar academic interests was established to allow for more targeted and relevant comparisons.

The comparison group included students entering Fullerton who were first-time, credit-seeking students in the California Community College system (excluding special admits), and had declared a major in

[1] Excerpted from https://stem.fullcoll.edu/stemslc/

Engineering, Biology, Computer Science, Chemistry, Mathematics, Physics, or Interdisciplinary Studies (IDS) Science & Math. The comparison group was then further divided by the academic year students entered so that each cohort of the STEM SLC had a corresponding group of comparison students. The comparison group was then reviewed and any overlapping students participating in the STEM Learning Community were removed. The file from which students were identified is only updated through the 2019-20 school year, and therefore a comparison group for the 2020-21 cohort is not available.

The STEM SLC cohorts were established and tracked by the program leadership each academic year. A list of student ID's was shared with the Office of Institutional Effectiveness to conduct the analysis presented.

	# of Students in STEM SLC	# of Students in Comparison Group
GRAND TOTAL	**322**	**2915**
AY 2016-17	26	779
AY 2017-18	59	798
AY 2018-19	73	690
AY 2019-20	88	648
AY 2020-21	76	N/A

Data queries to obtain demographic and academic data for this report were extracted from NOCCCD's DataMart. Unless otherwise noted, students' academic history represents the student's coursework across all NOCCCD credit institutions.

KEY FINDINGS

1. Students in the STEM SLC had higher rates of degree attainment and transfer when compared to other students from the comparison group.
2. Unit accumulation among STEM SLC students is still relatively high for award earners – nearly 12 units (approximately 4 courses) over the goal set in the *Vision for Success*.
3. Although females make up a little over half of the students at Fullerton, they are stubbornly under-represented in STEM majors. The comparison group reflected this trend with roughly one-third of the cohort identifying as female. In contrast, the STEM SLC has been effective at recruiting female students into the program with 45% of this cohort identifying as female.
4. Students in the STEM SLC were more likely to continue pursuing their academic goals at Fullerton College than students in the comparison group as demonstrated by less students discontinuing their education at Fullerton before obtaining a degree or certificate.

DEMOGRAPHICS

Unlike some programs at Fullerton College, the STEM SLC does not conduct outreach or recruitment based on student's demographic make-up. Instead, the recruitment and selection process are driven by the student's academic history, their prior participation in Fullerton's Dual Enrollment program[2], and their interest in pursuing a STEM career. While program leadership has an interest in serving a group of students

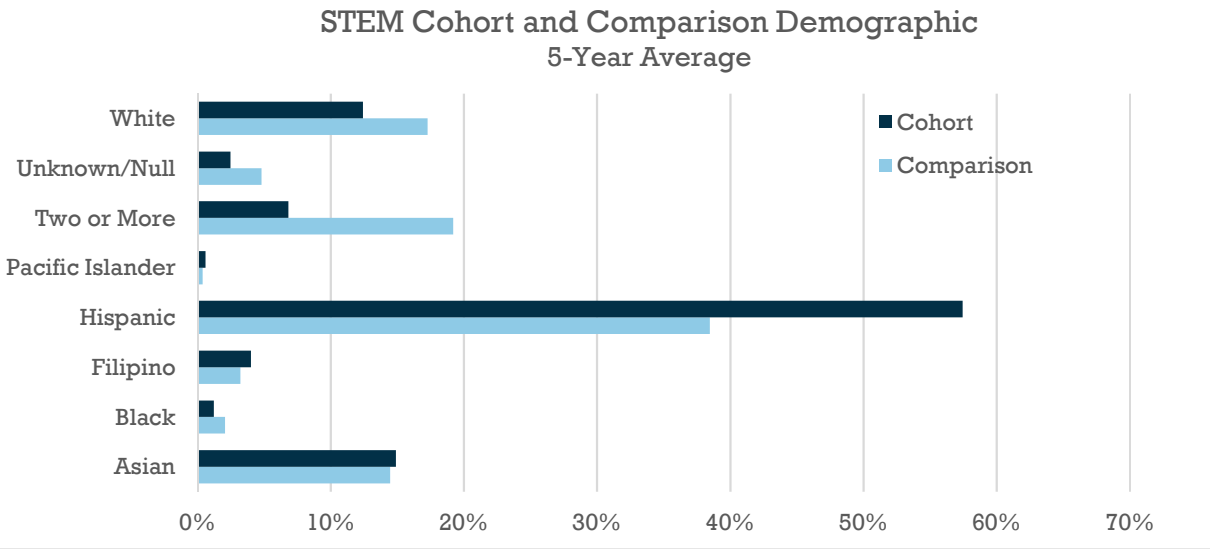
[2] This criterion was added in 2019/20 when Fullerton was awarded a Title V grant which focused on creating career pipelines for students.

that aligns to the demographic diversity at the college, it is not yet the primary driver of their program selection.

Racial/Ethnic Background

Overall, the STEM SLC demographic make-up is consistent with the general demographic trends of the college. There are small, but notable differences though in the percentage of black and white students, with each slightly less represented in the cohort than in the overall student body.

When compared to other first year students entering Fullerton with a STEM major, the STEM SLC has a larger proportion of Hispanic students, while the comparison group has more students who identify as two or more race/ethnicities or as white.



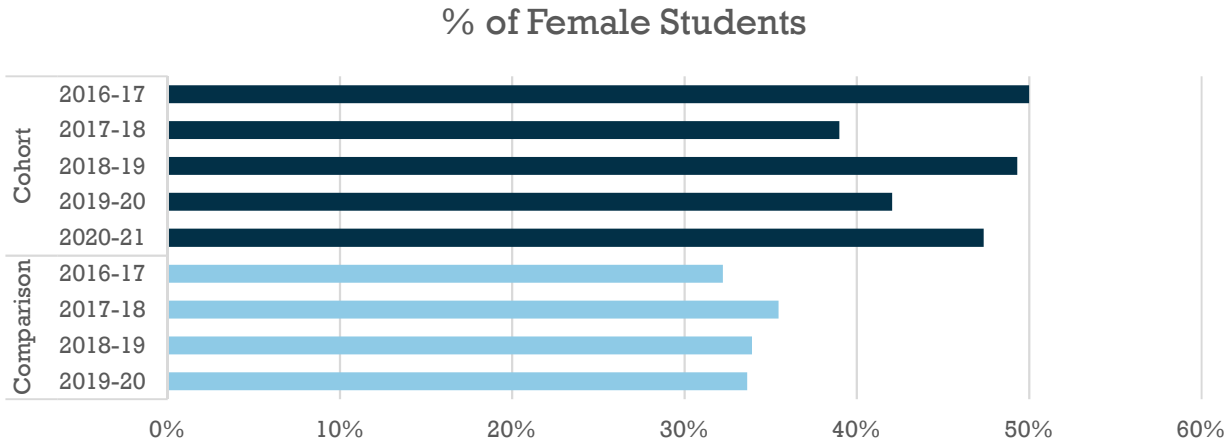
There have also been some notable shifts in the demographic make-up of the cohort over the last five years. The percentage of black and white students in the cohort have both been on the decline over the past five years, while the number of Hispanic students has risen. While the college has seen a decline in white students over the same period, the decline in black students is not reflected at the college level or in the comparison group.

	AY 2016-17	AY 2017-18	AY 2018-19	AY 2019-20	AY 2020-21
Asian	11.5%	18.6%	17.8%	11.4%	14.5%
Black	3.8%	0.0%	2.7%	0.0%	1.3%
Filipino	3.8%	3.4%	5.5%	3.4%	3.9%
Hispanic	53.8%	55.9%	56.2%	56.8%	61.8%
Pacific Islander	0.0%	0.0%	0.0%	2.3%	0.0%
Two or More	7.7%	5.1%	4.1%	8.0%	9.2%
Unknown/Not Available	0.0%	1.7%	2.7%	5.7%	0.0%
White	19.2%	15.3%	11.0%	12.5%	9.2%

Gender Identification

It is well documented that females have long been under-represented in STEM fields; this unfortunately holds true at Fullerton College as well, with only one-third of students in the comparison group identifying

as female, compared to roughly 50% of the Fullerton student body. It is therefore encouraging that over the past five years, the STEM SLC has been 45% female; this suggests that the STEM SLC may be an important vehicle for creating a community and sense of belonging among female STEM students on campus.



First-Generation

Over the past four years, approximately 45% of the students at Fullerton are the first in their family to attend college.[3] This trend holds true for both the comparison (44.3%) and cohort (46.0%) groups. When broken out by year, a slight uptick in the percentage of students considered first-generation for both the comparison and cohort groups is present in 2018-19; those gains were sustained in the comparison group while the cohort group saw another dip in 2019-20 and then another rebound in the most recent cohort.

	STEM Cohort	Comparison
% of Students first to attend college	45.96%	44.32%
% of Students first to earn a post-secondary degree	57.76%	63.19%

Low-Income

In general, the STEM SLC has a slightly lower percentage of students who would qualify as low-income based on the California Promise Grant eligibility guidelines. Both the comparison and cohort groups saw their peak number of Promise Grant eligible students in 2018-19 and have been declining over the past few years.

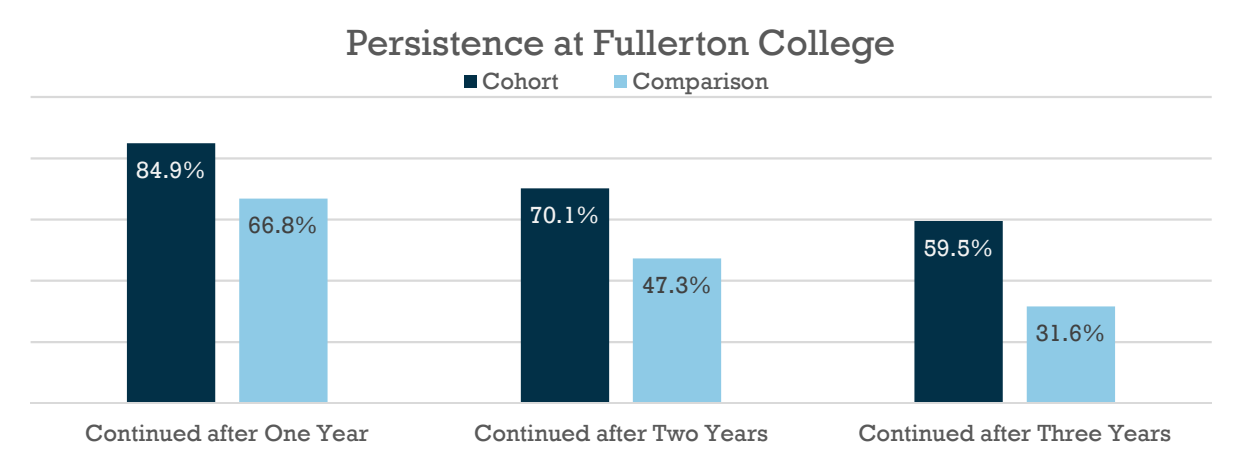
PERSISTENCE

One early indicator of student success is a student's term-to-term persistence in their academic program. All too often, students beginning their post-secondary journey at a community college end up leaving higher education without ever having obtained an award or achieving their transfer goals. While the reasons a student may pre-emptively end their educational journey are no doubt varied and highly individualized, the STEM SLC model does ameliorate some of the key systemic factors that contribute to students leaving. Through the STEM SLC, students enter into a pre-built community of their peers - this leads to a sense of belonging that some students struggle to find in the often transient nature of community colleges. Students

[3] In the context of this report, students are considered first generation if neither of their guardians attended college.

also receive individualized and consistent counseling support in course selection and career and/or transfer planning which helps increase connectedness and focus on completion of their academic goals.

Data show that through these efforts, the STEM SLC is effective at improving a student's likelihood to continue their academic journey at Fullerton when compared to students in the comparison group. While the impact is evident even after one year, the gap grows substantially in years two and three.



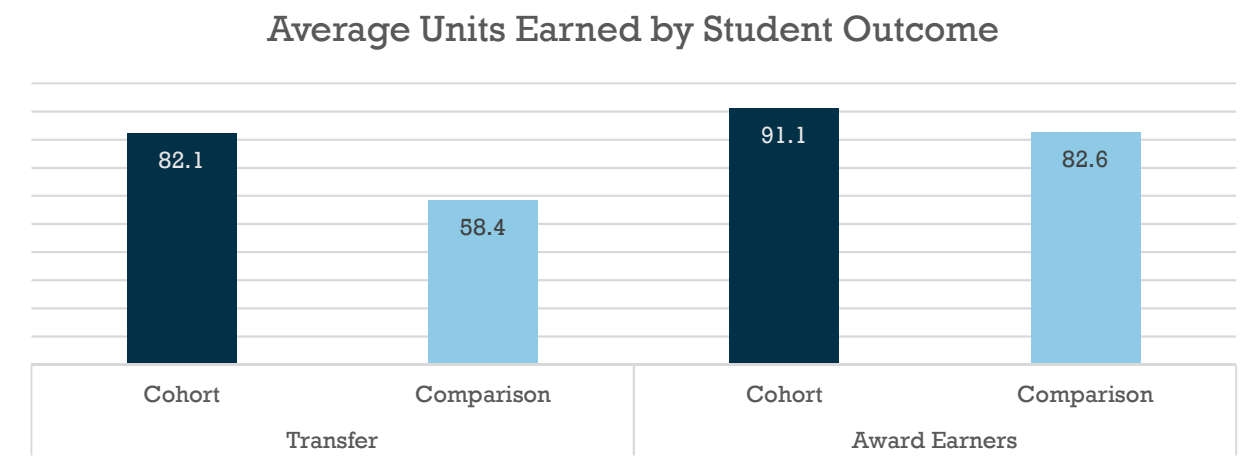
NOTE: The criteria used to determine persistence was students being enrolled in at least one term the following academic year, or having graduated during the last target term. For example, students in the 2016/17 cohort would have had to be enrolled in Fall 17 and/or Spring 18 to be considered as continuing after one year. The same students would have had to be enrolled or graduated in Fall 18 and/or Spring 19 to be considered as continuing after two years.

UNIT ACCUMULATION

In 2017, the California Community College Chancellor's Office introduced the *Vision for Success* – a five-year plan aimed to hold California Community Colleges accountable to a set of shared metrics designed to ensure that the system is well positioned to continue meeting the needs of students and preparing them to be successful in an ever-changing economic environment. One of these goals focused on decreasing the number of extraneous units earned by students, thereby decreasing their financial burden and time to degree. The goal set an ambitious target of decreasing the average number of units earned from 87 to 79 over the next five years (2017-2022).[4]

Over the past five years, degree earners in both the comparison and cohort groups accumulated well over 60 units; degree earners in the STEM SLC averaged 91.1 units and degree earners in the comparison group averaged 82.6 units before receiving an award. While this is not totally unexpected given that STEM programs typically require more than the 60-unit minimum typical of most Associate Degrees[5], the discrepancy between the cohort and comparison does warrant further inquiry. This discrepancy grows even wider when looking at students obtaining transfer; students obtaining transfer from the comparison group accumulated an average of 58.4 units while transfer students from the cohort accumulated and average of 82.1 units.

[4] Foundations for California Community Colleges. "Vision for success: Strengthen the California community colleges to meet California's needs." Accessed July 2021. https://foundationccc.org/Vision-for-Success
[5] The lab requirements of STEM programs push the minimum unit load over 60.



Potential explanations for why students in the STEM SLC cohort accumulate more units prior to transfer is that through additional coursework, students are attempting to increase their GPA to make themselves a more competitive applicant, or gain entry into universities with more rigorous transfer requirements. While further analysis would need to be done to confirm this theory, data does show that students who transfer from the cohort have a slightly higher GPA than students in the comparison group.

DEGREE ATTAINMENT

A primary goal of the STEM SLC is to promote successful outcomes while guiding students to complete their academic goals. The program's mission statement, "Connect-Support-Complete", embodies this and carries with it consistent efforts made towards increasing student awareness of transfer and degree options. One of those academic goals shared by many students is to obtain a degree.

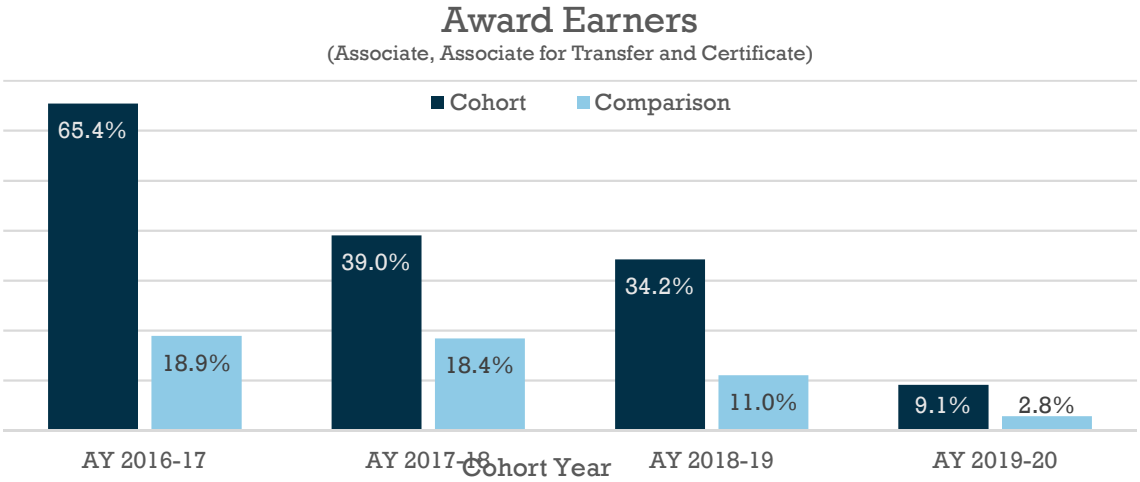
Degree attainment across the California Community College system has long been a source of concern; only 48% of students across the system earned a degree or certificate within six years[6]. Additionally, only 4% of students enrolled in the system earned an Associate's Degree over the past three years (2017/18 – 2019/20) [7]. Furthermore, most STEM SLC students come to Fullerton College with the main goal of transferring to a university; degree attainment related to coinciding STEM career fields is oftentimes overlooked, at least initially. Knowing this, counselors have worked diligently to increase the awareness of STEM related degree/certificate opportunities present at Fullerton College. When appropriate for the individual student, counselors help students create educational plans that outline efficient pathways to accomplish both transfer and degree completion within the same timeline.

Following this, the rate at which students in the STEM SLC earn a degree is quite promising given the system-wide statistics; over 65% of students who started in the STEM SLC in 2016/17 earned an award in

[6] Foundations for California Community Colleges. "Vision for success: Strengthen the California community colleges to meet California's needs." Accessed July 2021. https://foundationccc.org/Portals/0/Documents/Vision/VisionForSuccess_web_2019.pdf

[7] California Community Colleges. Student Success Metrics Dashboard. https://www.calpassplus.org/LaunchBoard/Student-Success-Metrics. Accessed January 2022.

under four years, well above the six-year award rate system-wide (48%). [8] Furthermore, only 19% of students from the comparison group had earned an award in the same amount of time. The difference in degree attainment becomes even more pronounced when focusing on Associate and Associate for Transfer degrees. Across the system, only three to four percent of students have earned an Associate's and between one and three percent have earned an AD-T over the past five years.[9] Meanwhile, 23% of all cohort students have earned at least one Associates degree, and nine percent have earned an AD-T.



While STEM SLC students are obtaining AD-T's at a higher rate than the system-wide average, they are still less likely to obtain a degree for transfer (29%) than the comparison students (40%). One reason for this, as seen in the section that follows, is that STEM SLC students are more likely to transfer to a UC campus than the comparison group. Associate Degrees for Transfer are, specifically, for students transferring into the CSU system and are pursued less often by STEM students because they are not widely beneficial across the CSU system (especially locally). Additionally, Associate Degrees for Transfer require completion of transfer General Education patterns (CSUGE, IGETC) that STEM students do not always complete because of the primary focus on admission standards and major preparation courses. Furthermore, STEM majors offered at UC campuses are often categorized as having "selective" admission requirements. Students that pursue transfer to schools with selective majors will typically accumulate a high unit total at the community college in order to meet admission standards as well as to be competitive applicants. STEM SLC students receive comprehensive counseling follow up each term they are active in the program, which results in course selection patterns that move them efficiently to their academic goals. Ultimately, this can be seen in the types of degrees that students in the program pursue as well as the transfer universities where they end up attending.

A deeper look at the data also shows that students in the STEM SLC are more likely to obtain a degree in a STEM discipline when compared to other students entering with a declared STEM major. Among cohort students, four out of the top five Associates or Associate for Transfer degrees awarded were directly related

[8] Foundations for California Community Colleges. "Vision for success: Strengthen the California community colleges to meet California's needs." Accessed July 2021. https://foundationccc.org/Portals/0/Documents/Vision/VisionForSuccess_web_2019.pdf

[9] California Community Colleges. Student Success Metrics Dashboard. https://www.calpassplus.org/LaunchBoard/Student-Success-Metrics. Accessed January 2022.

to STEM whereas in the comparison group, only two out of the top five degrees awarded were STEM degrees.

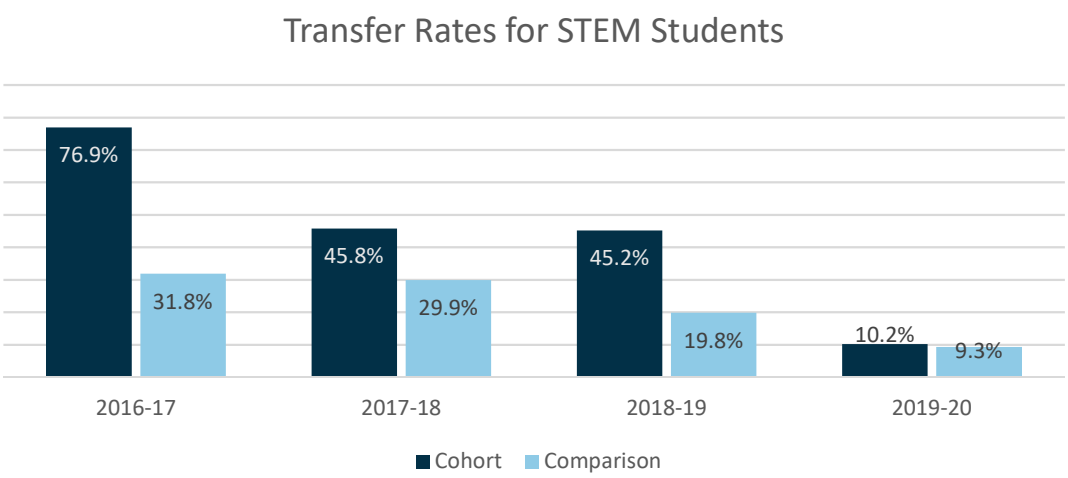
TOP 5 ASSOCIATES OR ASSOCIATES FOR TRANSFER DEGREES			
STEM Cohort		Comparison Group	
Degree Name	N	Degree Name	N
IDS: Science & Mathematics	38	IDS: Science & Mathematics	127
AA Chemistry	21	IDS: Social Sciences	57
AS Chemistry	16	IDS Arts & Human Expression	52
AA Biology	14	IDS: Social Behavior & Self Development	44
IDS: Social Behavior & Self Development	12	AA Chemistry	37

Furthermore, data shows that STEM SLC students are more likely to obtain an award in less time than students from the comparison group. This is particularly relevant given the emphasis on time-to-degree through the Guided Pathways Initiative. Nearly 90% of cohort degree earners were awarded their first award within three years or less; among the comparison group, only 76% of award earners obtained their first award during this time period.

TIME TO AWARD: ALL AWARDS		
	Cohort Awards	Comparison Awards
One Year or Less	1.7%	2.1%
One to Two Years	49.8%	25.3%
Two to Three Years	37.3%	45.5%
Three to Four Years	10.5%	22.9%
Four to Five Years	0.7%	3.6%
Five to Six Years	0.0%	0.6%
	* One student fell into multiple groups for different degrees awarded.	* Forty-two students fell into multiple groups for different degrees awarded.

TRANSFER

Another useful indicator when considering student outcomes is the rate at which students transfer to a four-year institution. Like degree attainment, this indicator has traditionally lagged far behind the desired rate, both systemwide, and at Fullerton College. When looking at transfer rates for STEM SLC students though, we again see some evidence the program may be having a positive impact. Transfer rates across the earliest four cohorts (2016/17 through 2019/20) are slightly higher among STEM SLC students (36.2%) than students from the comparison group (23.3%). The difference between comparison and cohort groups are especially notable in the 2016-17 cohort (giving students five years to transfer), and in the 2018-19 cohort (where students had three years to transfer).



The decision about where to continue their education also differed. Students from the STEM SLC were more likely to choose a UC (43.8% compared to 19.5% in the comparison group), with UC Irvine, UC Riverside, UC Berkeley and UC Los Angeles all amongst the top five destinations for transfer (note that UCLA and UC Berkeley were tied for fifth place).

	Cohort Transfer Students	Comparison Transfer Earners
UC System	43.8%	19.5%
CSU System	36.0%	52.7%
Out of State Schools	5.6%	15.6%
CA Private Schools	14.6%	12.2%

RECOMMENDATIONS

Taking from the data presented above, the following recommendations have been created to ensure that the STEM SLC is moving forward in its efforts to support students on our campus.

Recruitment

Recruitment efforts should ensure that the demographics of students in the STEM SLC continue to mirror the wider Fullerton College population. Data collection accompanied with intentional marketing should be implemented, specifically to increase awareness of the support and services offered for students in historically underrepresented populations in STEM. The data highlighted a disparity in Black students participating in the STEM SLC versus the comparison group, which should be a focus of the program to eliminate that gap. Additionally, recruitment efforts should ensure that each new cohort is comprised of as close to 50% female students as possible.

Unit Accumulation

Student course taking patterns need to be consistently examined with special attention placed on what courses students are taking as they transition to their second, third, and fourth (if applicable) academic years at the college. Additionally, further analysis should be done on the first Math course attempted as well as desired transfer institution(s) (CSU vs UC) to better understand unit accumulation while completing necessary STEM course prerequisites/major preparation.

Persistence

Programmatic efforts need to consistently cultivate experiences inside and outside of the classroom setting so that students feel an increased sense of belonging to the program and wider campus community. These efforts should encompass academic, personal, and career-based interventions to continue to provide wraparound services to each student. Attention needs to be placed on those who move into their fourth year at the college to ensure that academic goals and timelines for completion are clearly defined. Action should be taken to increase the current practice of identifying students who do not persist from semester to semester and continue to offer counseling follow up that fosters the opportunity to return to active status in the program.