



Institute for Completion

in collaboration with

Institutional Research, Planning, and Effectiveness

## Citrus College STEM TRIO Student Support Services (SSS) Project

### Federal TRIO Programs

The Federal TRIO Programs (TRIO) are outreach and student support programs designed to identify and provide services for individuals from disadvantaged backgrounds. TRIO includes eight programs targeted to serve and assist low-income individuals, first-generation college students, and individuals with disabilities to progress through the academic pipeline from middle school to post-baccalaureate.

Authorized in 1968 by the Higher Education Act of 1965, the Student Support Services (SSS) program is funded to increase the postsecondary persistence and graduation rates of low-income students—defined as at or below 150 percent of the poverty level, first-generation college students, and students with disabilities. Participants in SSS projects must meet at least one of these eligibility criteria and exhibit academic need. A minimum of two-thirds of SSS participants must be both low-income and first-generation.

SSS projects are required to provide academic tutoring; guidance in selecting academic courses; scholarship information; assistance with completing financial aid applications and accessing financial aid programs; services to improve students' financial and economic literacy; and, assistance with transfer applications. Individual projects may also provide mentoring and grant aid and may engage participants in cultural events.<sup>1</sup>

The Government Performance and Results Act (GPRA) mandates annual reporting on the performance of each TRIO project. At the federal level, success across all SSS projects is measured using two outcomes: participant persistence and participant degree completion. At two-year institutions, federal analyses disaggregate completion rates in three categories—1) completion of an associate degree and transfer to a four-year institution; 2) completion of a certificate or an associate degree without transfer to a four-year

institution; and, 3) transfer to a four-year institution without completion of an associate degree. Completion rates for community college SSS participants has consistently remained between 39-41% annually.<sup>1</sup>

### Overview of Citrus College STEM TRIO Project

The Citrus College STEM TRIO SSS project was awarded in 2015 to serve 120 students annually.<sup>2</sup> Across the five-year funding period, the project enrolled 307 students, 76% of whom were both low-income and first-generation. Participants remained enrolled in the project until they completed a degree, transferred, or stopped out of college for personal reasons.

The project provided participants with all required services as well as other allowable high-touch services including mentoring. Each student completed a series of financial literacy modules and attended project-specific workshops that addressed non-cognitive factors and developed leadership skills.

Supporting eligible students to completion is the overarching goal of all SSS projects. Each prospective project must establish targets for four objectives (persistence, good academic standing, completion, and transfer) at rates above the average for eligible students prior to proposal submission. The Citrus College specific measurable objectives for 2015-2020 were 60% persistence; 65% good academic standing; 15% certificate or degree completion; and 8% completion and transfer. The project met and exceeded all objective targets, as outlined below.

### Five-Year Evaluation

The first Citrus College STEM SSS project concluded in August 2020. A study evaluating the effects of TRIO services on the outcomes of participants over the past five years was conducted by Institutional Research.

<sup>1</sup> U.S. Department of Education (2016). [Fast Facts Report for the Student Support Services Program \(PDF\) \(ed.gov\)](#)  
STEM TRIO SSS

<sup>2</sup> The STEM TRIO SSS project recently received an additional five-year award to continue the project through August 2025.

The study included students served by the project (n=261) between academic years 2015-16 through 2018-19. Although the TRIO project was funded for a total of five years, fifth year (2019-20) TRIO students were intentionally excluded in order to ensure students included in the study had at least one full year of services. A comparison group of low-income students majoring in STEM (n=283) was randomly selected.

Four student outcomes were measured in the study: cumulative credits earned, cumulative GPA, degree/ certificate attainment, and transfer. The dichotomous variable TRIO participation was the main predictor of interest in which students either belonged to the TRIO participation group or the non-participating group. Gender, ethnicity, and age were also included in the analyses as control variables.

Overall, the results show that participating in the TRIO project was associated with higher success for all the outcomes examined.

### Credits Earned

Eligible students participating in TRIO earned, on average, more credits than eligible non-participating students (69.9 vs. 53.8, respectively). About two-thirds of TRIO participants (65%) earned 60.1 or more credits while only 42% of eligible, non-participating students earned as many. Based on the results of a chi-square test, there is a statistically significant association between TRIO participation and cumulative credits earned,  $\chi^2(4) = 52.66, p < .001$ .

Table 1: Average credits earned, Summer 2015 - Spring 2020

	Average Credits Earned
TRIO Students	69.9
Non-TRIO Students	53.8

Table 2: Comparison of credits earned, Summer 2015 - Spring 2020

Cumulative Credits Earned	TRIO Students		Non-TRIO Students	
	Count	Percentage	Count	Percentage
0 - 30 credits	18	7%	85	30%
30.1 - 60 credits	74	28%	78	28%
60.1 - 90 credits	116	44%	74	26%
90.1-120 credits	45	17%	39	14%
120+ credits	8	3%	7	2%
<b>Total</b>	<b>261</b>	<b>100%</b>	<b>283</b>	<b>100%</b>

### GPA

After five years, a majority of TRIO students (89%) had a GPA of 2.5 or higher and an average GPA of 3.08. This is higher than the comparison group of students who had a mean GPA of 2.65. Only 64% of non-TRIO students had a cumulative GPA of 2.5 or higher. Based on the results of a chi-square test, there is a statistically significant association between TRIO participation and cumulative GPA,  $\chi^2(3) = 53.01, p < .001$ .

Table 3: Average cumulative GPA, Summer 2015 - Spring 2020

	Average Cumulative GPA
TRIO Students	3.08
Non-TRIO Students	2.65

Table 4: Comparison of cumulative GPA, Summer 2015 - Spring 2020

Cumulative GPA	TRIO Students		Non-TRIO Students	
	Count	Percentage	Count	Percentage
0 - 1.49	2	1%	34	12%
1.5 - 2.49	27	10%	69	24%
2.5 - 3.49	173	66%	129	46%
3.5 or higher	59	23%	51	18%
<b>Total</b>	<b>261</b>	<b>100%</b>	<b>283</b>	<b>100%</b>

### Degree/Certificate Attainment

Table 5, below, shows the percentage of TRIO and non-TRIO students that earned a degree or certificate between summer 2015 and spring 2020. Significantly more TRIO students earned an award compared to non-participating students (70% vs. 18%, respectively). Based on the results of a chi-square test, there is a statistically significant association between TRIO participation and degree/certificate attainment,  $\chi^2(1) = 150.19, p < .001$ .

Table 5: Degree and Certificate Attainment, Summer 2015 - Spring 2020

	Award Earners	Total	Percentage
TRIO Students	184	261	70%
Non-TRIO Students	52	283	18%

## Transfer

Table 6 shows the percentage of TRIO and non-TRIO students that transferred sometime between summer 2015 and summer 2020. More TRIO students transferred over the past five years compared to eligible students who did not participate in the project (73% vs. 31%, respectively). Based on the results of a chi-square test, there is a statistically significant association between TRIO participation and transfer,  $\chi^2(1) = 94.49, p < .001$ .

Table 6: Transfer, Summer 2015 – Summer 2020

	Transfers	Total	Percentage
TRIO Students	190	261	73%
Non-TRIO Students	88	283	31%

## Regression Analyses

Hierarchical binary logistic regression models were used to further test the contributions of TRIO participation, student demographics, credits earned, and GPA in predicting the likelihood of transferring and earning a degree or certificate. Similarly, hierarchical linear regression models were used to examine effect of credits earned and GPA on TRIO participation. The total sample used in the regression analyses were the 544 students included in the study (the 261 students that participated in TRIO and the 283 eligible, non-participating STEM students).

To examine the unique contribution of TRIO participation in the explanation of credits earned, GPA, degree attainment, and transfer, hierarchical regression analyses were performed. In step 1, the following independent variables were entered: gender, ethnicity, age, credits earned, and GPA. In step 2, group participation (TRIO vs. non-TRIO) was entered into the model.

## Credits Earned

Regression analyses showed that age and GPA significantly predicted the number of credits students earned with GPA making the largest contribution (e.g., the higher the student's GPA, the more credits they earned; credit accumulation decreased with an increase in age). TRIO participation made a significant contribution to the model and, after controlling for other variables, TRIO students earned 6.963 more credits than students who did not participate in the project.

## GPA

Analyses revealed that the independent variables (gender, ethnicity, age, and credits earned) accounted

for 29.8% of the variation. Including TRIO participation at step two explained an additional 3.4% of variation in GPA. The model showed that LatinX students' GPA was 0.305 less than the reference group (White students); GPA increased as age increased as well as with unit accumulation. After controlling for all other variables, the model shows that TRIO participants have a 0.308 higher GPA than students who did not participate in the project.

## Degree/Certificate Attainment

The first regression model, excluding TRIO participation, showed that increasing GPA and credits earned were associated with an increased likelihood of completing a degree or certificate. The model including TRIO participation accounted for 53% of the variability of degree attainment. The model showed that, holding all other variables constant, TRIO-served students are 11.4 times more likely to earn a degree or certificate as compared to their non-participating peers.

## Transfer

Consistent with degree/certificate attainment, increasing GPA and credits earned were associated with an increased likelihood of transferring to a four-year university. Adding TRIO participation to the model accounted for 38% of the variability. Holding all other variables constant, a TRIO-served STEM student was 4.5 times more likely to transfer to a university than an eligible, non-participating student.

## Disproportionate Impact Analyses

One additional area of interest was to explore the data for evidence of disproportionate impact based on ethnicity. Disproportionate impact occurs when a subgroup of students performs at a substantially lower rate than the other groups. Disproportionate impact analyses were carried out to determine whether there were significant ethnic group differences for TRIO vs non-TRIO students in the following outcomes: degree/certificate attainment and transfer. Another question of interest was whether participating in the TRIO project reduced or eliminated equity gaps among ethnic groups.

To calculate disproportionate impact, the percentage point gap (PPG) methodology was utilized. The PPG method compares each subgroup's outcome rate from the overall population's outcome rate. A subgroup is considered disproportionately impacted if subgroup's point gap index value is greater than the

threshold value or margin of error (E), which is adjusted based on the cohort size of the subgroup. Subgroups that are highlighted in red in the tables below are identified as being disproportionately impacted.

In order to compare mean differences of credits earned and GPA between ethnic groups in TRIO versus students not in TRIO, two-way ANOVA analyses were conducted. The main purpose of the two-way ANOVA analyses was to determine whether there was an interaction between ethnicity and TRIO participation on the dependent variables, credits earned and GPA. What follows is a summary of these results.

It is important to note that because there were no students in the control group whose ethnicity was unknown, the students in the TRIO program with an unknown ethnicity were excluded from the following analyses.

### Degree/Certificate Attainment

Overall, 18% of non-TRIO students earned a degree or certificate between summer 2015 and spring 2020. Latinx students earned a degree at the lowest rate (12%) and white students earned a degree at the highest rate (37%). Based on the PPG analysis, Latinx students who did not participate in TRIO were identified as disproportionately impacted as they earned degrees at a significantly lower rate than other non-TRIO student ethnic groups. However, when comparing subgroups within the TRIO project, the equity gap was eliminated for Latinx students. Degree attainment was much higher in general for TRIO students, with nearly 71% of TRIO students attaining a degree. The ethnic groups with the highest rate of degree attainment in the TRIO project were Latinx students (71%) and Black/African American students (78%).

### Transfer

In general, 31% of non-TRIO students transferred to a four-year university between summer 2015 and summer 2020. Within the non-TRIO ethnic subgroups, Latinx students had the lowest transfer rate (26%) while Black/African American students had the highest rate (67%). However, based on the PPG analysis disproportionate impact was not identified for any ethnic group. Overall, transfer rates were much higher for TRIO students, with about 73% of TRIO students transferring. The ethnic groups with the highest rate of degree attainment in the TRIO project were Black/African

American students (89%) and student of other ethnicity (100%). No disproportionate impact was identified for TRIO students.

### Credits Earned

In terms of differences between ethnic subgroups regarding credits earned, TRIO students of all ethnic subgroups earned more credits on average than non-TRIO students with the exception of White students and Black/African American students. The average credits earned for White TRIO students (65.7) was slightly lower than White non-TRIO students (66.1). Similarly, Black/African American students in the TRIO project had lower cumulative credits earned on average than their non-TRIO counterparts (61.8 vs. 79.7 respectively). However, due to the small sample size of Black/African American students in the study we should be cautious when interpreting the findings.

### GPA

Examining GPA by ethnicity shows that TRIO students of all ethnic subgroups earned more credits on average than non-TRIO students with the exception of Black/African American students. The average cumulative GPA for Black/African American students in the TRIO project was 3.08 which is lower than their non-TRIO counterparts whose average five-year cumulative GPA was 3.32. However, due to the small sample size of Black/African American students in the study we should be cautious when interpreting the findings.

### Conclusion<sup>3</sup>

In summary, the results presented in this report show that participating in the TRIO project was associated with higher success outcomes for all the outcomes examined. Similarly, the results of hierarchical regression analyses revealed that participating in TRIO was a significant predictor of cumulative credits earned, cumulative GPA, degree/certificate attainment, and transfer. Finally, the question of whether participating in the TRIO project reduced or eliminated equity gaps among ethnic groups was explored. The results of percentage point gap analyses showed that Latinx students who did not participate in TRIO were identified as disproportionately impacted as they earned degrees at a significantly lower rate than other non-TRIO student ethnic groups. However, when comparing subgroups within the TRIO project, the equity gap was eliminated for Latinx students.

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<sup>3</sup> For additional information contact Dr. Marianne Smith ([marsmith@citruscollege.edu](mailto:marsmith@citruscollege.edu))  
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