



## Associations between Summer Enrollment and Student Success

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The purpose of this report is to describe the association between summer session enrollment and student success (measured by persistence, graduation, GPA) among first-time, full-time (FTFT) cohorts at CSU.

### Executive Summary

There are academic and demographic differences by summer enrollment status. Summer enrollees have a slightly lower average index compared to students that do not enroll in a summer session (about .9 of an index point). Males, nonresidents, first generation students, Pell recipients and students of color are also underrepresented in the summer enrollee group. Although, Pell recipients have the lowest representation among students that enroll in the summer, which could suggest financial concerns hinder summer enrollment for low-income students. Please note that the bivariate analyses of the association between summer enrollment and student success do not account for these academic and demographic differences.

There does appear to be a positive association between summer enrollment and graduation as well as between summer enrollment and persistence. About 59% of all FTFT students enroll in at least one summer session and 66% of students that graduate in 6 years enroll in a summer session. This positive association also appears to vary by summer enrollment term. For instance, the association between summer enrollment and graduation is strongest for students that enroll during their second summer. On the other hand, there does not appear to be an association with efficiency towards degree and summer enrollment. The average number of terms between a student's first fall semester at CSU and their graduation term are greater among students that enroll in one or more summers compared to students that do not enroll in any summer terms.

The magnitude and variation between summer enrollment and graduation appears to be very similar for students of color and Pell recipients compared to the overall results. However, the positive associations are somewhat stronger for first generation students. There is nearly a 10 percentage point gap in the four year graduation rate among first generation students that enroll in their third summer term compared to first generation students that do not enroll in their third summer term. Summer enrollment could be a possible avenue for helping to close the graduation gaps for first generation students.

Summer enrollment is higher among students on academic probation. About 12.5% of students that enroll in their first summer term are on probation at the end of their first spring compared to the 10.5% of probation students that do not enroll in their first summer term. Summer enrollment has a positive association with moving to good academic standing for these students on probation. About 38% of the students on probation at the end of the first academic year move into good academic standing by the end of their second fall semester (compared to only 22% of the students on probation that do not enroll in during the first summer). These results suggest that summer enrollment is an important academic behavior for improving academic performance among students that struggle during their first year.

Summer enrollment is not associated with a higher subsequent fall GPA compared to the fall GPA among non-summer enrollees; however, the average term GPA in summer does tend to be higher compared to average term GPA in the fall or spring. Among students that are on probation at the end of their first spring semester, the students' summer term GPA is about one full grade point higher, on average, than their GPA during the spring semester. Students with lower GPA's tend to enroll in their first summer term and summer enrollment, on average, results in a higher term GPA for those students.



## Data

Summer session enrollment is measured by being enrolled at census or end of term in RI or online classes during a summer term. This definition is broader than the published summer term enrollment numbers (RI and census only) in order to account for the more varied opportunities for enrollment in summers.

The population included in this analysis are FTFT students from the FA08 through FA15 cohorts. Summer is considered at the end of the fall / spring academic year so a student’s first summer term is their third term of enrolment at CSU (first fall, first spring and then first summer).

## Student Success Outcomes

Student success is measured across the following variables:

- ✚ Persistence (2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> fall semesters)
- ✚ Graduation (4, 5, and 6 year)
- ✚ Time to Graduation
- ✚ Grade Point Averages
- ✚ Probation Rates

## Methodology

The longitudinal nature of summer enrollment makes the comparisons with student success complicated from a methodological standpoint. In order to control for the fact that summer enrollment requires persistence beyond semesters that have large attrition rates, the association between summer enrollment status and success is measured among students who persist to the point of having the opportunity to be enrolled in the specified summer. For instance, graduation and persistence rate differences by first summer enrollment status are measured only among students who persisted to the census of spring semester prior to the stated summer term to ensure that both groups had the opportunity to enroll in their first summer term. Similarly, differences by second summer enrollment status are assessed only among those that persist to their second spring semester. This is necessary to ensure that the positive associations between summer enrollment and graduation are not primarily explained the student persisting to a term past their cohort term, which is also strongly associated with success. Because of these methodological adjustments, rates presented in this paper do not match the typical cohort CSU rates. Additionally, rates in this bivariate analysis do not account for demographic or academic differences by summer enrollment status.

## Demographics

Table 1, below, displays the demographic attributes of students by summer enrollment status. Students that enroll in one or more summers are included in the summer enrollment group. The data is limited to FTFT students that persisted to their first spring semester from the FA08-FA12 cohorts (about 59% of all students enroll in at least one summer if they started at CSU at least four summers ago).

Table 1.

Demographics of FTFT Students from FA08-FA12<sup>1</sup> by Summer Enrollment Status

	Index (AVG)	Male (%)	Nonresident (%)	First Generation (%)	Pell Recipient (%)	Student of Color (%)
Summer Enrollment <sup>2</sup>	114.0	42.7%	20.0%	21.6%	15.8%	14.5%
Did not enroll in a Summer Term	114.9	45.6%	22.9%	25.7%	22.4%	17.8%

<sup>1</sup>Cohorts are limited to those that have the opportunity to enroll in at least four summer sessions (FA08-FA12) and to those that persisted to their first spring semester. Please note that the four summers due not include FA17 due to timing of analysis.

<sup>2</sup>Summer enrollment includes students who enrolled in at least one summer session



The average index score for students that complete a summer session is about .9 points lower compared to the average index among students that never enrolled during a summer term. Male students are underrepresented among the summer enrollment group along with nonresidents, first generation, Pell recipients and students of color. This underrepresentation is largest for Pell recipients with a 6.6 percentage point (PP) difference in the summer enrollment group. This PP gap is calculated by subtracting the Pell rate among the summer enrollment group (15.8%) from the non-summer enrollment group (22.4%). Please note that Pell recipient status and residency are measured during a student's cohort term even though this status can change each year.

## Student Success by Summer Enrollment

This section explores associations between summer enrollment and student success. Each student success outcome is addressed in its own section.

### Persistence

Table 2, below, displays the persistence rates by summer enrollment. In order to account for the time varying nature of summer enrollment, this analysis is limited to students that persist to the spring semester prior to the summer term that is before the persistence measure. For instance, 4<sup>th</sup> fall persistence is only measured among students who persisted to their third spring semester. This ensures that all of the students included in the fourth fall persistence measures had equal opportunity to enroll in their third summer. This adjustment is important because if prior spring persistence is not accounted for the difference in 4<sup>th</sup> fall persistence by 3<sup>rd</sup> summer enrollment status increases to 35 PP (compared to the 3 PP difference presented in the table below). This large difference in the gaps is largely because the majority of students who do not enroll in their third summer also do not persist to their third spring semester.

Table 2.

	Persistence Rates <sup>1</sup> by Summer Enrollment		
	2nd Fall Persistence	3rd Fall Persistence	4th Fall Persistence
Prior Summer Enrollment	96.4%	98.0%	98.8%
Did Not Enroll in Prior Summer	88.4%	91.7%	95.7%

<sup>1</sup>Analysis is limited to students that persisted to the spring semester prior to the summer before the persistence measure.

There is a slight positive association with summer enrollment and persistence. This association appears to be stronger in the first summer (prior to the 2<sup>nd</sup> fall) and decreases in magnitude for the second and third summers. For instance, There is an 8 PP gap by prior summer enrollment for 2<sup>nd</sup> fall persistence (96.4 minus 88.4), but a 6.3 PP gap for 3<sup>rd</sup> fall and a 3 PP gap for 4<sup>th</sup> fall.



### Graduation

Table 3 displays the percentage of FTFT students that participate in any summer session and the percentage of 4, 5, and 6 year graduates.

Table 3.

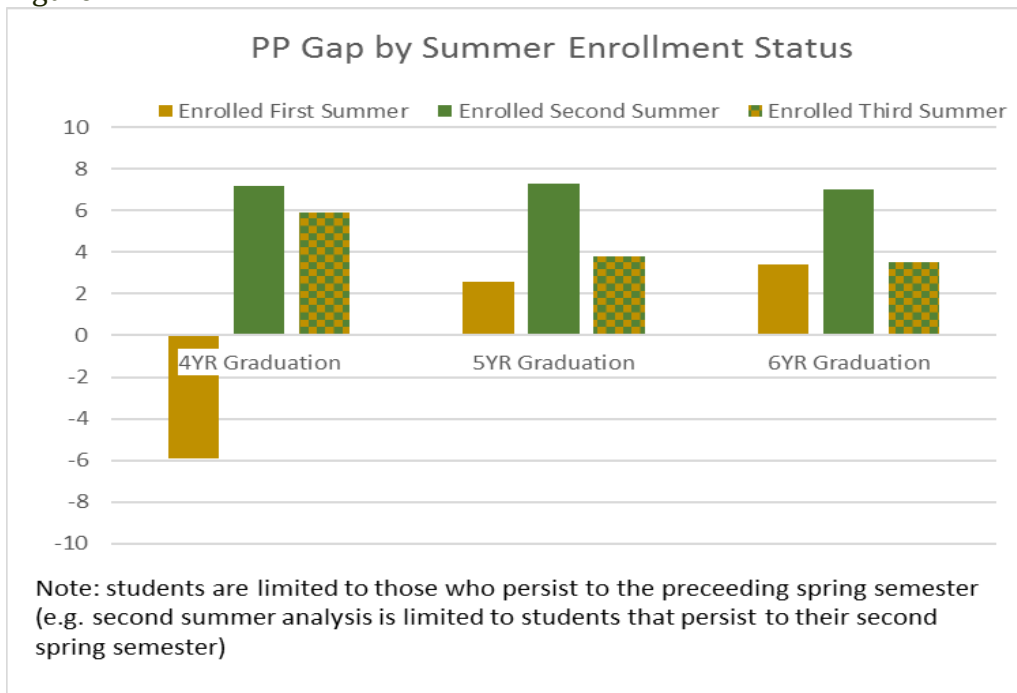
Percentage of Students that Enroll in One or More Summer Sessions	
FTFT Students from FA08-FA12 <sup>1</sup>	59.3%
4 YR Graduates	62.6%
5 YR Graduates	65.0%
6 YR Graduates	66.0%

<sup>1</sup>Cohorts are limited to those that have the opportunity to enroll in at least four summer sessions based on their first term and persist to their second fall semester.

Summer enrollment appears to have a slightly positive association with student success. For instance, among students who graduate within 4 years, about 63% of them enrolled in a summer session, which is about 3.4 PP higher than all students (62.6 minus 59.3). Note that the rate of summer enrollment increases as the graduation year increases, which is partially due to students having more opportunities to enroll in the summer. For instance, about 66% of students that graduate in 6 years participated in at least one summer session; however, only 64.9% of these 6 year graduates participated in a summer session that was before their fifth summer.

Figure 1 displays the gaps in graduation rates by specified summer of enrollment in order to assess if the timing of summer enrollment is differentially associated with student success. The PP gap is calculated by subtracting the non-summer enrollment rate from the summer enrollment rate. A negative gap indicates that the summer enrolled group has a lower graduation rate compared to the non-summer group and a positive gap indicates that the summer enrolled group has a higher graduation rate. The rates that these PP gaps are calculated with can be found in the Appendix.

Figure 1.





The association between summer enrollment and graduation does appear to vary over time. The association is negative for first summer enrollment on four year graduation but is positive for first summer on five and six year graduation. The association is positive for 4, 5, and 6 year graduation rates for second and third summer enrollment; however, the magnitude of the positive difference is much larger for second summer compared to first or third summer. For instance, the 6-year PP gap by summer enrollment is 3.5 for the first and third summer enrollment but the PP gap is 7 for second summer (87.8% minus 80.8%). Enrollment in the second summer term (as students transition into Junior year) could be an avenue for increasing overall graduation rates at CSU.

The PP differences in graduation rates by summer enrollment for first generation students, Pell recipients, and students of color are shown in figures A.1 through A.3 in the appendix. The time varying positive association between summer enrollment and graduation appears to follow a similar pattern and magnitude for students of color as well as Pell recipients. The association appears to be strongest for third summer enrollment among first generation students. There is nearly a 10 PP difference in the 4 year graduation rate by third summer term enrollment for first generation students (compared to about 6 PP in figure 1). This indicates that summer enrollment does not have a differentially negative association for demographic groups that have historically lower graduation rates (i.e. increasing summer enrollment among these groups shouldn't have unintended negative consequences on their student success outcomes) and could possibly have a stronger association for first generation students.

## Time to Graduation

Time to graduation is a measure of efficiency towards degree among students that graduate. The average terms to graduation represent the average count of terms (including summer terms and regardless of enrollment) from a student's cohort term (first term at CSU) to their graduation term. This count includes summer and is regardless of enrollment, i.e. gap terms are still included in the count. Overall at CSU, the average time to graduation for 2015-16 graduates is 12.1 (reference [link](#)), which is just over four academic years. Table 4 displays the average terms to graduation by the number of summers enrolled for FTFT students that earn their undergraduate degree from the FA08-FA10 FTFT cohorts.

Table 4.

Average Time to Graduation<sup>1</sup> by Number of Summers Enrolled

Number of Summers Enrolled	Headcount	AVG Terms <sup>2</sup> to Graduation
None	6199	11.87
One Summer	3726	12.07
Two Summers	2067	12.53
Three Summers	733	13.29
Four or More Summers	155	14.87

<sup>1</sup>Limited to graduates from the FTFT FA08-FA10 cohorts

<sup>2</sup>Terms to graduation is a count of the terms (including summer and regardless of enrollment) between the graduation term and the cohort term

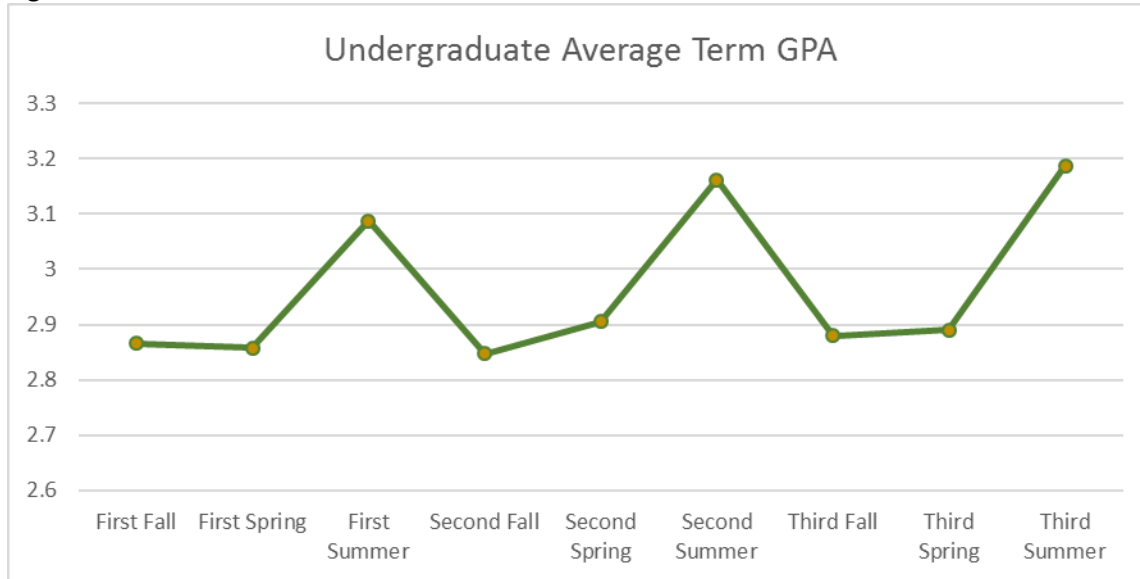
The average time to graduation has a positive association with the number of summers enrolled. For instance, graduates that never enroll in a summer term take just under four academic years to earn their degree (11.87 terms); however, students that enroll in only one summer session take just over four academic years to earn their degree (12.07 terms) and students that enroll in three summers take about four and a half years to earn their degree (13.29 terms). In other words, enrolling in a summer term does not appear to be associated with slightly longer times to graduation.



### Grade Point Averages

Figure 2, below, displays the average term GPA for students first through third fall, spring, and summer terms.

Figure 2.



On average, term GPA increases each subsequent term, e.g. third fall has a slightly higher average compared to first fall. Additionally, summer term GPA is substantially higher than fall or spring term GPA. For instance, the average first summer term GPA is 3.07 grade points, but the average first spring and first fall GPA is about 2.9 grade points. This indicates that summer enrollment should have a positive association for increasing individuals GPA.

Tables 4, 5 and 6 display the end of fall term and cumulative undergraduate GPA by prior summer term enrollment. This data can be used to assess if prior summer enrollment is associated with a higher cumulative or term GPA in the subsequent fall semester.

Table 4.

Second Fall End of Term GPA by First Summer Enrollment

	Cumulative GPA	Term GPA
First Summer Enrollment	2.92	2.75
Did Not Enroll in First Summer	2.97	2.89

Table 5.

Third Fall End of Term GPA by Second Summer Enrollment

	Cumulative GPA	Term GPA
Second Summer Enrollment	3.05	2.96
Did Not Enroll in Second Summer	3.05	3.00



Table 6.

Fourth Fall End of Term GPA by Third Summer Enrollment

	Cumulative GPA	Term GPA
Third Summer Enrollment	3.04	3.03
Did Not Enroll in Third Summer	3.11	3.13

Term and cumulative GPA is consistently lower in a specified fall semester for students enrolled in the prior summer compared to those that did not enroll in a prior summer. The gap in term GPA is largest in the second fall and smallest in the third fall. Please note, this analysis does not control for the GPA prior to summer enrollment. The lower GPA among summer enrolls could be explained by students having lower GPA's prior to the summer term.

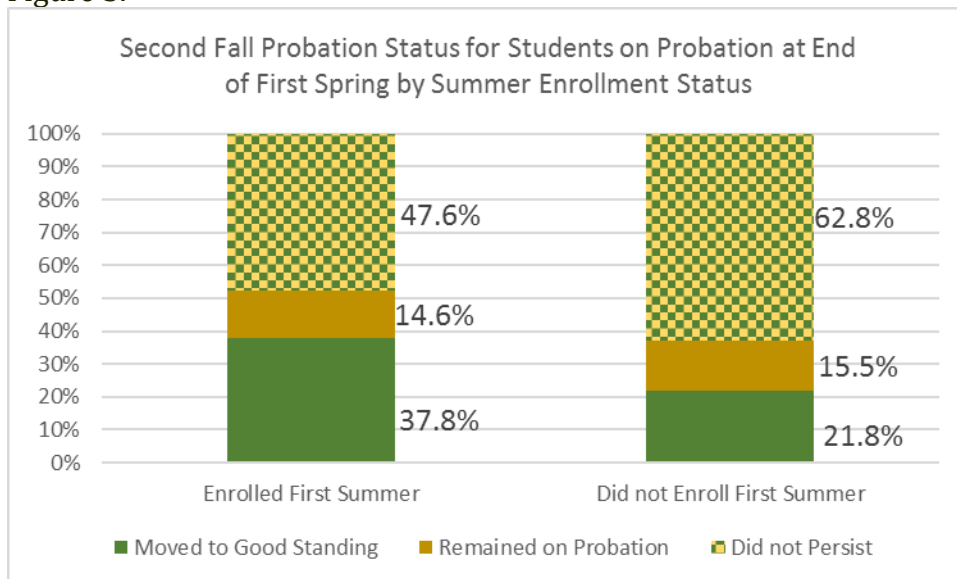
### Probation Rates

This section explores how summer session enrollment is associated with moving from academic probation to good academic standing.

Students on academic probation at the end of their first spring semester enroll in first summer term at higher rates. About 12.5% of students that enroll in summer session during their first summer term are on academic probation at the end of their first spring semester in comparison to a 10.5% probation rate among the students that do not enroll in their first summer term. This association is not true for second and third summer sessions. For instance, about 2.2% of students enrolled in the second summer session were on probation at the end of their second spring semester and about 3.5% of students that do not enroll in the second summer session were on probation at the end of their second spring.

Figure 3 displays the second fall academic success patterns for students on probation at the end of their spring semester by first summer enrollment status.

Figure 3.







The proportion of students that moved from probation at the end of the first spring semester to good academic standing by the end of the second fall semester is much higher for students that attended summer session during their first summer compared to the first spring students that did not enroll in their first summer (37.8% compared to 21.8%). Among the students that are on probation at the end of their first spring semester, about 13% enroll in their first summer term. The 37.8% (as shown in figure 3) of summer enrollees that move to good academic standing is about 21 students per cohort compared to the 83 non-summer enrollee students per cohort (21.8% of the non-summer enrollees) that move to good academic standing. This indicates that the proportion of first-year probation students that enroll in summer needs to increase in order for this positive association to have a meaningful impact on CSU's overall percent of students that move from first-year probation to good academic standing after the second fall semester.

Additionally, the attrition rate for the end of second fall semester is much lower for first summer enrollees (47.6%) compared to students that did not enroll in the first summer (62.8%). These statistics indicate a positive association between second fall academic success and first summer enrollment for students that are on academic probation at the end of their first academic year. Among students on probation at the end of the first spring semester, the average term GPA for the summer increases about one full grade point compared to their first spring GPA. Individuals in good academic standing at the end of the first year also have a higher term GPA in the summer compared to the spring but this difference is much smaller in magnitude (about .1 of a grade point). This also indicates that summer enrollment might be one avenue for helping students move to good academic standing if they are on probation at the end of their first academic year.

## Conclusions

Summer enrollment appears to be a positive academic behavior in terms of persistence and graduation, especially for students that struggle during the first academic year. Students that enroll in one or more summer session persist and graduate at higher rates compared to students that do not enroll during the summer. Summer enrollment is not associated with a higher GPA, but summer enrollment does appear to help students move from probation to good academic standing and improve the individual's term and cumulative GPA. Additionally, summer enrollment does not appear to decrease the time to degree completion.

Diverse populations (Pell recipients in particular) are underrepresented among summer enrollees. This could indicate that finances make summer enrollment a more difficult academic choice for low-income populations. However, there is some correlational evidence that summer enrollment has a differentially positive association for first generation students' likelihood of graduating. This suggests the importance of removing barriers of summer enrollment for groups that have been historically underserved at CSU.





# Appendix

## Graduation Rates by Specified Summer

Tables A.1 through A.3 display the graduation rates by specified summer enrollment in order to assess if the timing of summer enrollment is differentially associated with student success. These are the rates that are used to calculate the PP differences displayed in figure 1.

Table A.1

Graduation Rates by First Summer Enrollment <sup>1</sup>			
	4YR Graduation Rate	5 YR Graduation	6 YR Graduation
First Summer Enrollment	44.5%	68.9%	73.2%
Did Not Enroll in First Summer	50.4%	66.3%	69.9%

<sup>1</sup>Limited to students that persisted to their first spring semester

Table A.2

Graduation Rates by Second Summer Enrollment <sup>1</sup>			
	4YR Graduation Rate	5 YR Graduation	6 YR Graduation
Second Summer Enrollment	57.6%	83.7%	87.8%
Did Not Enroll in Second Summer	50.4%	76.5%	80.8%

<sup>1</sup>Limited to students that persisted to their second spring semester

Table A.3

Graduation Rates by Third Summer Enrollment <sup>1</sup>			
	4YR Graduation Rate	5 YR Graduation	6 YR Graduation
Third Summer Enrollment	60.4%	87.6%	92.0%
Did Not Enroll in Third Summer	54.5%	83.8%	88.5%

<sup>1</sup>Limited to students that persisted to their third spring semester



### Graduation Rate Gaps by Summer Enrollment Status by Demographic Group

Figure A.1

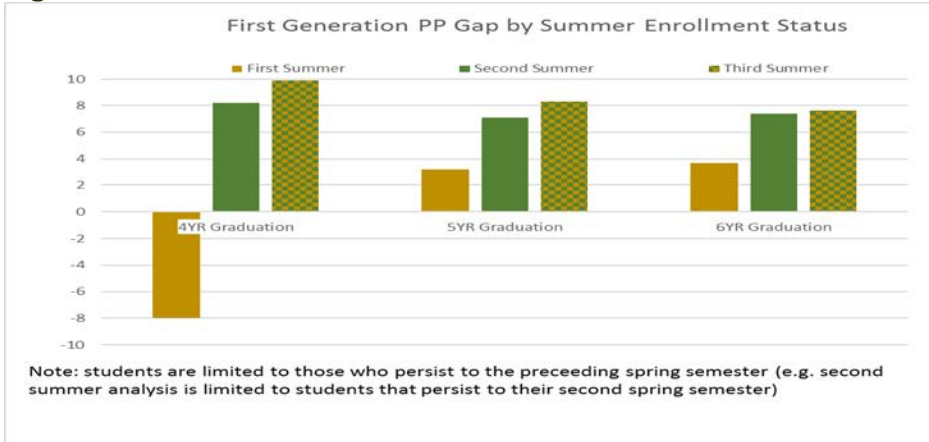


Figure A.2

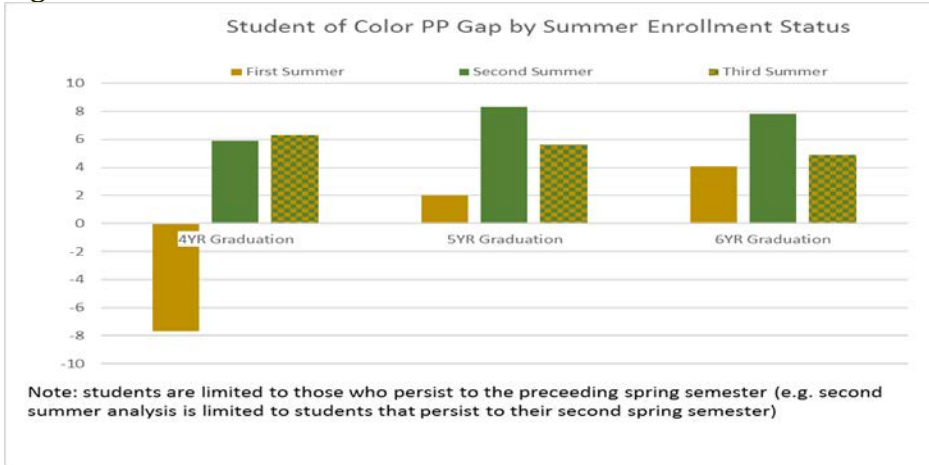


Figure A.3

