

DATE: 2/14/2019

TO: AB 705 Implementation Team

FROM: Doreen Finkelstein, Research Analyst

RE: Math enrollment under AB 705 for Fall 2018

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**Introduction:**

The passage of Assembly Bill (AB) 705 removed barriers for the placement of students into gateway, transfer-level math (e.g., Math 10, Math 48A), with the goal of increasing the number of students who enroll in, and successfully complete, these courses within one year. In compliance with AB 705, as of Fall 2018, all Foothill College students are eligible to enroll directly into these courses. Depending upon a student's high school achievement (GPA and course grades), students may be required to take a corequisite, Math 248A, along with Math 48A.

While students are no longer being placed into math courses below transfer-level (e.g., Math 105), they may still elect to take these courses.

This study looked at 1) enrollment into Math 10 and Math 48A compared to the previous year (Fall 2017); 2) differences between students who enrolled in Math 10 and Math 48A vs. those who enrolled in below-transfer-level math coursework; and 3) placement and enrollment patterns for the Math 48A corequisite, Math 248A.

**Results Overview:**

- Enrollment patterns were in line with the goals of AB 705. Enrollment in Math 10 increased by 277 students over the previous year, for a gain of 45%, while enrollment in Math 48A increased by 100 students, for a gain of 38%. There were significant gains in the proportion of Latinx students enrolled in Math 10 (+9%) and Math 48A (+13%).
- Students who enrolled in below-transfer-level math coursework (Math 105, Math 180, and Math 217) were more likely to be African-American (+4%), Latinx (+5%), or Pacific Islander (+3%) than were students who enrolled in Math 10 or Math 48A. They were also more likely to be female (+3%). Future research into these enrollment patterns can help determine whether these student groups are more likely to enroll in below-transfer-level coursework due to different educational goals — in which case the enrollment patterns are appropriate — or for some other reason (e.g., unawareness of their eligibility for higher-level math or lack of confidence in their ability to succeed in higher-level math).
- Students taking the corequisite with Math 48A were more likely to be Latinx (+19%) and African-American (+3%) than were students taking Math 48A without the corequisite. They were also

more likely to be male (+6%). Awareness of these trends may help inform future pedagogy and curriculum in the Math 48A corequisite.

- Out of the 364 students who enrolled in Math 48A, 53 (15%) underplaced themselves by taking the corequisite when they were not required to take it. These students were more likely to be White (+9%) and female (+8%). A survey of Math 48A students suggests that the primary reasons for self-underplacement were 1) a seeming lack of awareness of higher-level math eligibility, 2) an interest in additional academic support to pass the class, and 3) a desire to take the class with a specific instructor who was only teaching Math 48A with Math 248A. Ongoing research is required to monitor the underplacement trends as more data are needed before any conclusions or implications can be identified.

**Results Detail:**

**Enrollment in Math 10**

Math 10 enrollment increased by 277 students (45%) in Fall 2018 as compared to Fall 2017. If the increase in Math 10 enrollment was proportionately equal for all student groups, we would expect to see no change in the proportions across the two years. As shown in Table 1, there was a greater increase in Math 10 enrollment among Latinx students than for other groups, especially Asian students. There was an increase in the relative proportion of Latinx students among the Math 10 student population, going from 30% in Fall 2017 to 39% in Fall 2018 (+9%) and a decrease in the relative proportion of Asian students, going from 30% in Fall 2017 to 22% in Fall 2018 (-8%). The relative proportion of female students also declined slightly (-3%).

**Table 1: Math 10 Enrollment by Student Group**

Student Group	Fall 2017		Fall 2018		F18-F17 Difference
	Head Count	%	Head Count	%	
<b>By Ethnicity</b>					
African American	23	4%	54	6%	+2%
Asian	185	30%	196	22%	-8%
Filipinx	41	7%	63	7%	0%
Latinx	185	30%	345	39%	+9%
Native American	2	0%	1	0%	0%
Pacific Islander	9	1%	5	1%	0%
White	162	26%	219	24%	-2%
Decline to State	12	2%	13	1%	-1%
<b>By Gender</b>					
Female	369	60%	507	57%	-3%
Male	249	40%	381	42%	+2%
Decline to State	1	0%	8	1%	+1%
<b>Total</b>	<b>619</b>	<b>100%</b>	<b>896</b>	<b>100%</b>	

**Enrollment in Math 48A**

Math 48A enrollment increased by 100 students (38%) in Fall 2018 as compared to Fall 2017. If the increase in Math 48A enrollment was proportionately equal for all student groups, we would expect

to see no change in the proportions across the two years. As shown in Table 2, there was a greater increase in Math 48A enrollment among Latinx students than for other groups, especially Asian students. There was an increase in the relative proportion of Latinx students among the Math 48A student population, going from 28% in Fall 2017 to 41% in Fall 2018 (+13%) and a decrease in the relative proportion of Asian students, going from 33% in Fall 2017 to 20% in Fall 2018 (-13%). The relative proportion of female students also declined slightly (-3%).

**Table 2: Math 48A Enrollment by Student Group**

Student Group	Fall 2017		Fall 2018		Difference
	Head Count	%	Head Count	%	
<b>By Ethnicity</b>					
African American	5	2%	9	2%	0%
Asian	88	33%	72	20%	-13%
Filipinx	14	5%	19	5%	0%
Latinx	74	28%	151	41%	+13%
Native American	0	0%	0	0%	0%
Pacific Islander	7	3%	8	2%	-1%
White	72	27%	97	27%	0%
Decline to State	4	2%	8	2%	0%
<b>By Gender</b>					
Female	112	42%	141	39%	-3%
Male	150	57%	219	60%	+3%
Decline to State	2	1%	4	1%	0%
<b>Total</b>	<b>264</b>	<b>100%</b>	<b>364</b>	<b>100%</b>	

Note: Percents do not always sum to 100 due to rounding.

***Enrollment in Math 10 and Math 48A vs. Below-Transfer-Level Math Coursework***

Table 3 shows Fall 2018 enrollment in Math 10 and Math 48A vs. enrollment in below-transfer-level math coursework (Math 105, Math 180, and Math 217), disaggregated by student ethnicity and gender. While there were over four times as many enrollments in Math 10 and Math 48A as in the lower-level courses (1260 vs. 305), students who chose to enroll in the below-transfer-level courses were more likely to be African-American (+4%), Latinx (+5%), or Pacific Islander (+3%). They were also more likely to be female (+3%).

**Table 3: Fall 2018 Enrollment in  
Math 10 and Math 48A vs. Below-Transfer-Level Math by Student Group**

Student Group	Below-Transfer-Level <sup>1</sup>		Math 10 and Math 48A		Difference
	Head Count	%	Head Count	%	
<b>By Ethnicity</b>					
African American	26	9%	63	5%	+4%
Asian	38	12%	268	21%	-9%
Filipinx	22	7%	82	7%	0%
Latinx	135	44%	496	39%	+5%
Native American	0	0%	1	0%	0%
Pacific Islander	12	4%	13	1%	+3%
White	71	23%	316	25%	-2%
Decline to State	1	0%	21	2%	-2%
<b>By Gender</b>					
Female	164	54%	648	51%	+3%
Male	136	45%	600	48%	-3%
Decline to State	5	2%	12	1%	+1%
<b>Total</b>	<b>305</b>	<b>100%</b>	<b>1260</b>	<b>100%</b>	

<sup>1</sup>Three below-transfer-level courses were offered in Fall 2018: Math 105, Math 180, and Math 217.

Note: Counts are duplicated for students enrolled in more than one course. Percents do not always sum to 100 due to rounding.

***Enrollment in Math 48A Corequisite***

Depending on a student's high school GPA and coursework, they may be required to enroll in a corequisite course, Math 248A, when they enroll in Math 48A. In Fall 2018, five sections of Math 48A were paired with the corequisite, while five were stand-alone Math 48A sections.

Table 4 shows Fall 2018 enrollment in the Math 48A sections paired with the corequisite vs. the stand-alone sections, disaggregated by student ethnicity and gender. Students taking the corequisite were more likely to be Latinx (+19%) and African-American (+3%). They were also more likely to be male (+6%).

**Table 4: Fall 2018 Enrollment in Math 48A  
with and without Corequisite by Student Group**

Student Group	With Corequisite		Stand-Alone		Difference
	Head Count	%	Head Count	%	
<b>By Ethnicity</b>					
African American	7	4%	2	1%	+3%
Asian	23	13%	49	27%	-14%
Filipinx	10	6%	9	5%	+1%
Latinx	92	51%	59	32%	+19%
Native American	0	0%	0	0%	0%
Pacific Islander	3	2%	5	3%	-1%
White	42	23%	55	30%	-7%
Decline to State	4	2%	4	2%	0%
<b>By Gender</b>					
Female	66	36%	75	41%	-5%
Male	114	63%	105	57%	+6%
Decline to State	1	1%	3	2%	-1%
<b>Total</b>	<b>181</b>	<b>100%</b>	<b>183</b>	<b>100%</b>	

Note: Percents do not always sum to 100 due to rounding.

These students may not have been aware of their higher-level math placement, or they may have enrolled in a section paired with the corequisite because of a preference for the instructor or the day and time the section was offered, or else they may have been forced into a corequisite section because other sections were full. A final possibility is that these students were not confident in their math ability, and deliberately chose to underplace themselves in the math sequence. In order to help investigate why these students were underplaced, a survey of Fall 2018 Math 48A students was conducted in December 2018; among the questions asked of students taking the Math 48A corequisite was why they were taking it. Of the 53 students who were underplaced, 19 (36%) responded to the survey. Table 6 shows the reasons they gave for taking the corequisite.

Around half of the survey respondents (10 students, 53%) said they were unaware of their eligibility for a higher-level placement. The next most common reasons for enrolling in the corequisite were a desire for the increased support (7 students, 37%) and a desire to take the course with the instructor who was teaching the corequisite (5 students, 26%).

**Table 5: Fall 2018 Underplacement into Math 48A with Corequisite  
by Student Group**

<b>Student Group</b>	<b>Count of Underplaced Students</b>	<b>Percent of Underplaced Students</b>	<b>Count of Students in Math 48A (all)</b>	<b>Percent of Students in Math 48A (all)</b>	<b>Difference</b>
<b>By Ethnicity</b>					
African American	1	2%	9	2%	0%
Asian	8	15%	72	20%	-5%
Filipinx	3	6%	19	5%	+1%
Latinx	20	38%	151	41%	-3%
Native American	0	0%	0	0%	0%
Pacific Islander	1	2%	8	2%	0%
White	19	36%	97	27%	+9%
Decline to State	1	2%	8	2%	0%
<b>By Gender</b>					
Female	25	47%	141	39%	+8%
Male	28	53%	219	60%	-7%
Decline to State	0	0%	4	1%	-1%
<b>Total</b>	<b>53</b>	<b>100%</b>	<b>364</b>	<b>100%</b>	

Note: Percents do not always sum to 100 due to rounding.

**Table 6: Fall 2018 Underplacement into Math 48A with Corequisite:  
Reasons Given for Taking the Corequisite (Survey Results)**

<b>Reason</b>	<b>Count</b>	<b>%</b>
Believed was ineligible to enroll in Math 48A without the corequisite	10	53%
Wanted the extra support from the corequisite	7	37%
Wanted to take the course with the corequisite's instructor	5	26%
Corequisite section was the best fit for the student's schedule	2	11%
Enrolled in STEM Core	2	11%
Unaware it was possible to enroll in Math 48A without the corequisite	1	5%

Note: Students could give more than one reason, so percents do not sum to 100.

### **Methodology**

Course enrollments were obtained from the ODS table Registration\_Analysis, while student ethnicity and gender were obtained from the ODS table SS\_Student\_Term\_Attributes. Eligibility to enroll into Math 48A without the corequisite was determined through a combination of their math placement (obtained from the ODS table Test) and whether they had previously passed Math 105, Math 108, or a transfer-level math course (obtained from the ODS table Registration\_Analysis).