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Research • Planning • Professional Development  
for California Community Colleges

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# Transition in Math from High School to Community College Before and After AB 705

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# Introduction

With the implementation of AB 705 in fall 2019, California Community Colleges began to transition to a majority of students' first English and math enrollment starting at transfer level. Research<sup>1</sup> has shown that with the vast increase in access to transfer-level courses, the one-year completion rate of a transfer-level course (i.e., throughput) also increased, exceeding all rates exhibited in the past when students largely began in basic skills coursework. However, as throughput increased for all student groups,<sup>2</sup> course success rates decreased at varying rates across colleges, causing some concern about student capacity to successfully complete transfer-level math courses.

An expected outcome of increased access to transfer-level courses as a result of AB 705 was greater alignment of high school and community college pathways, with students taking the next step beyond their high school learning, rather than repeating courses they already completed in high school. However, with implementation varying across colleges throughout the state, it is unclear to what extent colleges are placing students into math courses that build on their high school learning rather than repeat it.

This brief compares high school to community college transitions in California in fall 2016, before AB 705<sup>3</sup> came into effect in 2018 and post-implementation in fall 2019. Data included in this analysis were obtained from the Cal-PASS<sup>4</sup> data system using Multiple Measures Assessment Project (MMAP) data file methodology.<sup>5</sup> Data were limited to students with four years of high school data. To determine the highest level of high school math successfully completed by these students, the analysis included a student's last high school math course completed with a grade of C- or better.

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<sup>1</sup>[https://rpgroup.org/Portals/0/Documents/Projects/MultipleMeasures/AB705\\_Workshops/AccessEnrollmentSuccess\\_RPGroup\\_Final2020-1.pdf?ver=2021-04-28-082835-143](https://rpgroup.org/Portals/0/Documents/Projects/MultipleMeasures/AB705_Workshops/AccessEnrollmentSuccess_RPGroup_Final2020-1.pdf?ver=2021-04-28-082835-143)

<sup>2</sup>[https://rpgroup.org/Portals/0/Documents/Projects/MultipleMeasures/AB705\\_Workshops/Enrollment%20and%20Success%20in%20Transfer-Level English and Math for Special Populations\\_July2021.pdf?ver=2021-08-04-114819-053](https://rpgroup.org/Portals/0/Documents/Projects/MultipleMeasures/AB705_Workshops/Enrollment%20and%20Success%20in%20Transfer-Level%20English%20and%20Math%20for%20Special%20Populations_July2021.pdf?ver=2021-08-04-114819-053)

<sup>3</sup><https://assessment.cccco.edu/ab-705-implementation>

<sup>4</sup><https://www.calpassplus.org/Home>

<sup>5</sup>[https://rpgroup.org/Portals/0/Documents/Projects/MultipleMeasures/AB705\\_Workshops/AccessEnrollmentSuccess\\_RPGroup\\_Final2020-1.pdf?ver=2021-04-28-082835-143](https://rpgroup.org/Portals/0/Documents/Projects/MultipleMeasures/AB705_Workshops/AccessEnrollmentSuccess_RPGroup_Final2020-1.pdf?ver=2021-04-28-082835-143)

## Key Findings

- Prior to the implementation of AB 705 (fall 2016):
  - About 78% of students repeated one or more math courses at the community college after already successfully completing it in high school with a C or better.
  - Minoritized<sup>6</sup> students were about 20% more likely than Asian and White students to repeat coursework in community college lower than that which they had already successfully completed in high school.
- After the implementation of AB 705 (fall 2019):
  - 44% of students repeated one or more math courses at the community college that they had already successfully completed in high school with a C or better.
  - Over three quarters of minoritized students transitioned to transfer-level community college math (Figure 3).
- Continued challenges include:
  - Almost half of students are still repeating previously completed high school coursework.
  - The rate of students who completed an advanced high school math course (above Algebra 2) and repeated the same course at the community college was over twice as high in 2019 (21%) compared with 2016 (9%).
  - Transfer-level course success rates remain far above the one-year transfer-level completion rates for students who started in remedial courses (i.e., throughput rate) prior to the implementation of the law (e.g., ~20% throughput from one level below compared with 47% average success rate in fall 2019). However, transfer-level course success rates declined by 10 percentage points from 2016 to 2019, with even students repeating higher level courses (such as precalculus) showing declines.

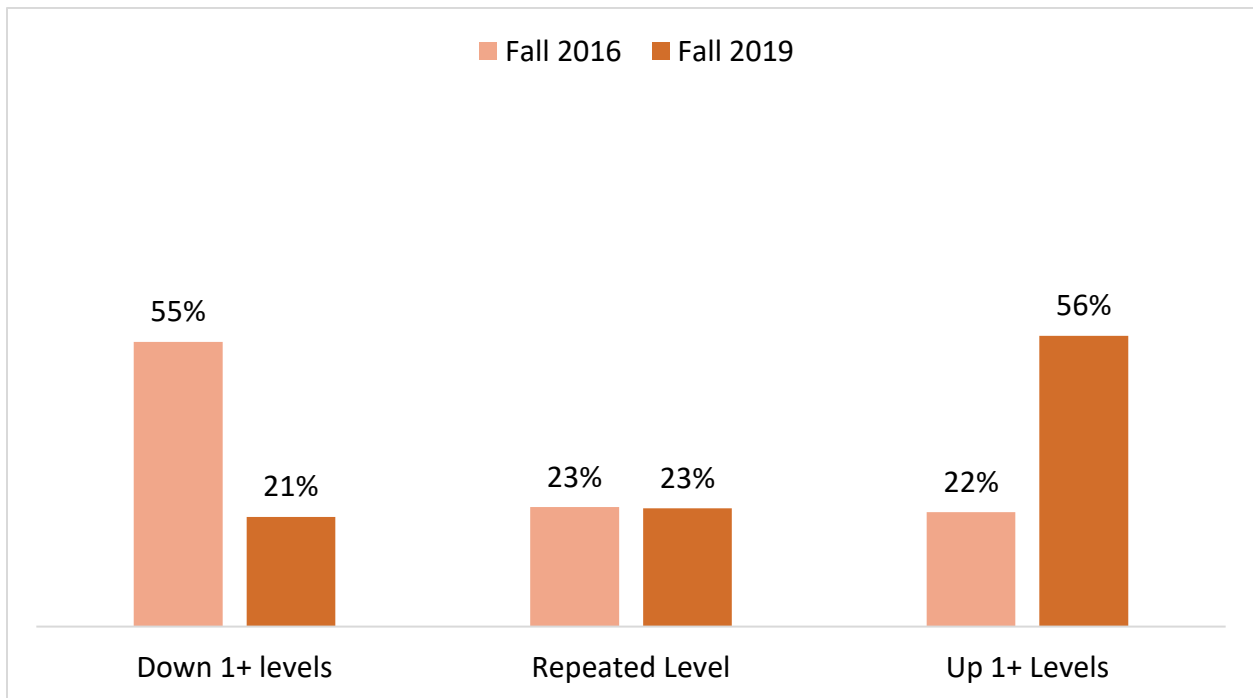
As displayed in Figure 1, the rate at which community college students were placed lower than the highest level course they completed in high school was cut by more than half from 55% in 2016 to 21% in 2019. The rate at which students repeated the same course remained the same at 23%, while the rate at which students were placed in the next course or a higher level course than they completed in high school more than doubled from 22% to 56%, respectively.

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<sup>6</sup> Minoritized ethnicities include Black/African American, Filipina/o/x, Hispanic/Latina/o/x, Native American/Indigenous, and Pacific Islander.

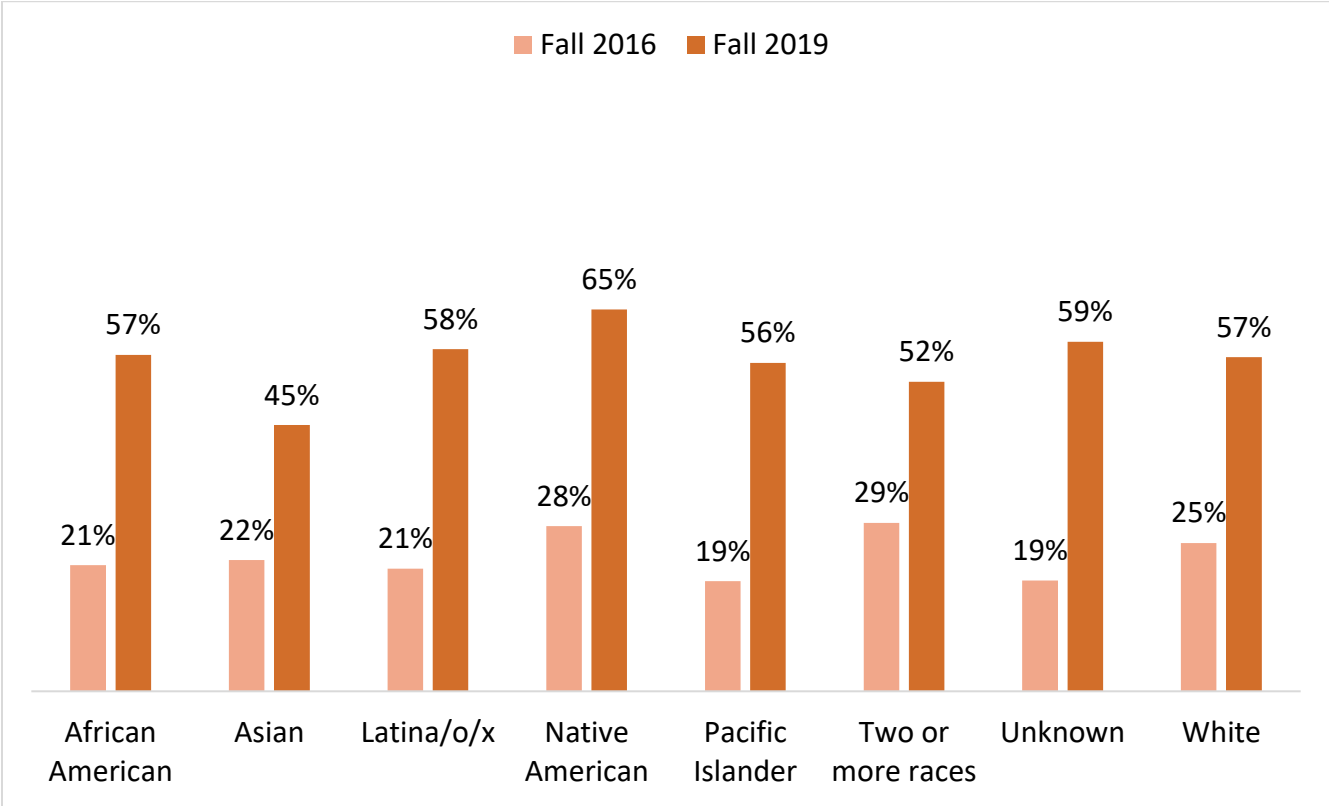
However, that means 44% of students continue to repeat a course they successfully completed in high school (with a C or better) or to take a lower level course than they successfully completed in high school, slowing their trajectory from high school to college along their math pathway. If we exclude high school calculus to community college calculus transitions, 37% of students repeat one or more levels of high school math. Given that the volume of students in the “calculus to calculus” transition category has approximately doubled in this timeframe of fall 2016 to fall 2019 (from 684 to 1,165), additional research may be warranted to examine progression through the calculus sequence in more detail.

**Figure 1.** Math Transition from High School to Community College by Level of First Attempted Course at a Community College: Fall 2016 Compared with Fall 2019



As displayed in Figure 2, the rate at which all ethnic groups transitioned to a course one or more levels above the highest course they completed in high school more than doubled for all groups; it was two and a half times greater for African American and Latina/o/x students and almost three times higher for Pacific Islander students. For fall 2019, Asian students were the ethnicity with the lowest percentage transitioning up one or more levels. Asian students historically have been much more likely to complete advanced high school math. For example, in fall 2016, Asian students were twice as likely as White students and almost five times as likely as Latina/o/x students to have completed calculus in high school. The apparently low upward transition rate for Asian students in fall 2019 appears to be caused by a “ceiling effect” or approaching the maximum possible value with respect to progression at the community college. As noted for Figure 1, a more detailed analysis of the progression of advanced high school math completers could be performed.

**Figure 2.** Percentage of Students Transitioning up One or More Levels from High School to Community College Math by Ethnicity: Fall 2016 Compared with Fall 2019



**Figure 3.** Percentage of Students Transitioning to Transfer-Level Community College Math by Ethnicity: Fall 2016 Compared with Fall 2019

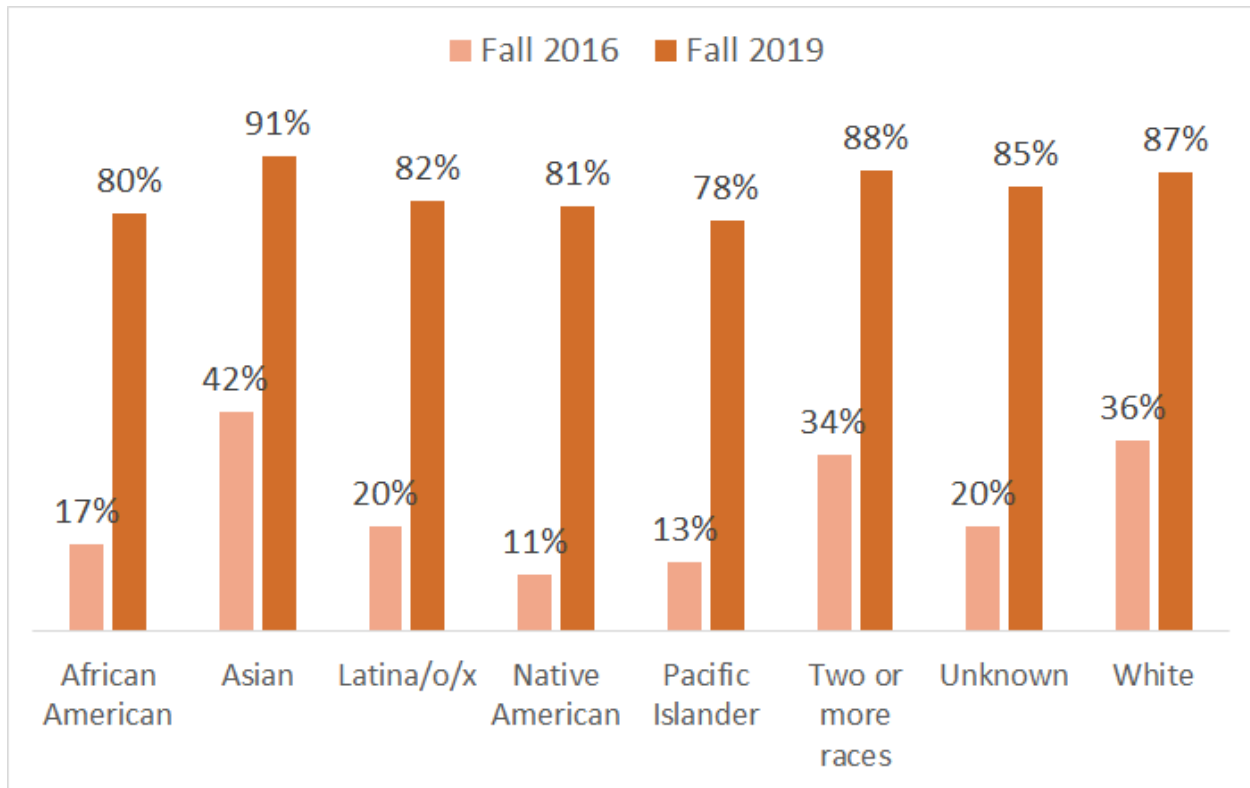


Figure 3 (above) displays the percentage of students who enrolled in a transfer-level math course at the community college. The rates at which all student groups accessed transfer-level math increased substantially from 2016 to 2019, though African American, Latina/o/x, Native American, and Pacific Islander students' transition to transfer-level courses remained lower than those of Asian and White students. Even so, rates increased for all ethnicities: over fourfold for Latina/o/x students, over fivefold for African American students, sixfold for Pacific Islander students, sevenfold for Native American students, and twofold for Asian and White students.

**Table 1.** Transition from High School to Community College with Row Percentages

	CC Arith	CC PreAlg	CC El Alg	CC Geom	CC Int Alg	CC TL SLAM	CC PreCalc	CC Calc+	Total N
<b>Fall 2016</b>									
HS Arith	12%	29%	34%	*	21%	2%	1%	*	1,674
HS PreAlg	17%	40%	18%	*	23%	*	*	*	109
HS Alg 1	11%	32%	32%	*	22%	2%	1%	*	1,905
HS Geom	8%	23%	32%	*	31%	3%	2%	0%	4,296
HS Alg 2	4%	13%	24%	0.10%	40%	11%	8%	1%	8,044
HS Stats	2%	10%	17%	*	34%	19%	13%	5%	3,697
HS PreCalc	2%	6%	12%	*	37%	18%	19%	6%	4,745
HS Calc+	1%	1%	3%	*	20%	16%	20%	39%	1,776
F2016 Total Row %	5%	14%	22%	0.05%	33%	11%	10%	5%	100%
F2016 Total N	1,261	3,800	5,749	13	8,661	2,937	2,563	1,262	26,246
<b>Fall 2019</b>									
HS Arith	*	2%	4%	*	28%	50%	16%	1%	1,521
HS PreAlg	*	3%	*	*	45%	44%	5%	*	149
HS Alg 1	0.40%	2%	4%	*	32%	47%	14%	1%	2,048
HS Geom	0.20%	1%	3%	*	24%	53%	18%	1%	4,203
HS Alg 2	0.10%	0.40%	1%	*	13%	55%	28%	2%	9,528
HS Stats	*	0.10%	0.50%	*	9%	56%	27%	7%	6,335
HS PreCalc	*	0.20%	0.30%	*	7%	47%	33%	13%	5,843
HS Calc+	*	*	*	*	2%	31%	15%	51%	2,273
Fall 2019 Total Row %	0.10%	1%	1%	*	14%	51%	25%	8%	100%
F2019 Total N	32	171	382	*	4,430	16,248	7,965	2,670	31,900

Notes: \* indicates cell had fewer than 10 students. Darker shaded cells represent higher values within each high school course level. Cells with an orange border indicate repeating already completed HS courses. See Appendix A for abbreviation definitions.

Table 1 above displays students by their highest math course completed in high school and the percentage who were placed into the different levels of math at the community college for fall 2016 and fall 2019. As displayed, a student who completed high school arithmetic in fall 2016 was placed in community college elementary algebra at the highest rate (34%) but post-AB 705, these students were placed into transfer-level SLAM (50%) at the highest rate. A plurality of students completed Algebra 2 or the equivalent in high school in both years. In fall 2016, about one-third of those students repeated Algebra 2 at the community college, while almost another third retook lower level courses. In contrast, in fall 2019, a strong majority (85%) of these students transitioned to transfer-level classes.

**Table 2.** Success (Grade of C or Better) in First Community College Math Attempt after High School Transition

	CC Arith	CC PreAlg	CC EI Alg	CC Geom	CC Int Alg	CC TL SLAM	CC PreCalc	CC Calc+	Total N
<b>Fall 2016</b>									
HS Arith	52%	46%	39%	*	37%	51%	43%	*	1,674
HS PreAlg	50%	41%	35%	*	36%	*	*	*	109
HS Alg 1	48%	43%	40%	*	29%	42%	40%	*	1,905
HS Geom	50%	55%	46%	*	41%	39%	34%	59%	4,296
HS Alg 2	64%	66%	58%	*	55%	54%	46%	39%	8,044
HS Stats	64%	65%	65%	*	65%	72%	69%	68%	3,697
HS PreCalc	66%	72%	69%	*	66%	68%	59%	58%	4,745
HS Calc+	50%	86%	79%	*	76%	81%	69%	74%	1,776
F2016 Total Row %	55%	57%	53%	54%	55%	64%	57%	67%	57%
F2016 Total N	1,261	3,800	5,749	13	8,661	2,937	2,563	1,262	26,246
<b>Fall 2019</b>									
HS Arith	*	27%	35%	*	27%	42%	31%	29%	1,521
HS PreAlg	*	40%	*	*	18%	15%	38%	*	149
HS Alg 1	50%	56%	33%	*	28%	33%	23%	41%	2,048
HS Geom	50%	49%	47%	*	30%	36%	23%	35%	4,203
HS Alg 2	57%	65%	49%	*	41%	48%	34%	32%	9,528
HS Stats	*	78%	55%	*	40%	59%	45%	65%	6,335
HS PreCalc	*	71%	60%	*	57%	65%	54%	44%	5,843
HS Calc+	*	*	*	*	69%	80%	66%	70%	2,273
Fall 2019 Total Row %	53.00%	53%	44%	*	36%	52%	41%	58%	47%
F2019 Total N	32	171	382	*	4,430	16,248	7,965	2,670	31,900

Notes: \* indicates cell had fewer than 10 students Darker shaded cells represent higher values within each high school course level. Cells with an orange border indicate repeating already completed HS courses. See Appendix A for abbreviation definitions.

As displayed in Table 2 overall success rates declined from 57% to 47%. Focusing on high school Algebra 2 completers, in fall 2016, those who repeated that class at community college had a 55% success rate, which was nearly identical to the success rate of their peers who attempted statistics at the community college (54%). In fall 2019, the success rates for those repeating Algebra 2 was seven percentage points lower than for those progressing to statistics (48% and 41%, respectively). In both years, the highest success rates were generally seen among students repeating a course more than one level below the highest math course completed in high school and those who completed math courses at a higher level than Algebra 2 in high school.



## Conclusions and Future Research

This analysis focuses on fall 2016 and fall 2019 to examine the impact of AB 705 implementation, but voluntary reform efforts were underway prior to 2017, including acceleration, enhanced multiple measures placement, supplemental instruction, embedded tutoring, and equity pedagogy. Having multiple policy and practice changes occurring simultaneously makes it challenging to separate the influence of the AB 705 from voluntary reform efforts. What remains clear is that these reforms taken as a whole have resulted in a majority of students beginning at transfer level, while challenges remain with many students still repeating high school coursework—especially those at the advanced math level. The AB 705 policy focused on use of high school data and maximizing the completion of transfer level work *of any level*. The expectation that advanced high school math students pick up their math sequence at community college where they left off in high school was left unaddressed. Articulation of high school and community college coursework is up to local districts to address, and a focus on such efforts could increase students' completion rates with reduced time to completion in fewer units.

One consequence of AB 705 is that the average community college student is making a decision between a Statistics and Liberal Arts Math (SLAM) and Business, Science, Technology, Engineering Math (BSTEM) math pathway in their first enrollment. Subsequent research could examine advanced high school math students in more detail as they transition to community college, including the degree to which students continue on a BSTEM pathway or switch from BSTEM to SLAM (or vice versa) and how this relates to students' selection of a college major and their subsequent progression towards completion. Results could inform high school to college articulation and Guided Pathways implementations around counseling, program development, and information for students.

## Appendix A. Math Course Abbreviations

Abbreviation	Definition
Arith	Arithmetic
PreAlg	Prealgebra
Alg 1	Algebra 1 and equivalent (e.g., Integrated Math 1)
EIAlg	Elementary Algebra and equivalent (e.g., two levels below transfer)
Geom	Geometry and equivalent (e.g., Integrated Math 2)
Alg 2	Algebra 2 and equivalent (e.g., Integrated Math 3)
IntAlg	Intermediate Algebra and equivalent (e.g., one level below transfer)
PreCalc	Precalculus
Calc+	Calculus 1 or higher
AP Stats	Advanced Placement Statistics
TL	Transfer Level
BSTEM	Business, Science, Technology, Engineering, Math
SLAM	Statistics and Liberal Arts Math

# The Research and Planning Group for California Community Colleges

The RP Group strengthens the ability of California community colleges to discover and undertake high-quality research, planning, and assessments that improve evidence-based decision-making, institutional effectiveness, and success for all students.

## Project Team

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