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What Happens When Colleges Broaden Access to Transfer-Level Courses?

Evidence from California's Community Colleges

SUMMARY

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Technical appendices to this report are available on the PPIC website.

The majority of California community college students never complete their education. For many students, the largest obstacle to success has been remedial—or developmental—education. Until recently, the vast majority of entering students were placed in developmental courses, and relatively few went on to complete transfer-level courses in English and math. Several colleges responded to this longstanding challenge by experimenting with placement and curricular reforms.

In 2017, new legislation (AB 705) was enacted to broaden the scope and accelerate the pace of change. This landmark reform, which fundamentally changes placement and remedial support system-wide, has the potential to improve long-term student trajectories. As of fall 2019, this law requires all community colleges to use high school records to place students in English and math courses, opening the door to transfer-level courses for the majority of entering students.

This reform has moved the community college system into uncharted territory. However, a group of colleges that have already significantly broadened access to transfer-level courses can shed light on what we might expect. Our research shows that these colleges saw dramatic gains in student success, with large increases in the number of first-time students completing transfer-level courses in English and math. Gains were experienced by all students, including Latinos and African Americans. Colleges that offered students support courses at the same time they took transfer-level courses, a practice known as co-requisite remediation, had especially strong results. This means that thousands of students who in the past would have started college in remedial courses are now bypassing those courses and succeeding in transfer-level courses. Specifically, we find:

- System-wide, we saw especially large increases in the percentage of first-time students starting directly in transfer-level English (68% in 2018, compared to 38% in 2015). Increases in access were driven by a group of 39 colleges. Gains in math were also substantial (43% in 2018, compared to 26% in 2015), but only 16 colleges significantly broadened access.
- Increases in access translated into increases in student success. For example, the share of first-time English students completing college composition in one term increased 30 percentage points in the group of 39 colleges that significantly broadened access, from 24 percent in 2015 to 54 percent in 2018. Similarly, the share of first-time math students completing transfer-level math in a term increased by 18 percentage points.
- Success improved among all students, including Latinos and African Americans. However, equity gaps remain.

- Students who enrolled in transfer-level courses with co-requisite support had much higher completion rates than those who started in traditional developmental education courses.

Moving forward, data collection and sharing, research, and evaluation will be more important than ever. It will be crucial to identify any groups of students who are not successful under the new model; evaluate whether and how the new policies are affecting racial/ethnic achievement gaps; determine which kinds of concurrent support work best; and identify any unintended consequences of the law. Colleges should be willing to make additional changes based on this evidence. System-wide, the Chancellor's Office should play a role in supporting colleges and ensuring transparency and accountability.

Introduction

California's community colleges have a strong record of providing access to higher education—they enroll more students than any other college system in the country, including large shares from groups that have been historically underrepresented (California Community Colleges Chancellor's Office 2019). But improving student outcomes has long been a challenge: fewer than half of students (48%) earn a degree or certificate or transfer to a four-year institution within six years.[1]

Improving completion and transfer rates is crucial for the state. The California community colleges are the state's primary provider of career education, and, through transfers to four-year colleges, essential to the production of bachelor's degrees in our state. Without significant increases in the number of associate degrees awarded and in the number of transfers to four-year institutions, the state will not be able to meet future workforce needs (Johnson, Bohn, and Cuellar Mejia 2017; Johnson, Cuellar Mejia, and Bohn 2018).

The community college system is implementing a broad range of reforms designed to address its low completion rates. These reforms—which include changes to assessment and placement policies, the adoption of guided pathways, a revised funding formula, the establishment of the California College Promise and the creation of a fully online college—focus on improving the student experience from initial enrollment to graduation and beyond and together help colleges work toward achieving the Chancellor's Vision for Success goals.

Changes to assessment and placement policies, which determine student readiness for college-level coursework, addresses one of the biggest obstacles along the pathway toward completion or transfer. For a long time, the vast majority of community college students started in developmental education, spending time and money on courses that did not count toward a degree or transfer. Research is beginning to show that successfully completing pathway-appropriate college-level math and English in the first academic year could improve long-term outcomes (Jenkins and Bailey 2017).

Colleges in California and across the country have traditionally relied on standardized placement tests to determine which math and English courses students should take (Rodriguez et al. 2016; Rutschow and Mayer 2018). Extensive research showed that these tests were not strong predictors of student performance in college-level courses and that they placed many students in developmental education who could have been successful in college-level courses (Belfield and Crosta 2012; Fulton 2012; Hodara and Cox 2016; Scott-Clayton 2012; Scott-Clayton et al. 2014). Moreover, research has also showed that the length of developmental education sequences significantly reduced the chances that students would ever complete a transfer-level course (Bailey et al. 2010; Cuellar Mejia et al. 2016).

This research spurred reform efforts in two main areas. One set of reforms aimed to change the structure and curricula of developmental education sequences, guided by the principle that redesigned shorter pathways that are better aligned to the transfer-level course lead to improved student outcomes (Bahr 2019, Burdman et al. 2018; Cuellar Mejia et al. 2018; Hayward and Willett 2014; Rodriguez et al. 2017). Colleges in California started to implement these type of reforms—which included compression, integration, one-semester accelerated developmental English courses, statistics pathways, and contextualization—as early as 2006. The California Acceleration Project and the Carnegie Math Pathways have been instrumental in supporting colleges with the adoption of math and English acceleration strategies.[2] Our prior research found that these accelerated approaches were indeed leading to higher throughput rates than

[1] California Community Colleges' 2018 Student Success Scorecard.

[2] The California Acceleration Project (CAP), founded in 2010, is a faculty-led professional development network that supports the state's 114 community colleges in implementing reforms that substantially increase student completion of transferable, college-level English and math requirements, a critical milestone on the path to degrees and transfer. These include using high school grades in placement, replacing traditional remedial courses with co-requisite models, tailoring math remediation to students' program of study, and teaching with high-challenge, high-support pedagogy in English, math, and ESL.

traditional developmental sequences (Rodriguez et al. 2017; Cuellar Mejia et al. 2018). However, these reforms were not implemented across the system and fewer than half of the students who enrolled in these accelerated courses completed a transfer-level course in the same subject.

A second set of reforms aimed to make placement policies more consistent and accurate through the use of multiple measures assessment. In California, the Multiple Measures Assessment Project (MMAP) was instrumental in convincing colleges about the need for multiple measures assessment based on high school records.[3] Funding from the Basic Skills Student Outcomes and Transformation Grant (BSSOT) was another motivating factor. However, for the most part, these college-level reform efforts were pilots that lacked the breadth and depth to substantially improve access to and timely completion of transfer-level English and math courses. AB 705 emerged as a way to broaden the scope and accelerate the pace of change.

AB 705 (Education Code §78213) was enacted on January 1, 2018, with a full implementation deadline of fall 2019. It is not the first piece of legislation intended to improve developmental education, but it is arguably the most important.[4] Under AB 705, community colleges are required to maximize the likelihood that students will enter and complete transfer-level coursework in English and mathematics/quantitative reasoning within a one-year timeframe.[5] Colleges are also required to use high school information for placement decisions, as well as guided self-placement if a student's high school performance data is not available or usable with reasonable effort. In response to AB 705, colleges are not only changing the way they assess and place students in English and math courses but also reforming their delivery of developmental education for those who need extra support. They are doing so primarily by shifting from prerequisite developmental education to concurrent support models. In concurrent models, students receive extra help while they take the transfer-level course. This extra help can take different forms, including pairing a transfer-level course with a co-requisite support course, extending instructional time through additional lecture or lab hours, or requiring students to participate in academic support services such as writing labs, tutoring centers, or supplemental instruction (Daugherty et al. 2018).

A year ago PPIC released a report identifying colleges that expanded access to transfer-level courses in English and math, and presenting descriptive evidence on what those increases meant in terms of throughput rates (Rodriguez et al. 2018). This new report, which includes data through fall 2018, examines whether our earlier findings hold as access to transfer-level courses broadened further and more colleges implemented co-requisite supports. Specifically, it describes how access to transfer-level courses has increased in the years leading up to the deadline for full implementation of AB 705; explores if and how those changes in access have translated to increases in the share of students successfully completing those courses (overall and across racial/ethnic groups); and looks at how colleges have modified their developmental education offerings. Because there have been marked differences in implementation of placement reforms in math and English, this report tackles these subjects in separate sections. In addition, this report provides new descriptive evidence on the gains in throughput of co-requisite students versus students in traditional developmental sequences, and on how well co-requisite courses prepare students for subsequent courses.

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[3] The original Multiple Measures Assessment Project (MMAP) was a collaborative effort led by the RP Group and Educational Results Partnerships' Cal-PASS Plus system to develop, pilot, and assess implementation of a statewide placement tool using multiple measures. The MMAP engaged with more than 90 pilot colleges statewide. The project has now shifted to support AB 705 implementation.

[4] Recent efforts include SB 81 (enacted in 2015), which established the Basic Skills and Student Outcomes Transformation program, one-time incentive grants for colleges to adopt or expand the use of evidence-based models for basic skills assessment, placement, instruction, and student support over a multiyear period.

[5] AB 705 also addresses the need to create ESL pathways that allow students to complete transfer-level English within three years. The bill would also authorize the board of governors to establish regulations that ensure that, for students who seek a goal other than transfer, and who are in certificate or degree programs with specific requirements that are not met with transfer-level coursework, a community college maximizes the probability that a student will enter and complete the required college-level coursework in English and mathematics within a one-year timeframe.

Our analyses use student-level longitudinal data from the California Community Colleges Chancellor's Office (CCCCO). In addition, we conducted a landscape scan of college catalogs, schedules, and websites, to identify co-requisite support offerings. To inform our quantitative findings, we conducted semi-structured interviews with faculty, division deans, and researchers at 19 of the colleges that have significantly broadened access to transfer-level courses and/or offered co-requisite support at scale. Through these interviews, we gained insights about the type of placement and curricular reforms that were implemented, the complexities of implementing these reforms, the biggest challenges faced, and key components of successful outcomes.[6] The report concludes with some important considerations for community colleges and state officials as we move into the AB 705 era.

[6] In spring 2019, we conducted phone interviews with 19 community colleges: 16 implementing English reforms, 5 implementing math reforms, 2 of these colleges implemented reforms in both disciplines. In all, we spoke to 24 individuals, including 2 group interviews, with faculty or department chairs (15 English and 3 math), division deans (2 English and 2 math), and researchers (2 speaking to both math and English). Colleges were selected if they fit our definition of significant increases in access (see the text box) and/or they offered concurrent support models that enrolled at least 100 students. For more details, see Technical Appendix C.

Glossary of Terms

Course success rates: Share of the students enrolled in a course who completed it with a grade of C or better.

Developmental English courses: We restrict the universe of developmental English courses to those that are required in order to take college composition. Once we identified the introductory college composition course in each college, we looked for it in the course description section of the college catalog and proceeded backward through the prerequisites to the lowest level of remedial coursework that was part of each college's pathway to college composition.

Developmental math courses: We trace all courses that lead up to intermediate algebra, which until recently was a prerequisite for every transfer-level math course.

First-time English students: We define cohorts of students based on the term in which they took their first credit English course—college composition or any developmental education course identified in our scan—anywhere in the system. They do not need to be first-time students in that term.

First-time math students: We define cohorts of students based on the term in which they took their first credit math course—a transferable course or any developmental education/intermediate algebra course identified in our scan—anywhere in the system. They do not need to be first-time students in that term.

Intermediate algebra: This is a college-level course that meets the competency requirement for an associate degree. However, it is not a transferable course to UC or CSU. This means that a student whose first math course was intermediate algebra is counted as starting below transfer-level and therefore is not counted in our throughput rates. This is why we use the term transfer-level math as opposed to college-level math.

One-term throughput rate: The proportion of a cohort of students who complete a college composition or transfer-level math course in their first term. We restrict our sample to degree/transfer-seeking students (using the variable student goal from the success file in the COMIS data).

One-year throughput rate: The proportion of a cohort of students who complete a college composition or transfer-level math course within two primary semesters or three primary quarters of entering their first course in the sequence. We restrict our sample to degree/transfer-seeking students (using the variable student goal from the success file in the COMIS data).

Transfer-level English: We identify the introductory college composition course in each college using the C-ID ENGL 100 descriptor. This course fulfills English composition general education requirements for an associate degree as well as for transfer to a four-year institution. Note that in our research this definition excludes any transfer-level English courses that do not meet college composition requirements (e.g., British literature, poetry, etc.).

Transfer-level math: Considering that colleges' math requirements vary according to student programs of study, any math course (TOP CODE 1701 and 1702) that is flagged as transferable in the MIS data by the variable CB05 is included in our study (e.g., introductory statistics, trigonometry, college algebra, pre-calculus, applied calculus courses, among other courses). In addition to transferable statistics courses offered by math departments, we include statistics and probability courses offered by the Psychology (2001), Business (0501, 0505, 0506), Sociology (2208), and Economics (2204) departments, among others.

Please refer to Technical Appendix C for more information our data and methods, and to Technical Appendix D for information about the caveats and limitations of this research.

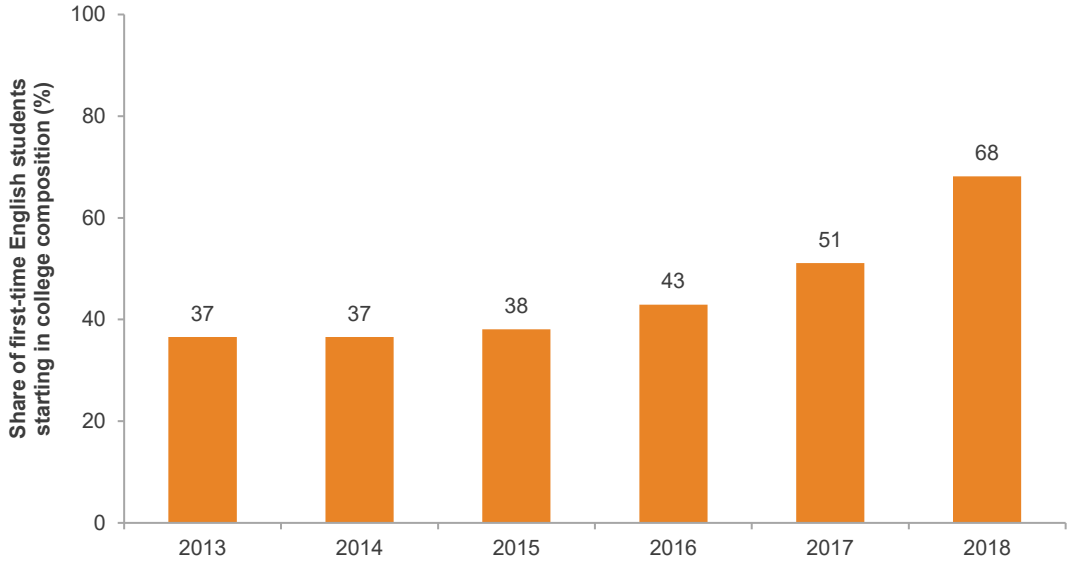
English

Access to College Composition Has Expanded Since 2015

In the four years prior to full implementation of AB 705, the share of first-time English students enrolling directly into college composition increased from 38 percent in 2015 to 68 percent in 2018. This meant that about 47,000 additional students were able to bypass remediation. As Figure 1 displays, prior to 2016 we see little change in direct access to college composition courses. Consistent with the availability of BSSOT grants and the increased reach of MMAP, access increased steadily since 2015 as more colleges got on board with the importance of engaging in placement reform.[7] But it was in 2018, when AB 705 was enacted, that the pace of change accelerated. It is expected that this share will grow further in fall 2019, when all colleges in the system are required to be in full compliance with the law.

FIGURE 1

Access to college composition has increased substantially in the past few years



SOURCE: Authors' calculations based on CCCCO MIS data.

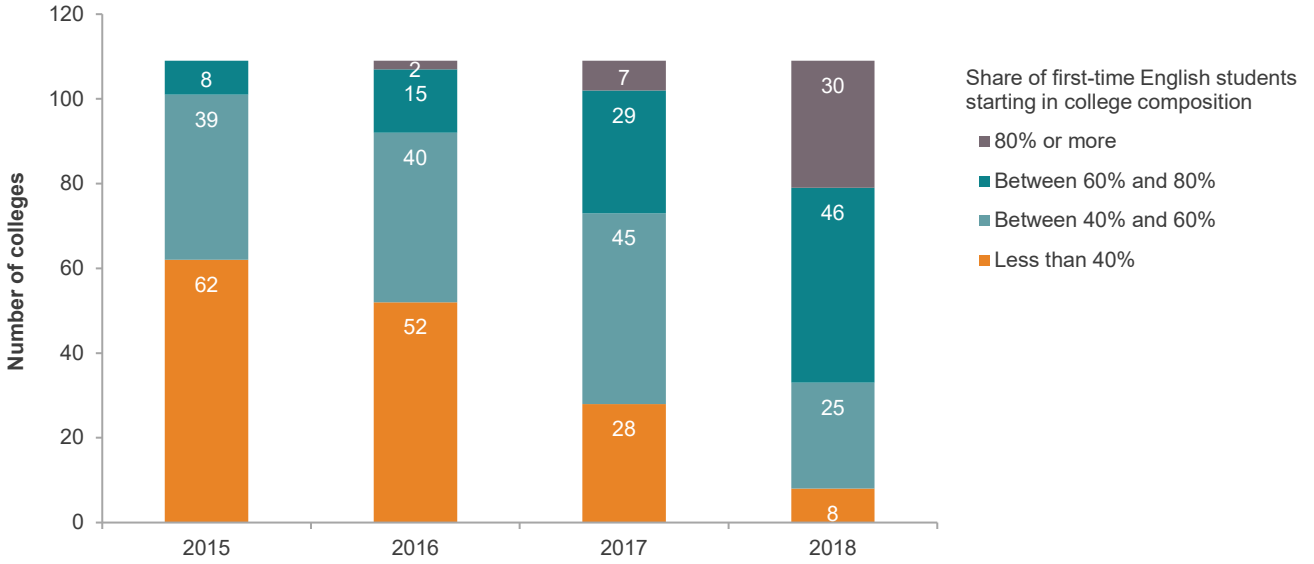
NOTES: Fall of each year. Based on 109 colleges. The number of first-time English students remained stable between 2015 and 2018 at around 155,000. See Technical Appendix C for more details.

[7] We heard about the role of these repeatedly during our interviews with colleges for last year's report and again during this round of interviews.

However, system-wide figures mask wide variation across the system. The distribution of colleges by direct access to college composition looks very different in 2018 than it did in 2015. In 2018, 30 colleges enrolled at least 80 percent of their first-time English students directly in college composition. Back in 2015, that was not the case in any college in the system. More dramatic is the fact that in 62 colleges, fewer than 40 percent of first-time students started in a transfer-level course in 2015, compared to only eight colleges in 2018 (Figure 2).

FIGURE 2

Access to college composition has expanded unevenly across the system



SOURCE: Authors' calculations based on CCCO MIS data.

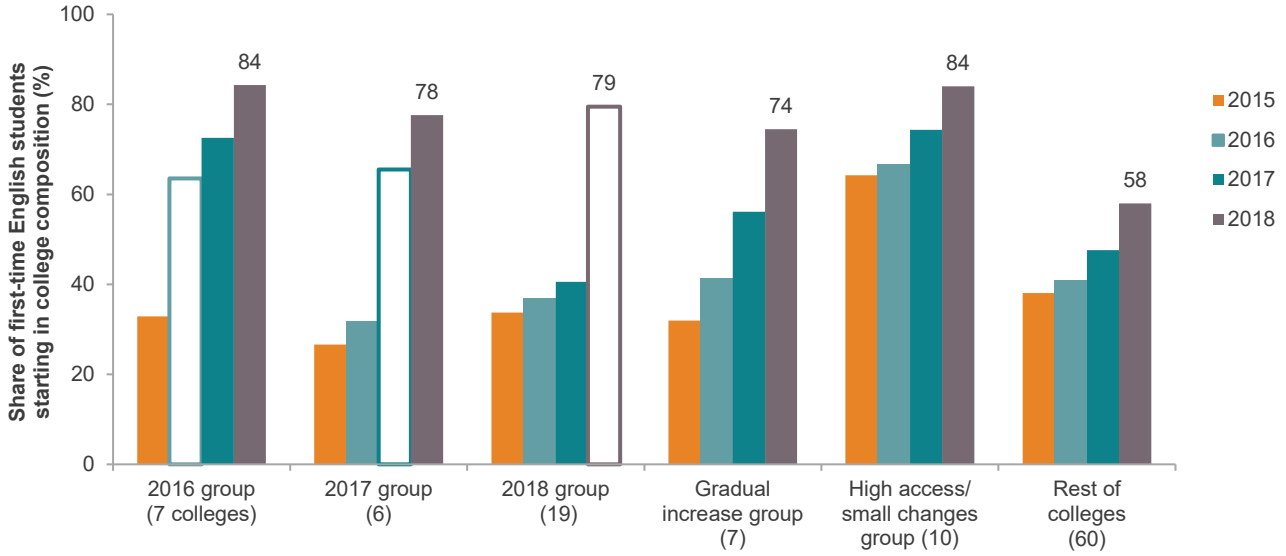
NOTE: Fall of each year. Based on 109 colleges. See Technical Appendix C for more details.

To identify the group of colleges that drove the overall increases in access to college composition we used an objective criteria. Specifically, we identified colleges that saw an annual increase of more than 25 percent points in the share of first-time English students starting directly in college composition courses. Of the 109 colleges in our sample, 32 colleges met this criterion at some point between fall 2016 and fall 2018. Mt. San Antonio, Los Medanos, Citrus, Folsom Lake, American River, Cabrillo, and San Mateo saw the biggest one-year changes (more than 40 percentage points!). But because this criterion misses colleges where the change happened more gradually, we also identified colleges that registered a cumulative increase of 35 percentage points or higher between 2015 and 2018; 7 colleges met this criterion (see Table E1 in Technical Appendix E for the complete list of colleges). It is safe to assume that these colleges engaged, in some degree or another, in placement reform. In this group of 39 colleges, the share of first-time English students enrolling directly into college composition increased 47 percentage points between 2015 and 2018; meanwhile in the rest of the colleges, the increase was 20 percentage points (see Table E2 in Technical Appendix E). All racial/ethnic groups saw important increases in access; increases were especially large for Latino and African American students (51 percentage points each), which meant that gaps in access narrowed significantly (see Table E5 in Technical Appendix E). These colleges, combined, enrolled about 47,600 first-time English students directly in college composition in fall 2018, which represent 45 percent of the system-wide total.

Figure 3 shows the number of colleges that met the criteria each year (in the horizontal axis), and how the share of first-time English students going directly into college composition changed in the four-year period. For comparison, we include a "high access/small changes" category—10 colleges at which at least 80 percent of first-time English students started in college composition in 2018 but that did not see large increases in access during this period. This category includes colleges such as Berkeley City, Moorpark, MiraCosta, and Santiago Canyon, which had large shares (70% to 79%) of students enrolled directly in college composition courses in the baseline year. Finally, the "rest of colleges" category includes 60 colleges that did not meet any of the criteria described above, either because they have not implemented changes to their assessment and placement structures or because the changes they made have not translated to a significant increase in access as defined in this report.

FIGURE 3

Most colleges that saw big jumps in access enrolled more than 70 percent of students directly in college composition in fall 2008



SOURCE: Authors' calculations based on CCCCO MIS data.

NOTES: Fall of each year. Based on 109 colleges. Unfilled bars represent the year when the big gains in access to transfer-level English happened. Colleges are only counted once in the year in which they saw a big increase in access. Therefore, colleges in the 2016 group are an entirely different group than colleges in the 2017 group, and so on.

There are few things to highlight. First, at most colleges, access continued to increase after the first jump, which may indicate that colleges were fine-tuning reforms. For example, looking at the colleges that significantly broadened access in fall 2016, the share of first-time English students enrolling directly in college composition increased from 33 percent in the baseline year to 64 percent in 2016, 73 percent in 2017 and finally to 84 percent in fall 2018. It is worth noting that these colleges reached the level of traditionally high-access colleges by fall 2018.[8]

[8] Basic Skills and Student Outcomes and Transformation grants were instrumental in the reform efforts of many of the colleges that saw big jumps in access in 2016 and 2017.

Second, change accelerated as the deadline for full implementation of AB 705 approached. Three times as many colleges saw large changes in access in 2018 compared to 2017 and 2016, and the gains were larger than in previous years. The annual increase in the share of first-time English students enrolling directly in college composition was on average 31 percentage points at the colleges that saw the big jump in 2016, compared to 39 percentage points on average at the colleges that saw the big jump in 2018. In Mt. San Antonio, for example, the share of first-time students starting directly in college composition increased by 74 percentage points from 22 percent in 2017 to 95 percent in 2018; this meant that 2,365 additional first-time English students started in college composition.

Third, there was a system-wide trend toward increased access. This is evident while looking at the "rest of colleges" category. In this group of colleges, the share of students starting in college composition increased 20 percentage points between 2015 and 2018, which is consistent with the fact that most colleges in the system were in some phase of examining their placement processes during our period of analysis. According to the MMAP, over 90 colleges have worked with them to pilot multiple measures placement policies.[9] Similarly, according to an AB 705 implementation survey done by the Research and Planning Group for California Community Colleges (RP Group), 75 colleges reported using high school transcript data to assess students who completed four years of high school in fall 2018.[10]

As we mentioned, the "rest of colleges" group includes colleges whose changes to placement have not yet led to a big increase in access as measured in this report. There are several potential explanations. First, these colleges may not have reduced their developmental education offerings. The colleges that met our criteria reduced the number of sections below transfer-level by an average of 63 percent between 2015 and 2018; meanwhile the average reduction in the number of sections offered by the rest of the colleges was only 33 percent. Second, counselors may not have directed students to transfer-level courses. Our interviews revealed that counselors at some colleges were hesitant about phasing out developmental courses and doubtful that all students could be served well by being placed in transfer-level coursework. This highlights the importance of getting counselors on board from the beginning of the implementation process and providing them with adequate training. Third, colleges may have set their GPA/course grade thresholds for direct access into college composition at a higher level than other colleges (e.g., 3.5 versus 2.6). In our interviews, one English faculty member said that a minor adjustment in the minimum GPA requirement led to a significant increase in direct access to college composition.

Success Rates in College Composition Courses Have Not Changed Significantly

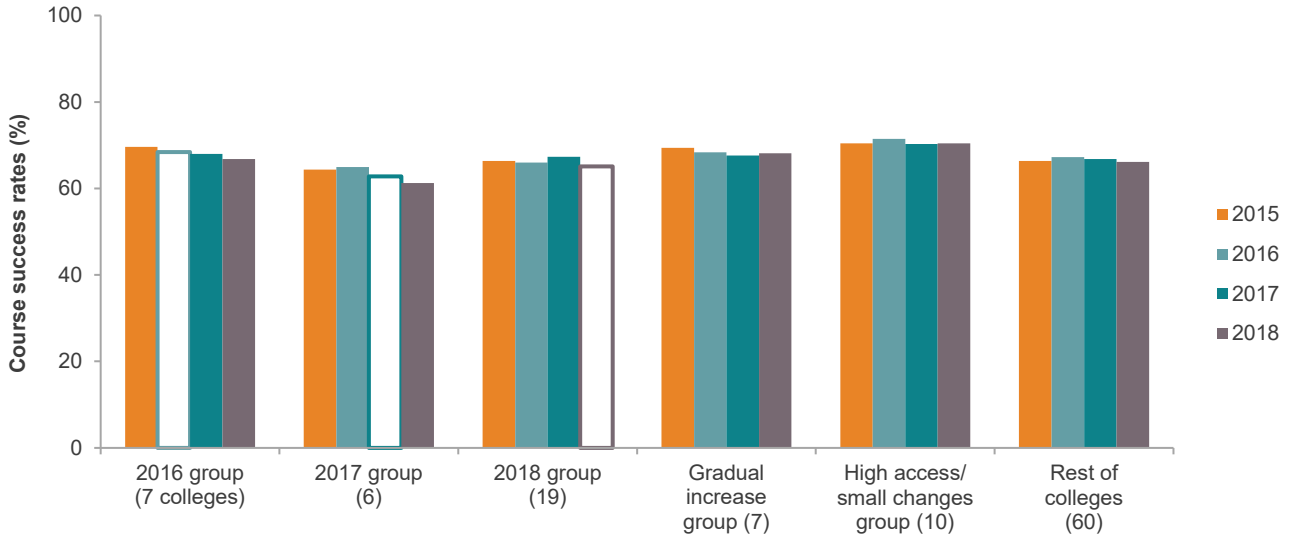
It seems reasonable to think that college composition success rates will decline, as students with more heterogeneous academic preparation levels are given access to these courses. However, we do not find any correlation between changes in college composition enrollment and changes in course success rates (see Figure E1 in the Technical Appendix E). In the group of colleges that significantly broadened access, course success rates decreased, on average, by only 1 percent in the term in which the big jump in access happened.

[9] See the Multiple Measures Assessment Project (MMAP) website for more information:
[10] This survey was completed by 104 of the 114 colleges in fall 2018.

However, this average hides some variation across the group of colleges that significantly broadened access. In fact, a couple of colleges saw a significant dip in success rates (13 percentage points). Interestingly, neither of these two colleges offered co-requisite remediation, even though 75 percent of their first-time English students went directly into college composition. Moreover, as Figure 4 shows, there is little or no difference between the group of colleges that significantly broadened access and the rest of the colleges in terms of the trajectory of course success rates over time.

FIGURE 4

Course success rates in college composition remained steady despite the increase in access



SOURCE: Authors' calculations based on MIS data.

NOTE: Share of students enrolled in college composition, with or without co-requisite support, who completed it with a grade of C or better. Fall of each year. Based on 109 colleges. Unfilled bars represent the year when the big gains in access to transfer-level English happened. Colleges are only counted once in the year in which they saw a big increase in access. Therefore, colleges in the 2016 group are an entirely different group than colleges in the 2017 group, and so on.

In our interviews, English faculty at colleges that experienced dips in course success rates were very keen to point out that many more students accessed and successfully completed the course than ever before. Faculty noted that many of the students who succeeded would have fallen victim to the attrition problem inherent in traditional developmental sequences. English faculty also noted that the students who are not doing well in college composition are probably not doing well in other courses, and highlighted the importance of assessing the needs of struggling students more holistically—including challenges students face outside the classroom related to mental health, wellness, housing and/or food insecurity, and family issues.

Throughput Increased Dramatically

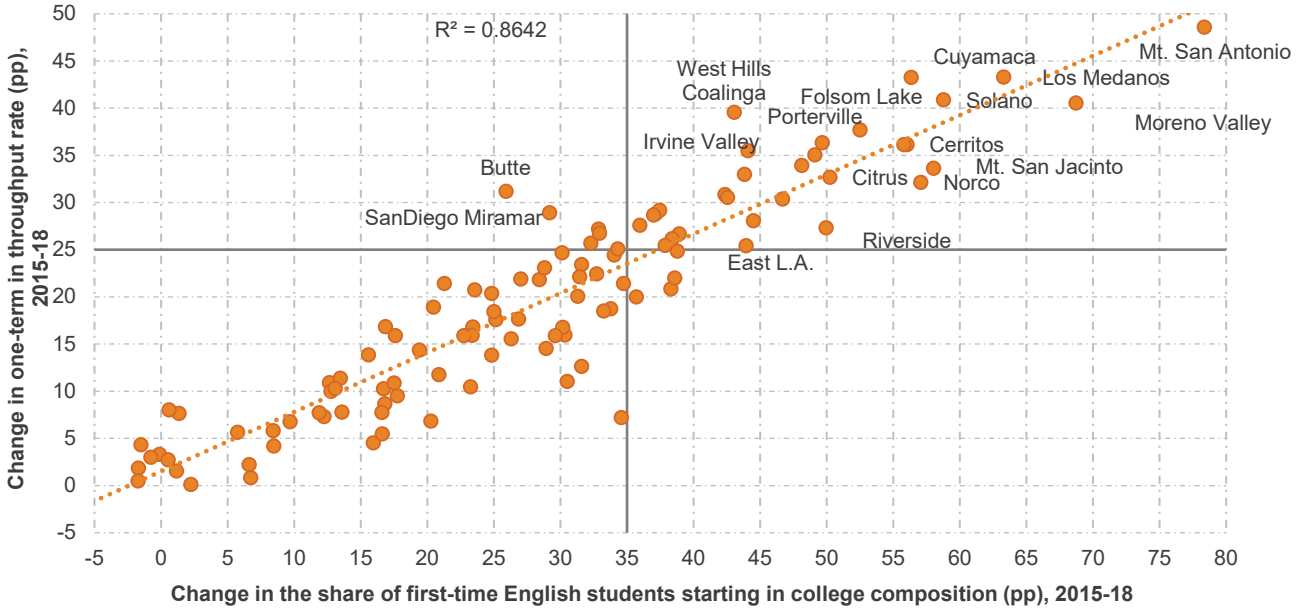
Even in colleges where success rates dipped, increases in throughput rates—that is, the proportion of first-time English students who completed college composition within one term—were significant. Between 2015 and 2018, the number of first-time English students completing college composition in one term increased by 28,000 (or 76%) system-wide. More than half of this increase (16,000, or 58%) is attributable to the group of 39 colleges that significantly broadened access. Moreover, between 2015 and 2018, the number of Latino and African American students completing college composition in one term increased by 179 percent in the group of colleges that

significantly broadened access—by about 9,200 and 685 students, respectively. At the rest of the colleges, the increase was 78 percent for Latino students and 54 percent for African American students.

When we look across all colleges, the relationship between changes in access to college composition and changes in one-term throughput rates is strong and positive (Figure 5). As we mentioned before, during our period of analysis there was probably wide variation in the specific changes to assessment and placement structures that colleges implemented, and also in the scale and type of concurrent support offered. Despite that, colleges that significantly broadened access saw big increases in throughput. Mt. San Antonio, Cuyamaca, Los Medanos, and West Hills Coalinga were among the colleges with the biggest increases in the one-term throughput rate.

FIGURE 5

There is a strong and positive relationship between changes in access and changes in throughput



SOURCE: Authors' calculation using MIS data.

NOTES: Fall of each year. Based on 109 colleges. It is important to note that even though this evidence is consistent or suggestive it is not sufficient to infer causality.

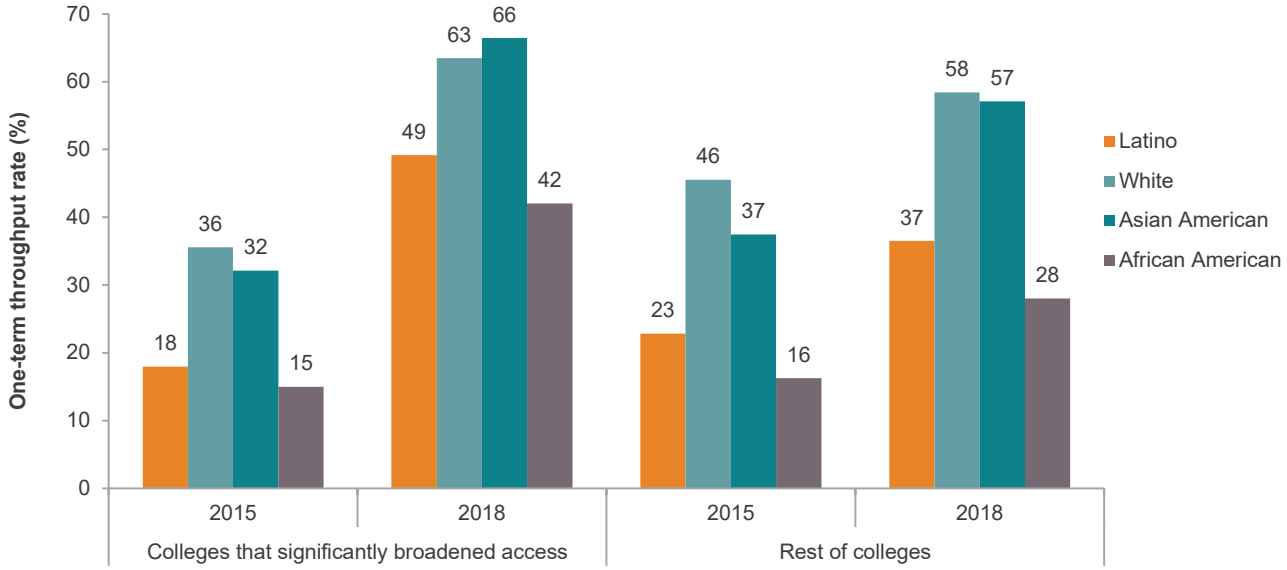
The system-wide one-term throughput rate increased from 28 percent in 2015 to 48 percent in 2018. Among the 39 colleges that significantly broadened access, throughput rates increased 30 percentage points, from 24 percent to 54 percent. Meanwhile, in the rest of the colleges the increase was 13 percentage points.[11] All four major racial/ethnic groups saw increases in throughput between 2015 and 2018, with particularly strong gains among Asian American and Latino students (Figure 6). In the group of colleges that significantly broadened access, one-term throughput rates among Latino students increased 31 percentage points; at the rest of the colleges these rates rose 14 percentage points. Likewise, throughput rates for African American students increased 27 percentage

[11] In terms of one-year throughput, which will be the measure tracked under AB 705. System-wide, college composition's one-year throughput rates increased 8 percentage points from 45 percent for the fall 2015 entering cohort to 53 percent for the 2017 entering cohort. In the 12 colleges that broadened access significantly to college composition in 2016 and 2017, the increase was 15 percentage points. College-level one-year throughput rates are available upon request.

points at colleges that significantly broadened access, while rates for African Americans at the rest of the colleges increased 12 percentage points.[12]

FIGURE 6

All four major racial/ethnic groups saw larger increases in throughput at colleges that broadened access



SOURCE: Authors' calculation using MIS data.

NOTE: Fall of each year. There are 39 colleges that significantly broadened access and 70 colleges in the "rest of colleges" category. See Table E6 in Technical Appendix E.

Did any of these gains result in a narrowing of long-standing racial/ethnic achievement gaps? In the baseline year, achievement gaps between white students and Latino, African American, and Asian American students—measured by the difference in one-term throughput rates—were smaller at the 39 colleges that significantly broadened access than in the rest of the colleges. Between 2015 and 2018, the white-Latino gap decreased by 3 percentage points at the colleges that significantly broadened access and 1 percentage point at the rest of the colleges. In contrast, the white–African American gap increased by 1 percentage point at both the colleges that significantly broadened access and the rest of the colleges. Finally, the white-Asian American gap practically disappeared in the rest of the colleges, and Asian American students outperformed white students at the colleges that significantly broadened access. Overall, these results suggest that reforms efforts have not yet resulted in dramatic reductions in longstanding racial/ethnic achievement gaps.

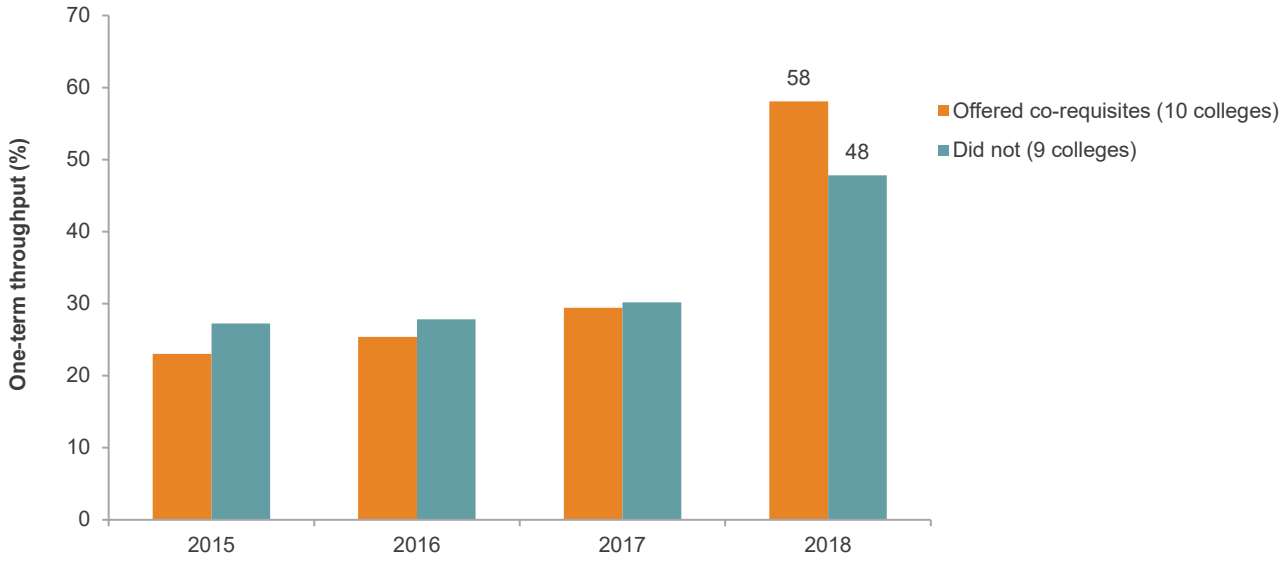
Colleges that saw the biggest increases in access and throughput used different types of concurrent support to amplify the effectiveness of their placement reforms. The prevalence, scale, and effectiveness of those supports are potential factors mediating the relationship between changes in access and changes in throughput. Indeed, not all the colleges that significantly broadened access offered co-requisite support in the year they experienced the big jump in access. Among the colleges that saw a big jump in access in fall 2018, 10 offered co-requisites and 9 did not. We

[12] In the baseline year, before any big jumps in access, the racial/ethnic distribution of first-time English students at the group of colleges that significantly broadened access does not look that different from the rest of the colleges in the baseline year. However, these colleges did have slightly higher shares of Latino and Asian American students in the baseline year (Table E3 in the Technical Appendix E).

find that at colleges that offered co-requisite support, one-term throughput rates were on average 10 percentage points higher than the rates in colleges that expanded access without offering co-requisites (Figure 7).

FIGURE 7

Among colleges that broadened access in 2018, throughput rates increased more in colleges offered co-requisites



SOURCE: Authors' calculation using MIS data.

NOTES: Fall of each year. Sample restricted to the group of colleges that broadened access to college composition in fall 2018: 19,000 students versus 13,000.

Developmental English Course Offerings Have Decreased

The number of developmental English courses offered system-wide has decreased every year since 2014, at an increasing rate (Figure E2, Technical Appendix E). Years ago, colleges began eliminating courses four and three levels below transfer-level and experimenting with compressed courses and one-term accelerated courses (Cuellar-Mejia et al. 2016, 2018). In 2018, the reduction spiked as colleges geared up for AB 705 by replacing some of their standalone developmental courses with co-requisite remediation.[13] Between 2015 and 2018, the number of developmental course sections decreased by 46 percent. Even so, almost 3,200 developmental sections were offered across the state in 2018, with an enrollment of about 80,000.

The ratio of college composition courses to developmental English courses—a proxy for the degree to which colleges are moving away from traditional remediation—increased from 0.8 to 2.0 between 2015 and 2018. The ratio of college composition to development courses at colleges like Cuyamaca, Los Medanos, MiraCosta, San Mateo, Santiago Canyon, and Solano was closer to 7. In Skyline and Mt. San Antonio it was 25 and 16, respectively.[14]

Despite dramatic reductions in developmental English offerings, there appears to be conflict brewing over whether or not colleges should continue to offer these courses at all. According to the English faculty and staff we interviewed at 16 colleges, slightly more than half (56%) of these colleges are offering developmental English courses in fall 2019. Colleges reported several motivations for continuing to offer developmental English, including

[13] In the case of English, we use the terms developmental, remedial, and below transfer-level interchangeably.

[14] Recent research examining the proportion of developmental English versus college composition course offerings at 47 colleges suggests that this trend is accelerating in fall 2019—with 88% of the total sections (college composition plus developmental English) being in college composition courses, up from 45% in 2017 (Hern 2019).

to serve students that have been out of school for a long time, to serve ESL students whose sequences lead to developmental English, or to address the needs of students with disabilities. It is important to note that all these groups do not warrant remedial placement under the law if they are degree/transfer seeking. The RP group has yet to identify a student population that does not do better when placed at transfer-level courses.[15] However, some of our interviewees pointed to the fact that offering developmental English courses was important at an open-access institution with students from diverse academic backgrounds. The diversity in student academic backgrounds and educational goals is part of what motivated Citrus College to reinstate a new set of two-unit standalone remedial English courses that are intended to provide additional support in grammar, reading, and critical thinking, especially for students who are not seeking graduation and transfer.[16] Some colleges also reported using noncredit coursework in response to the reduction or elimination of developmental English courses (see Technical Appendix B).

At the other end of the spectrum, 7 of the 16 colleges are no longer offering developmental English as of fall 2019. Colleges that had been earlier implementers of reform (2016 or 2017) were much more likely to be eliminating developmental English than colleges that implemented later. This suggests that as colleges are able to gauge student success in transfer-level courses, they see less of a need for developmental courses.

Under AB 705, colleges can continue to offer developmental courses. However, students cannot be required to enroll unless they are highly unlikely to succeed in the transfer-level course, and unless the developmental course will increase their likelihood of success. Colleges that decide to develop new developmental courses and require students to take them will have to validate that choice statistically, using data from the next two years of experimentation.[17] As research from Florida suggests, making developmental education optional is likely to considerably reduce enrollment in these courses, though historically underrepresented students could continue to enroll at higher rates (Hu et al. 2019).[18] The prospect of some colleges eliminating developmental education while others offer it on an optional basis raises questions about equity: the likelihood that historically underrepresented students will complete transfer-level English could be affected by which college they attend.

While it may seem reasonable to offer optional developmental English courses, there is the risk that students, especially those who lack self-confidence, will place themselves in these lower-level courses. It will be important for colleges that continue to offer developmental English courses to analyze their data to see who is enrolling in these courses and whether they are really serving the targeted population.

[15] See more at http://rpgroup.org/Portals/0/Documents/Projects/MultipleMeasures/Publications/AB705_DSPS_EOPS.pdf.
[16] Citrus College, which had eliminated all developmental English courses during the 2018–19 academic year, emphasized that this course would not be widely publicized and would not be a prerequisite to college composition but would be available for students who requested it.
[17] For more information, see the AB 705 Frequently Asked Questions.
[18] In 2014, Florida Senate Bill 1720 (SB 1720) mandated statewide developmental education reform. This reform made remediation optional for the majority of students, which in turn significantly reduced enrollment in those courses (Hu, Park, Mokher, Spencer, Hu, and Jones 2019).

Mathematics and Quantitative Reasoning

As we move into the analysis of what happened in terms of access and outcomes in transfer-level math, it is important to note that because fewer colleges have broadened access in this subject area, we cannot provide the same level of detail as we did in English.

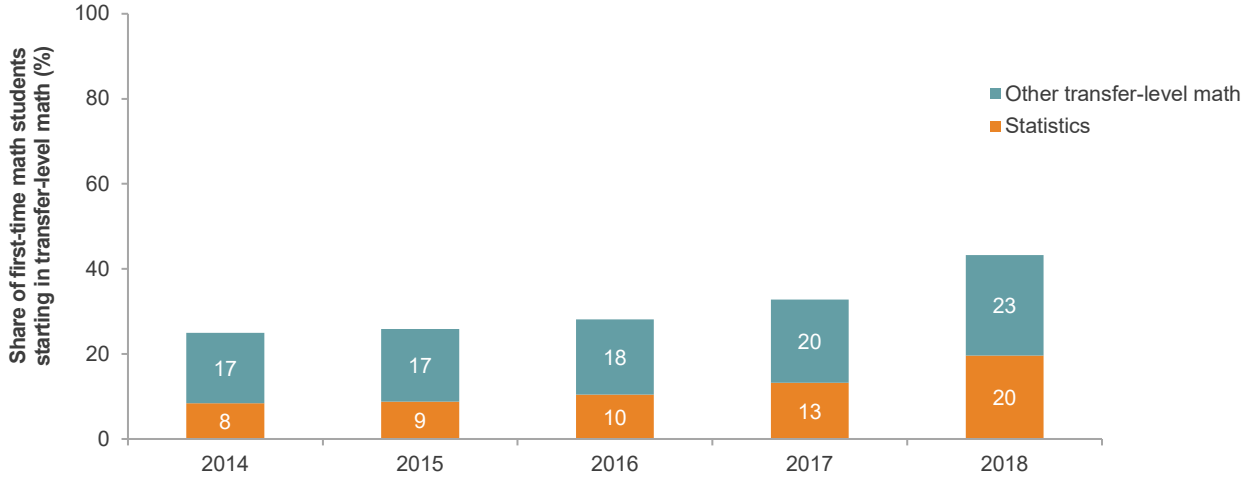
Access to Transfer-Level Courses Has Increased—but Most Students Still Start Below Transfer Level

Arguably, complexities inherent to math make it more difficult to implement placement and curricular changes. For example, placement rules and co-requisite supports need to be tailored to the math courses required for different majors (e.g., statistics, business calculus, finite math, pre-calculus, college algebra, math for liberal arts).

In 2018, the share of first-time math students starting directly in a transfer-level course was up by 17 percentage points compared to the share observed in 2015 (or about 25,000 additional students); access to transfer-level statistics increased by 11 percentage points and access to all other transfer-level math courses increased by 6 percentage points. Still, only 43 percent of first-time math students in the system were able to bypass developmental math/intermediate algebra and start directly in a transfer-level course (Figure 8). It is worth highlighting that there has also been an important shift in the first transfer-level course students take: 34 percent of first-time math students starting in transfer-level went into statistics in 2015; 45 percent did so in 2018. Indeed, direct enrollment in transfer-level statistics more than doubled between 2015 and 2018. During the same period, first-time enrollment in other transferable math courses grew only 34 percent. This trend is consistent with the development of multiple math pathways, which allows students to take paths through the math curriculum that align with their programs of study.[19] Since most students are not in STEM fields, and statistics is required for many majors, the increase that we see in the share of first-time math students enrolling in statistics is suggestive of a closer alignment with programs of study.

FIGURE 8

The development of math pathways resulted in broadening access to statistics courses



SOURCE: Authors' calculations based on CCCCO MIS data.

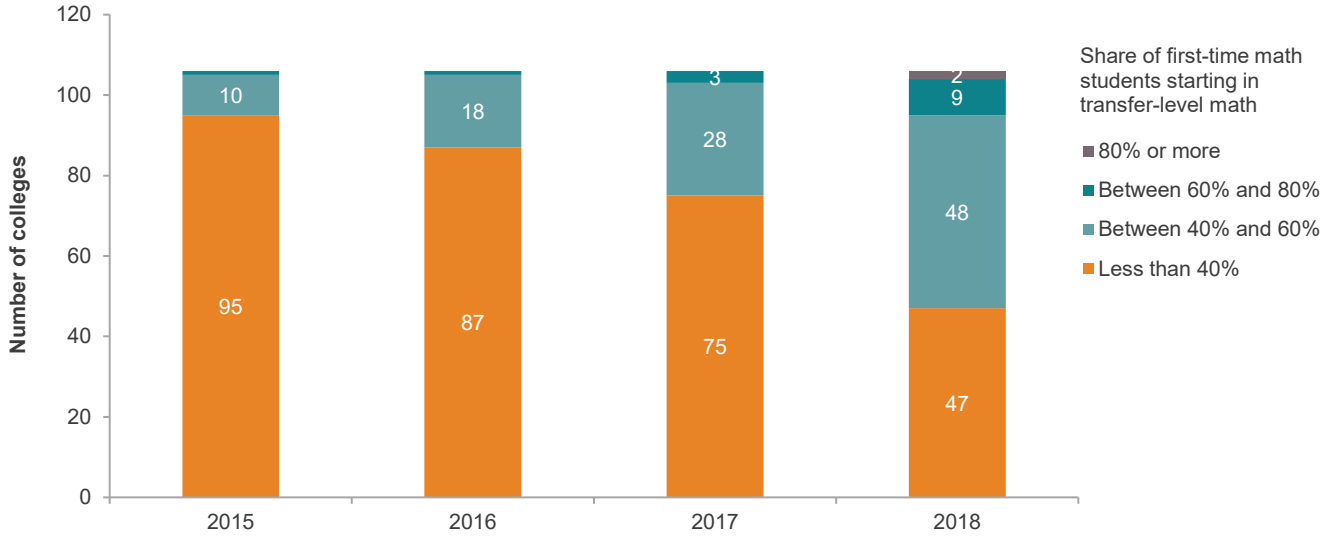
NOTES: Fall of each year. Based on 106 colleges. Other transfer-level math courses include both BSTEM math and liberal arts math courses. The number of first-time math students remained stable between 2015 and 2018 at around 153,000. See Technical Appendix C for more details.

[19] See more information on math pathways at https://wested.org/wp-content/uploads/2018/05/Multiple-Paths-Forward-Booth.pdf.

The distribution of access levels across colleges has also changed. In 2015, 95 colleges enrolled no more than 40 percent of their first-time math students directly in transfer-level math; by 2018 the number of colleges had been cut nearly in half to 47 colleges (Figure 9). There has been some progress at the top of the spectrum as well. Only one college enrolled more than 60 percent of its first-time math students in transfer-level math in 2015; 11 colleges did so in 2018.

FIGURE 9

At 11 colleges, more than 60 percent of first-time math students started at transfer level in 2018



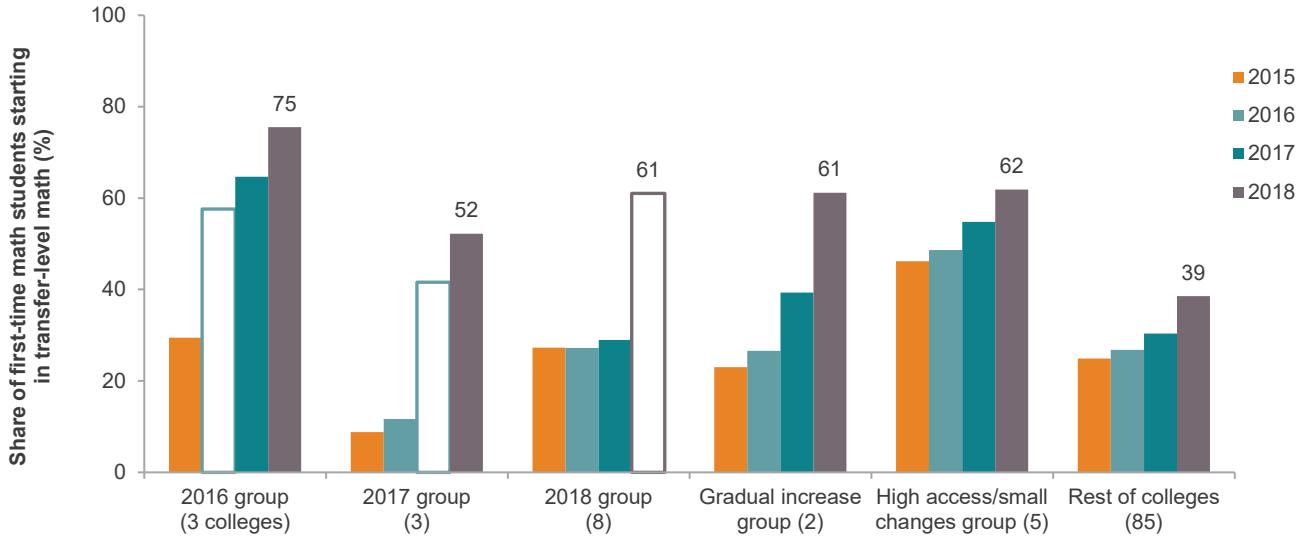
SOURCE: Authors' calculations based on CCCCO MIS data.

NOTES: Fall of each year. Based on 106 colleges. See Technical Appendix C for more details.

Figure 10 shows that only 16 colleges significantly broadened access to transfer-level math courses between 2015 and 2018 (defined as an annual increase of 25 percent points or more in the share of first-time math students enrolling directly in a transfer-level math course, or a cumulative increase of 35 percent points or more between 2015 and 2018). Altogether, these 16 colleges enrolled 60 percent of their first-time math students directly in transfer-level courses; this share is 20 percentage points higher than the share in the rest of the colleges. Five of these colleges—Foothill, Siskiyous, Cuyamaca, De Anza, and Los Medanos—enrolled more than three-quarters of their first-time math students directly in transfer-level courses in 2018. (For more information, see Technical Appendix A.) The increase in access between 2015 and 2018 was 38 percentage points in this group of colleges, compared to 14 percentage points in the rest of the colleges (see Table E8 in Technical Appendix E). All racial/ethnic groups saw important increases in access, particularly Latino students (41 percentage points increase; see Table E11 in Technical Appendix E). These colleges combined represented 14 percent of the total number of first-time math students in the system but represented 20 percent of first-time math students who went directly in transfer-level math in fall 2018 (almost 13,000 students).

FIGURE 10

The colleges that significantly broadened access had a range of pre-reform access levels



SOURCE: Authors' calculations based on CCCCO MIS data.

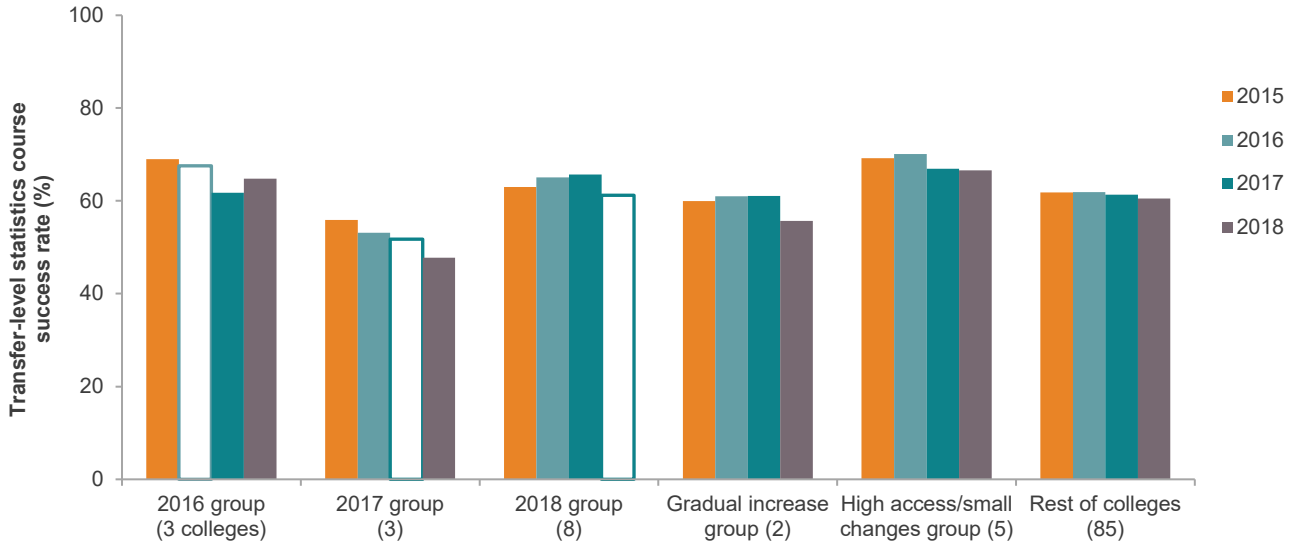
NOTES: Fall of each year. Based on 106 colleges. Unfilled bars represent the year in which the big gains in access to transfer-level math occurred. See Table E7 in Technical Appendix E for the list of colleges that significantly broadened access to transfer-level math.

Success Rates in Statistics Courses Have Dipped

Because most of the increase in access to transfer-level math courses was driven by access to introductory statistics courses, we will focus on what happened to success rates in statistics courses. Even in the absence of large changes in access, success rates in transfer-level statistics courses vary widely from term to term and oftentimes from section to section. Relative to the "rest of colleges"—where, on average, transfer-level statistics courses success rates have remained constant—in the group of colleges that significantly broadened access, course success rates have dipped (Figure 11). However, the magnitude of the decline varied: in 6 colleges, course success rates declined 3 percentage points or less between 2015 and 2018; in 2 colleges the decrease was higher than 5 percentage points but less than 7 percentage points; in 5 colleges the declines surpassed 10 percentage points; and in 2 colleges success rates increased.

FIGURE 11

Success rates dipped at most colleges that broadened access



SOURCE: Authors' calculations based on CCCCO MIS data.

NOTE: Fall of each year. Based on 106 colleges. Unfilled bars represent the year when the big gains in access to transfer-level math happened.

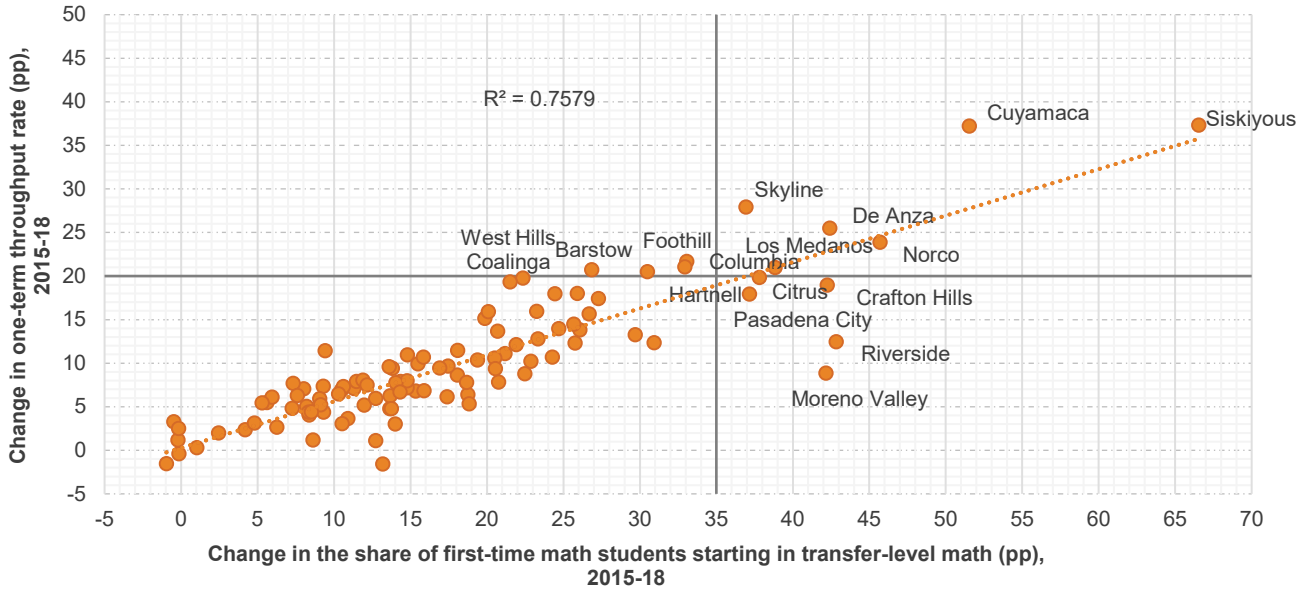
The math department chair at one college indicated that "they expected dips from day one." In fact, there was consensus among our group of interviewees that math departments are willing to accept the tradeoff between access and course success rates because "before, students couldn't even get to that [transfer-level statistics] class"—that is, many students never made it through lengthy developmental math sequences and into transfer-level courses. Importantly, there was also a consensus that the dips in success rates should and could be mitigated. Several math faculty indicated that it is important to provide more support for struggling students in the classroom—for example, embedding tutors, providing "just-in-time" remediation, and incorporating student-centered learning practices. One of the interviewees indicated that providing this support requires a significant amount of ongoing training, participation in communities of practice, and mentoring. Two other math faculty indicated that non-academic challenges also need to be addressed; many students may struggle with "learning how to be a college student" and many are dealing with issues outside of the classroom, like work and family responsibilities. Faculty indicated that some ways to address these issues include the use of early alert systems and the implementation of "just-in-time" counseling that provides students with information about how to improve study skills and overcome challenges.

Throughput Increased at Colleges That Broadened Access

As it is in English, the relationship between increases in access to transfer-level math and changes in one-term throughput rates is strong and positive (Figure 12). As we mentioned before, it is very likely that during our period of analysis colleges were approaching both placement reform and concurrent support in a variety of ways. Despite this variation, colleges that broadened access saw big increases in throughput; Siskiyous, Cuyamaca, and De Anza saw some of the biggest increases.

FIGURE 12

There is a strong and positive relationship between expanded access to transfer-level math and changes in throughput



SOURCE: Authors' calculations using MIS data.

NOTE: It is important to note that even though this evidence is consistent or suggestive it is not sufficient to infer causality.

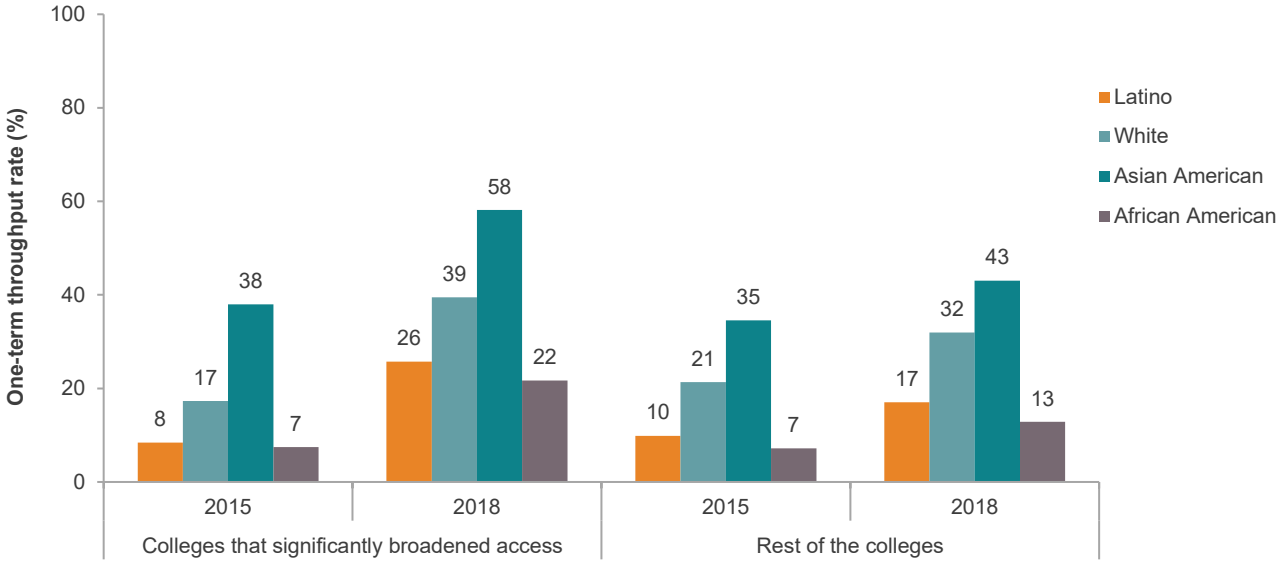
In the 16 colleges that significantly broadened access to transfer-level math, one-term throughput rates increased from 17 percent to 35 percent between 2015 and 2018, a gain of 18 percentage points. Meanwhile, in the rest of the colleges the increase was 8 percentage points (from 17 percent to 25 percent). The gains in one-term throughput rates varied widely from 9 percentage points to 37 percentage points between 2015 and 2018. It is important to note that one-term throughput rates also varied widely in the group of colleges that significantly broadened access, from 12 percent to 62 percent, which speaks to the diversity of this group of colleges in terms of student outcomes.

All four major racial/ethnic groups saw increases in throughput; gains were particularly strong among white and Asian American students (Figure 13). Between 2015 and 2018, one-term throughput rates among Latino students increased by 17 percentage points in the colleges that significantly broadened access and by 7 percentage points in the rest of the colleges. Throughput rates for African American students increased 14 percentage points in the colleges that broadened access and only 6 percentage points in the rest of the colleges.[20]

[20] In the baseline year, colleges that broadened access had slightly higher shares of Asian American students and lower shares of white students but in both cases Latino students constituted the majority of the student body (see Table E9 in Technical Appendix E).

FIGURE 13

All four major racial/ethnic groups have seen larger increases in throughput rates at colleges that broadened access



SOURCE: Authors' calculations using MIS data.

NOTE: Fall of each year. There are 16 colleges that significantly broadened access and 90 colleges in the "rest of colleges" category. See Table E6 in Technical Appendix E.

Our findings suggest that racial/ethnic achievement gaps widened some between 2015 and 2018. In the baseline year, achievement gaps between white students and Latino, African American and Asian American students—measured here as the difference in one-term throughput rates—were slightly lower in the 16 colleges that significantly broadened access than in the rest of the colleges. For example, the white-Latino gap was 9 percentage points in the group of colleges that broadened access versus 11 percentage points at the rest of the colleges. However, achievement gaps deepened in both groups of colleges between 2015 and 2018, and did so more in the group of colleges that significantly broadened access. In these colleges, the white-Latino gap increased from 9 percentage points to 14 percentage points. At the rest of the colleges, the white-Latino gap increased from 11 percentage points to 15 percentage points.

It is worth noting that throughput rates were slightly higher for Latino students than for white students at Cuyamaca and Los Medanos in fall 2018. Both colleges had white-Latino achievement gaps in 2015, and both broadened access and introduced co-requisites in 2016. In contrast, at 5 of the 16 colleges that broadened access the white-Latino gap ranged from 15 percentage points to 28 percentage points in 2018; these gaps were anywhere from 5 percentage points to 24 percentage points wider than the gaps observed in 2015. The white–African American gap increased 8 percentage points at the colleges that significantly broadened access and 5 percentage points at the rest of the colleges. In math, Asian American students outperform white students; between 2015 and 2018 the Asian American–white gap in throughput rates narrowed slightly in both groups of colleges.

Below Transfer-Level Math Offerings Declined but Not as Much as in English

Colleges are restructuring their developmental education offerings in different ways in response to AB 705 mandates. A few are moving away from traditional remediation, while the majority are continuing to offer some below transfer-level courses.

Between 2015 and 2018, below transfer-level math offerings (including degree-applicable intermediate algebra) declined by 18 percent, while the number of transfer-level math sections increased by 22 percent (See Figure E3 in Technical Appendix E). Still, almost 5,800 sections of below transfer-level math were offered system-wide in fall 2018, with an enrollment of about 178,000. This means that for every transfer-level course section, there was a below transfer-level math course section. However, at colleges such as Cuyamaca, De Anza, Foothill, and MiraCosta, which have reduced their below transfer-level offerings by at least half, there were more than three times as many transfer-level math courses as below transfer-level courses in fall 2018.[21]

Colleges are also developing new offerings. Of the new below transfer-level courses offered in fall 2018, many of the new courses were designed for students pursuing business, science, technology, engineering and math (BSTEM) majors to ensure they mastered intermediate algebra, which is a prerequisite for the calculus pathway. We identified 11 colleges who compressed elementary and intermediate algebra into a single course and at least 8 colleges that started to offer co-requisite support for their intermediate algebra courses. However, we also identified 8 colleges that started to offer pre-statistics courses. This move seems counter intuitive given the existent evidence that shows dramatic differences in outcomes between co-requisite and prerequisite statistics pathways (Rodriguez et al. 2017, 2018).

We conducted interviews with five colleges that significantly broadened access to transfer-level math and found that all are offering a reduced number of below transfer-level math courses in fall 2019. A primary motivation is to ensure that students who did not complete the prerequisites for BSTEM math courses had the option to enter those pathways. Our interviewees also suggested that changes to the placement process will reduce enrollment in these courses. For example, now that the multiple measures placement process includes a question about intended programs of study, students at two of the colleges will now only receive placement recommendations that align with their program pathway; for many this will be statistics, with or without support. Previously, all students, including non-BSTEM students, were given a list of the courses they were eligible for, including developmental courses and intermediate algebra, even though they were also eligible for statistics. Interestingly, colleges have found that many students choose to take lower-level courses when these are presented as options (Ngo and Kwon 2015; Kosiewicz 2014). Faculty indicated that these decisions are often a result of a "lack of confidence"; some students put off college-level courses because they are daunted by statistics and more familiar with algebra, and some want to keep their options open (they may want to major in STEM). Still, one college is continuing to offer dual placements into STEM and statistics pathways out of concern that statistics courses may not fulfil the math requirement at some four-year colleges (or for some majors) upon transfer.

[21] A recent study of 47 colleges finds that in the first semester of full implementation of AB 705 there was a substantial increase in the share of transfer-level math sections as a share of total sections (introductory transfer-level math sections plus developmental math sections): growing from 33 percent in fall 2017 to 71 percent in fall 2019 (Hern 2019)

A Look at Co-requisite Support Models

It is expected that colleges will offer some form of concurrent support to help students to succeed under the new placement system. Our focus in this report is on co-requisite courses because we are not yet able to consistently identify and measure participation in other forms of concurrent support (e.g., writing labs, tutoring centers, supplemental instruction).[22]

Information on co-requisite courses is not currently available through the MIS data.[23] Therefore, we relied on an exhaustive scan of college websites, catalogs, and course schedules to identify co-requisite course offerings across the system. Colleges started experimenting with co-requisite support in transfer-level math and English as an alternative to standalone developmental courses as early as the fall 2016. Enrollment in co-requisite support courses has grown significantly in English but only modestly in math.

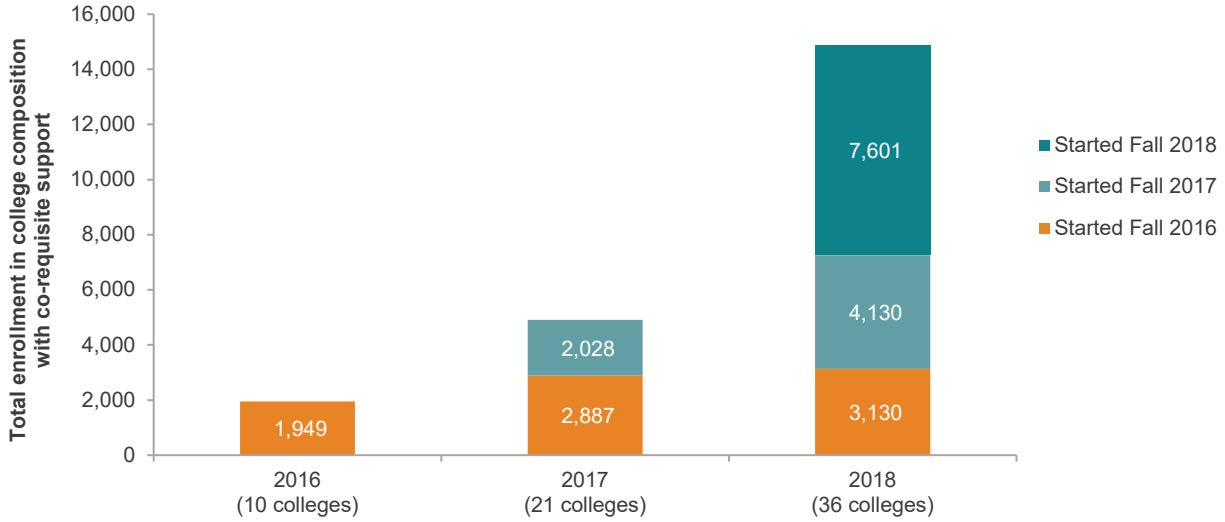
Between 2016 and 2018, the number of students enrolled in college composition with co-requisite support increased from about 2,000 to almost 15,000 (Figure 14). The explanation for this increase is twofold: more colleges have started to implement co-requisites, and colleges have scaled up co-requisite offerings—in many cases, colleges have moved from small pilots to replacing almost all developmental courses. In fall 2018, 36 colleges offered at least a couple of sections of co-requisite support, and co-requisite students represented 20 percent of the total number of students enrolled in college composition at these schools. However, there was wide variation across colleges.

[22] Indeed, a study of 47 colleges in the Central Valley, Inland Empire and the Greater Los Angeles region found that in that in fall 2019, 83 percent of colleges offer co-requisite courses in English, 70 percent in statistics, and 64 percent in BSTEM math (Hern 2019).

[23] To better evaluate the implementation of AB 705 and meet other goals, the California Community Colleges Chancellor's Office has created two new Course Basic (CB) MIS data elements. CB25, General Education Requirements, allows colleges to identify courses that fulfill degree or general education requirements in the categories of Composition/Critical Thinking and Mathematics/Quantitative Reasoning/Analytical Thinking, as well as those that meet local competency requirements. CB26, Course Transfer Type, allows colleges to distinguish support courses associated with AB 705 implementation from noncredit, pre-collegiate courses that are associated with efforts such as the California Adult Education Program (CAEP). It can also be used to evaluate AB 705, to examine how support courses relate to student outcomes such as enrollment patterns, completing general education requirements, earning an award, or transferring to a four-year institution. Colleges are expected to make revisions to their codes in time for their winter MIS submission, to better track outcomes in the first term of 2019–20.

FIGURE 14

About one in three community colleges offered college composition with co-requisite support in fall 2018



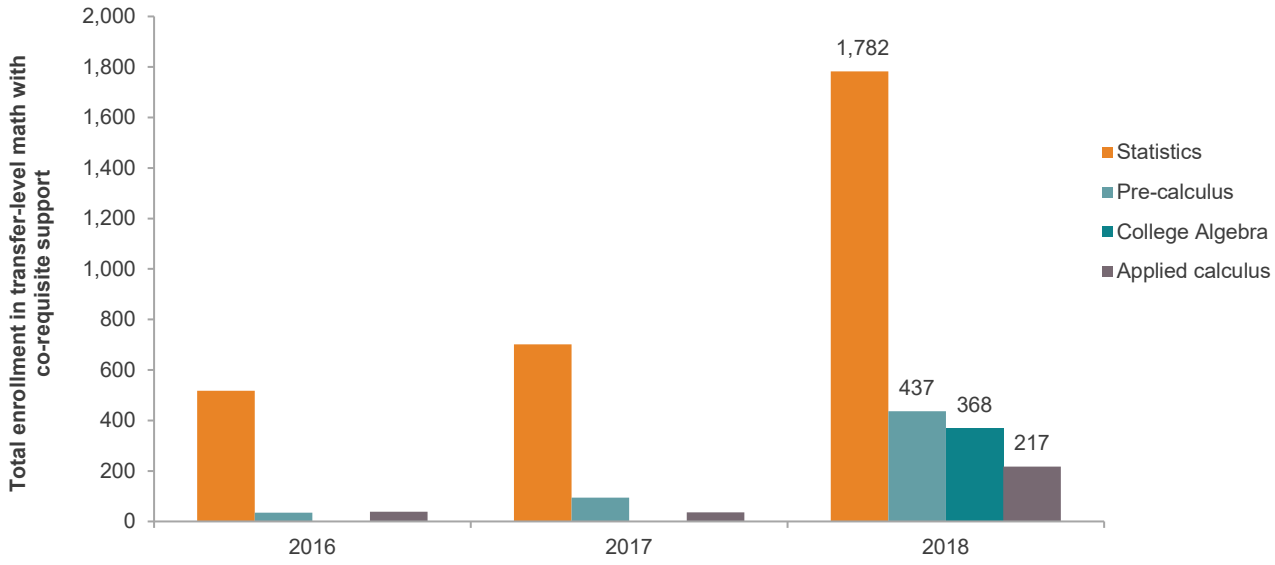
SOURCES: Authors' calculations based on California Community Colleges Chancellor's Office MIS and PPIC's college catalogs scan.

NOTES: Fall of each year. See Table E13 in Technical Appendix E.

In math, the adoption of co-requisite models was less common. Only 12 colleges offered co-requisite support as of fall 2018, mostly for elementary statistics students (9 colleges). Less than a handful of colleges offered pre-calculus, college algebra, and applied calculus with co-requisite support. Overall, about 2,800 students were enrolled in a transfer-level math course with support (Figure 15). Cuyamaca, MiraCosta, Crafton Hills and Mt. San Antonio offered co-requisite support for at least two transfer-level math courses.

FIGURE 15

The number of students getting co-requisite support in math is still small but growing



SOURCES: Author's calculations based in MIS data and scan of college catalogs, class schedules and websites.

NOTES: Fall of each year. Two colleges offered co-requisite support for statistics in 2016, four in 2017 and nine in 2018.Only one college offered pre-calculus support in 2016 and 2017. See Table E15 in Technical Appendix E.

Given the size and diversity of the California community college system, it is not surprising to see wide variation in the way that colleges are approaching co-requisite remediation. In fact, among the colleges that offered co-requisite remediation in fall 2018, it is possible to identify at least four different models of co-requisite support, drawn from models implemented around the country (Daugherty et al. 2018; Dana Center 2018).[24]

- **Linked**: Students enroll in designated sections of the transfer-level course as well as a one- to three-unit linked support course. All students in these designated sections take the co-requisite support course. Usually, the transfer-level and co-requisite courses are taught by the same instructor, and in most cases the two courses are scheduled back-to-back.
- **Modified ALP**: Inspired by the Accelerated Learning Project at the Community College of Baltimore County, this is similar to the linked model except that co-requisite support students are mixed with non-support students in the transfer-level course.
- **Enhanced transfer-level course**: The transfer-level course and co-requisite support are provided in a single course that is worth more credits than a regular course.
- **Combined:** Students take a standalone remedial course and the college composition course in the same term.

Approaches can vary even across colleges that offer the same model of co-requisite support—for example, there could be differences in the content and timing of remediation, whether (and which) students are directed to take co-requisite courses, and the use of technology. At some colleges, the transfer-level course is open access and students decide if they want to take it with co-requisite support or not. At other colleges, students in a given high school GPA range are required to enroll in the co-requisite. Table 1 summarizes the variation we see in the scale of implementation, co-requisite model type, and other characteristics.

[24] Some consider stretch models to be co-requisites, but we do not include them, given that stretch courses are completed over two terms while co-requisites are completed in only one. This distinction is important because stretch models have transition points that could lead to attrition; co-requisites eliminate this problem by enabling students to complete the transfer-level course in a single semester. The stretch model used most widely in California is known as Statway; which is part of WestEd's Carnegie Math Pathways (CMP). In its standard format, Statway is a two course "stretch" model that covers topics common to introductory college statistics and embeds remediation that is needed for success. CMP is offered at 16 schools in California. In 2018, CMP released Statway Corequisite and Quantway Corequisite, which incorporate the pedagogical strategies that are the trademark of Carnegie Math Pathways. Six schools across the country have implemented these courses. For more information see https://carnegiemathpathways.org/

TABLE 1

Co-requisite support has been implemented at different scales and in different formats

	English 36 colleges	Math 12 colleges
Scale	The group of 36 colleges offering co-requisite courses includes colleges that are just in the piloting stage (e.g., Riverside and Saddleback), colleges that started out at full scale (e.g., Citrus and Los Medanos), and colleges that have moved from pilot to full scale (e.g., Cerritos, Cuyamaca, and Sacramento City). All but 4 enrolled more than 100 students in the co-requisite model. In half of the colleges, co-requisite enrollment represented less than 20 percent of total enrollment in college composition. In Citrus, Los Medanos, San Mateo, and Skyline, about half of enrollment in college composition was in the co-requisite model. Folsom Lake had the lowest ratio of college composition sections to co-requisite sections, with about two college composition sections for every co-requisite section.	The group of 12 includes colleges that are in the piloting stage and colleges that either started out at full scale or have moved from pilot to full scale. All but 4 of the colleges enrolled more than 100 students in the co-requisite model. In Crafton Hills, Cuyamaca, MiraCosta, and Citrus, at least one-third of enrollment in transfer-level statistics had co-requisite support. Enrollment in pre-calculus with concurrent support represented half of pre-calculus enrollment in Foothill, slightly more than one-third in Cuyamaca, and one-quarter in MiraCosta. In Crafton Hills, about 40 percent of enrollment in college algebra had co-requisite support.
Type	A linked model was used at 27 colleges in fall 2018. An enhanced college composition course was offered at 4 colleges: Fullerton, Modesto, Skyline, and San Mateo. A modified Accelerated Learning Program (ALP) model was used at 3 colleges: Sacramento City, Cosumnes River, and Redwoods. MiraCosta College used this model in 2016 and 2017 but switched to the linked model in 2018. A "combined" model was offered at 2 colleges: West Hills Coalinga and West Hills Lemoore. More recently, West Hills Coalinga has moved to offering a noncredit co-requisite support course instead.	All but 2 colleges offered the linked co-requisite model in fall 2018. Mt. San Antonio offered two sections of integrated statistics, a 5-unit enhanced course that includes support. Glendale and Columbia offered a modified ALP model.
Unit load	In almost half of the group, the total load of the co-requisite model was 5 units. However, the split between the transfer-level course and the support course varied. Five colleges offered a 1-unit support course and 8 colleges offered a 2-unit support course. At 14 colleges, the total load was 6 units, with 4 colleges offering a 3-3 split. Finally, 4 colleges offered a 1-unit support course paired with a 3-unit transfer-level course. There was agreement among the faculty we interviewed that the extra units (or the extra time) were predominately devoted to "just-in-time" remediation, addressing the affective domain, collaborative activities, and in-class writing and reading.	The typical unit load was 6 units— a 4-unit transfer-level course plus a 2-unit support course. But some colleges deviated from this norm. MiraCosta, for example, offered a 3-unit transfer-level statistics course with a 1-unit support course. Cuyamaca (3-2 split) and Glendale (4-1 split) also had a unit load below the median. At the other extreme, the pre-calculus co-requisite at Cuyamaca was 8 units total.
Other characteristics	At all colleges, the same instructor taught the college composition and the support course. All but 2 colleges scheduled the two courses back-to-back. At 23 colleges, the support course was always after the college composition course; at 7 colleges, some support sections were scheduled before and some after.	At 7 colleges (and in 11 courses), the support and transfer-level courses were offered back-to-back. Three of the support course were scheduled after the transfer-level, while in three cases, some sections were scheduled before and some after. In all but two colleges, both courses were taught by the same instructor.

The throughput rates that we are seeing from early implementers of co-requisite remediation are very impressive. Below we describe what we see when we compare one-term throughput rates for co-requisite students versus one-year throughput rates for students in developmental sequences. We then present evidence of how co-requisite students perform in subsequent courses. We focus mainly on English because we have a larger sample of co-requisite students; however, we also include some data for math.

Comparing gains in throughput for co-requisite students and developmental students

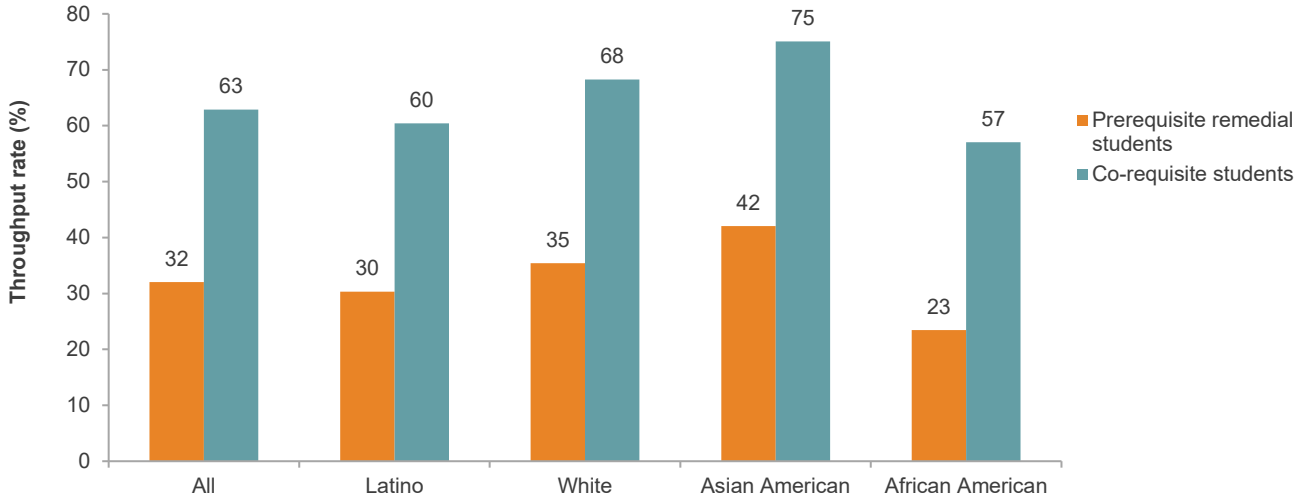
Among first-time English students who started in a co-requisite model in fall 2018, 63 percent completed the college composition course on their first try. However, there was a wide range. In two colleges the one-term throughput rate was below 50 percent. At the other end of the spectrum, seven colleges had rates above 70 percent.[25] Meanwhile, the

[25] We are excluding any college with a cohort of less than 100 students in the throughput calculations.

average one-year throughput rate for students who started in developmental English in fall 2017 was 32 percent; across colleges, it ranged from 20 percent to 45 percent. In every college, one-term throughput for co-requisite students was higher than the one-year throughput rates of students starting in developmental education (See Table E14 in Technical Appendix E). Most often, the gains in throughput surpassed 30 percentage points. Moreover, the gains in throughput rates are significant for every racial/ethnic group (Figure 16).[26]

FIGURE 16

Gains in throughput from co-requisites are large for every racial/ethnic group



SOURCE: Authors' calculations based on California Community Colleges Chancellor's Office MIS and PPIC's college catalogs scan.

NOTES: One-term throughput rate of co-requisite students in fall 2018 versus the one-year throughput rate among first-time remedial students in fall 2017. Remedial students are students who started in any developmental English course that is a prerequisite for college composition. Sample restricted to degree/transfer seeking students. Based on 27 colleges. We exclude any college with a cohort of less than 100 students in the throughput calculations. Compares 20,325 first-time remedial students in fall 2017 versus 7,605 first-time co-requisite students in fall 2018.

Throughput gains of co-requisite students in math relative to remedial students were also high—however, it is worth noting that this comparison involves a smaller number of colleges and students. Among first-time math students who started in a co-requisite model in fall 2018 in one of the five colleges with at least 100 students enrolled in co-requisites, 65 percent completed the transfer-level math course on their first try. However, these one-term throughput rates ranged widely, from 49 percent to 76 percent. Meanwhile, the average one-year throughput rate for students who started below transfer-level math in fall 2017 was only 14 percent, ranging from 8 percent to 21 percent. In every college, the one-term throughput of co-requisite students was larger than the one-year throughput of students starting in developmental education, and most often the difference surpassed 50 percentage points.

How do co-requisite students perform in college composition and in subsequent courses?

Critics of co-requisite remediation argue that replacing prerequisite remedial courses with co-requisite courses leads to lower academic standards and weakens students' foundational knowledge for subsequent courses. In fact,

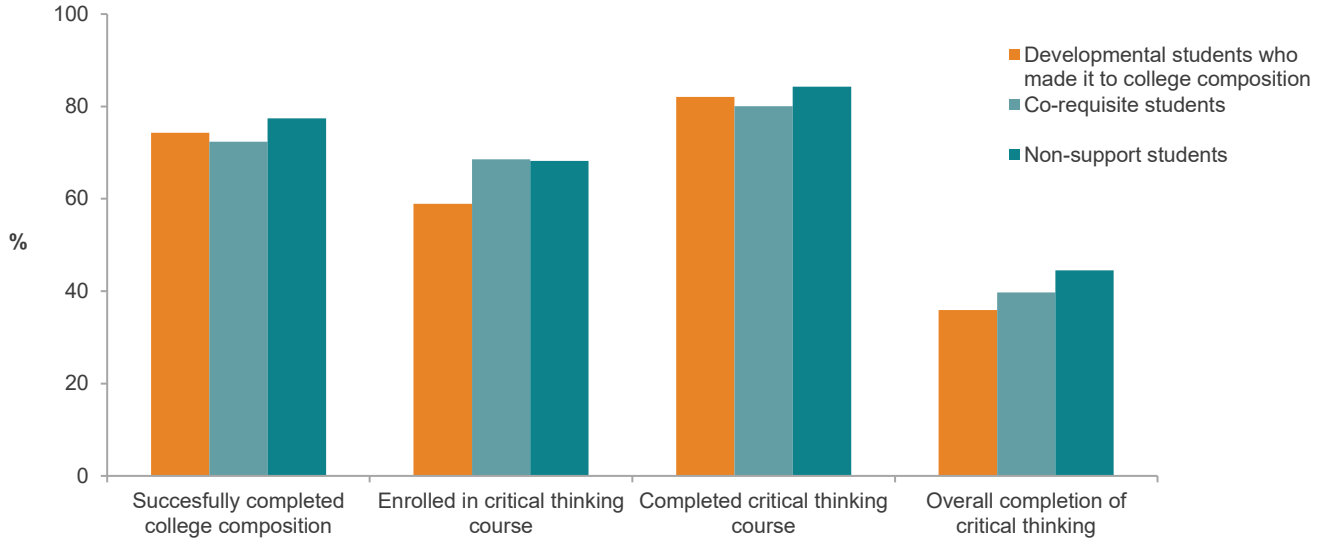
[26] A valid question at this point is what happens to co-requisite students who failed in their first attempt. Among students who enrolled in a co-requisite course in fall 2016 (1,173 students in the 5 colleges with a co-requisite enrollment of more than 100 students), we find that 68 percent of first-time English students succeeded in their first attempt, 3 percent completed college composition in the second try, 5 percent did so after the one-year mark, and 23 percent had not completed it as of fall 2018. Similarly, among students who enrolled in a co-requisite course in fall 2017 (3,134 students in the 13 colleges with enrollment over 100), 68 percent succeeded on the first try, 3 percent did so in the following term, 2 percent completed composition beyond the one-year time frame, and 27 percent of students had not passed college composition as of fall 2018.

emerging research from community colleges in California and New York suggests that the opposite is true in both math and English (Newell 2019; Scott 2019; Cuyamaca College IESE 2018; Logue et al 2016, 2019).

Using students enrolled in college composition in fall 2017 and following them through fall 2018, we calculated enrollment and success rates of co-requisite students in subsequent courses that satisfy the critical thinking requirement at the 20 colleges that offered co-requisites in that term.[27] We compare these results with those for students who took developmental courses prior to enrolling in college composition. This allows us to assess the performance of co-requisite students in subsequent courses. Our evidence shows that students who took the English co-requisite were as likely to complete college composition with a C or better as students who took developmental courses; they were more likely to enroll in a critical thinking course and equally likely to successfully complete that course. Overall success (completion of both the composition course and the subsequent critical thinking course) was slightly higher among co-requisite students (Figure 17).[28]

FIGURE 17

Co-requisite students and students who started in developmental education were equally likely to succeed in critical thinking courses



SOURCE: Authors' calculations based on MIS data.

NOTES: We followed students who took college composition in fall 2017 through fall 2018. We restrict our sample to the 20 colleges that offered co-requisites during that term. The group includes 3,392 co-requisite students (i.e., first-time English students enrolling directly in the co-requisite course), 5,192 students enrolled in prerequisite developmental education prior to taking college composition, and 14,242 students enrolled in college composition without support. Differences between co-requisite and remedial students in terms of success rates are not statistically significant at $p<0.01$; similarly, differences in terms of likelihood of enrollment in the critical thinking course between co-requisite students and students without support are not statistically significant at $p<0.01$. For each set of bars, the denominator is the students with a successful outcome in the previous bar. Overall success is the share of students who enrolled in college composition and successfully completed critical thinking.

[27] To meet degree and transfer requirements, community college students take a course in the area of critical thinking. Area 1B - Critical Thinking - English Composition of IGETC and/or A3 of CSU GE-Breadth. IGETC Area 1B courses must include explicit instruction in both composition and critical thinking, and students' writing must be evaluated for both critical thinking and English composition. An IGETC Area 1B course must have an English composition course as prerequisite. In courses in Area A3 of CSU GE-Breadth, English Language Communication and Critical Thinking, students will develop the ability to analyze, criticize, and advocate for ideas, to reason inductively and deductively; and to reach well-supported factual or judgmental conclusions.

[28] We replicated this analysis using students who took college composition courses in fall 2016 at the nine college that offered co-requisite models during that term and the results were the same.

We have established in previous work (Cuellar Mejia et al. 2016) that attrition rates are high among students who start college in developmental courses. It is important to highlight here that the comparison group of students who made it through developmental English is a subset of motivated students. For example, among first-time developmental English students in the fall 2016 term, only about half enrolled in a college composition course as of fall 2018. Co-requisite students, on the other hand, are an academically heterogeneous group who under the old placement system would have gone into developmental English courses. The findings suggest that co-requisite students did as well or better in subsequent coursework as did the motivated group of students who went through developmental English and made it through college composition, and that they did so in a shorter amount of time.

The next relevant comparison is between co-requisite students and students who started in college composition without support. As Figure 17 shows, co-requisite students are as likely (statistically) to enroll in a critical thinking course as students who started in college composition without support.[29] Their success rates in both college composition course and critical thinking are slightly lower (5 percentage points); that is to be expected, given the likelihood that co-requisite students have a wider range of preparedness than students enrolled in college composition without support.

As more data become available, it will be important to see whether co-requisite students are more likely to accumulate general education units beyond critical thinking compared to their remedial counterparts. This will help determine the extent to which increased access to transfer-level English clears the path toward degree attainment and transfer.

AB 705 Implementation Insights

Since AB 705 took effect in January 2018, colleges have done a tremendous amount of work to unpack the complexities this huge transition entails. The California Community Colleges Chancellor's Office, the Academic Senate for California Community Colleges, the California Acceleration Project, Cal-PASS Plus/Educational Results Partnership, and the RP Group have provided guidance to colleges as they prepared for full implementation of AB 705. In this section, we draw from our interviews with 19 colleges that broadened access via placement and co-requisite reforms to provide insight into issues and challenges that are likely to arise.

Accessing high school data

AB 705 mandates that colleges use high school records as the primary measure for math and English placement. Access to accurate information about students' high school performance is therefore critical. The colleges we interviewed accessed the data in various ways, ranging from data agreements with local high schools to using self-reported student data. Arguably the most accurate high school data is obtained from high school transcripts via data agreements with high schools or districts. However, research has shown that self-reported data is also reasonably accurate (Sanchez and Buddin 2016). Colleges that reported having participated in the Multiple Measures Assessment Project (MMAP) pilot indicated they accessed the data as part of their partnership with Cal-PASS Plus and their local school districts. Recognizing that not all student data can be captured through local data agreements and that some students may not be able to access their high school transcripts, the colleges we spoke to also gather self-reported high school grades, either through the CCCApply option that allows colleges to collect this information

[29] Among students who completed college composition in fall 2017 and did not enroll in a critical thinking course, about 65 percent were still enrolled in fall 2018. This percentage is the same across the three groups.

via the state's common application form, or with an online or written placement tool that asks students about their high school achievement (e.g., GPA, coursework, grades in most recent math or English course).[30]

More recently, a new statewide tool known as the Multiple Measures Placement Service (MMPS) [31] has been developed to help colleges determine math and English placement using Chancellor's Office default placement rules. The MMPS consolidates data from multiple sources, including self-reported data from CCCApply and official high school transcript data from the CCGI and Cal-PASS Plus, to generate placement information based on the AB 705 default placement rules (CCCCO Technology Center 2019). While this tool draws from multiple sources, there is still a gap, as K–12 data is only available if a school or district partners with Cal-PASS Plus; currently, only about 83 percent of students in the MIS data have matching high school records (Hayward et al. 2019). Efforts to support colleges as they implement AB 705 would greatly benefit from the creation of a longitudinal data system that links individual student records from K–12 through higher education.[32]

Messaging and communication

Faculty and administrators at colleges that broadened access to gatekeeper courses indicated that messaging and communication about placement policies and concurrent support courses is key to encouraging or discouraging enrollment in transfer-level math and English courses. Several faculty were enthusiastic about their colleges' efforts to inform students about the new placement policy and curricular support options via videos that included student testimonials. These informational videos were often used during the orientation process to help students make informed placement decisions. Colleges also reported using informed consent processes when students were considering a placement other than the one the college recommended. At Porterville College, for example, an informed consent process is being used for students with a GPA of less than 1.9 as of fall 2019. While the college's placement policies recommend that these students take college composition with co-requisite support, students have the option to enroll in the standalone freshman composition course instead. The informed consent form explains in greater detail what the concurrent support class is and why the college believes it will give students the best opportunity to succeed; by signing the form students acknowledge that they believe they can complete the course without support. Citrus College is also considering the use of an informed consent process in math to prevent students from enrolling in a developmental math course when they have access to a transfer-level math course. By signing the form, students would acknowledge that they are aware that enrolling in a developmental math course will delay progress toward their major.

Several faculty we spoke to highlighted the importance of counselors in the success of placement and curricular reforms. Counselors were often cited as one of the primary ways students learned about co-requisite courses and were sometimes the only way a student could register for the course. For example, during the pilot period of the enhanced English course at Fullerton College, students learned about the course during a group orientation session but had to request enrollment during a one-to-one meeting with a counselor. Several faculty noted that counselors were especially critical to the guided self-placement process: students were often encouraged to speak to a counselor about which course (with or without concurrent support) was the better fit based on prior academic performance and other variables. However, counselors do not always align their advice with the new placement policies. Faculty spoke of instances where counselors were overriding GPA placements to allow students to enroll

[30] CCCApply, the statewide online admission application center for California Community Colleges, combines individual college identity and processing with system-wide consistency, compliance, and support.

[31] MMPS is the result of statewide collaboration among the California Community Colleges Board of Governors, the Chancellor's Office, colleges across the system, and partners including California College Guidance Initiative (CCGI) and Educational Results Partnership. It is designed to support colleges in the implementation of AB 705. For more information, see https://ccctechcenter.org/projects/multiple-measures-placement-service.

[32] Assembly Bill 75, which was recently passed by the California legislature, moves these efforts closer to reality by funding a process for the development of a statewide educational data system.

in a lower-level course. One faculty noted that if counselors sensed even a bit of hesitation from students about going into the transfer-level course, they often encouraged students to take a developmental course. Students who lack academic self-confidence—many of whom are from historically underrepresented groups—may be adversely affected by messaging and communication during the placement process, so it will be important to monitor counselor recommendations to ensure equitable placement.

Faculty professional development

Professional development remains critical in ensuring the success of curricular reforms. Math and English faculty overwhelmingly agreed that communities of practice[33] and participation in CAP training activities[34] were among the most valuable supports as they began teaching co-requisite courses. Communities of practice were often used to train faculty in new pedagogy and curricular practices (e.g., the instructional cycle, supporting reading, and the affective domain). At Skyline College, where nearly all students are now enrolling in a college composition course, with or without support, the community of practice was especially important in training faculty to address the affective domain, help students develop college navigation skills, and introduce themes such as "resilience" into the curriculum. Given the increasing diversity of academic skills of students going into transfer-level English courses, faculty found that meetings throughout the semester provided ongoing support and allowed them to "brainstorm how to address struggling students."

Professional development was also seen as key in addressing equity in the classroom. Faculty noted that discussions about disaggregated classroom data helped highlight issues that may have been invisible previously. One faculty member described going through the language in the syllabus to question the reasoning behind policies and ask if there are "groups that would be unfairly affected." This process included the identification of possible biases in attendance or lateness policies that may disproportionately affect students with work or family responsibilities or those who rely on public transportation. Several faculty also mentioned the support provided by organizations such as Luke Wood and the Center for Organizational Responsibility and Advancement (CORA); these organizations focus on teaching men of color and incorporating equity-minded principles into the classroom.

Guided self-placement

According to faculty and staff we interviewed about reforms in English, nine of the sixteen colleges currently use or are adopting a guided self-placement (GSP) approach in addition to or instead of multiple measures.[35] As part of a GSP process, a college may provide students with course information (course descriptions) and questions intended to help them assess their preparedness to read and write at a certain level (e.g., "Can you read 50 pages between classes?"). The GSP process is meant to help students select courses that align with their educational goals and abilities (Academic Senate for CCC 2018). GSP is an attractive option for older adults who have been out of school for many years and students who attended foreign high schools. Some colleges are also using GSP to help students select course options. While GSP has been called the most socially just form of placement (Toth 2018) because it assumes that students are autonomous and can honestly determine their skill levels, it may also

[33] Communities of practice are formed by people who engage in a process of collective learning in a shared domain.

[34] CAP's training activities include a Community of Practice (COP) and Leadership Training. The COP is an intensive three-day institute for faculty. It includes in-person workshops, ongoing coaching, access to rich instructional materials, and the chance to learn from a statewide network of innovative faculty. CAP's Leadership Training is an advanced training program intended to support faculty graduates of the CAP community of practice to lead acceleration efforts on their own campuses, including providing professional development to their colleagues and developing new approaches to placement and remediation.

[35] None of the five colleges we spoke to about math indicated they planned or were currently using GSP. The only instances they noted math placement being akin to GSP was in having their placement process take a student's major into account to determine the appropriate math course (e.g., statistics, pre-calculus, liberal arts math). A recent AB 705 implementation survey conducted by the Multiple Measures Assessment Project (MMAP) finds that while only 27 percent of colleges currently report using GSP for students who do not have high school records in math and English, the majority of colleges report that they plan to use GSP during the 2019–20 academic year—76 percent in English and 72 percent in math (Multiple Measures Assessment Project 2019).

contribute to greater inequality because it relies on information that is often strongly linked to social and cultural capital. For example, a student's math anxiety might be provoked by sample college algebra or statistics problems. Concerns about equity led the CCCCO to provide guidelines on the development of GSP policies and practices, which prohibit the use of sample problems or assignments and request students to demonstrate skills through surveys or tests (Perez 2019).[36] It will be important for future research to evaluate the equity and effectiveness of GSP policies.

Concurrent support: enhanced model versus linked support course

Colleges that implement a concurrent support model have to decide whether to embed support in the college course via an enhanced model or offer linked support via a separate co-requisite course. Colleges that opted for the enhanced model noted that, "logistically it made more sense" for students to register for a single five-unit course than to register for two separate courses. They added that an enhanced course was "easier to explain and market to students" and that "confusing course descriptions" can make co-requisites look like standalone courses. Indeed, some faculty at colleges using the co-requisite linked model indicated that one of their biggest challenges was related to having students enroll in two separate courses. We learned that students often end up registered in the transfer-level section but not the linked support course—and, as a result, they were dropped from the course. Still, faculty at these colleges agreed that once the registration challenges were overcome, students often experienced these linked courses as a single course because they were often taught back-to-back and by the same instructor. Ultimately, one of the main differences between the standalone college-level course and the supported course was the opportunity to have "more time" to receive necessary "just-in-time" remediation and other academic and non-academic support.

Colleges that are implementing or planning to implement an enhanced course need to make sure the course is properly articulated for transfer credit. As we noted previously, Fullerton College piloted an enhanced course by offering some sections of standard college composition as enhanced courses (or shadow courses)—however, this probably limited enrollment and meant that not all students who could have benefited from concurrent support received it. Importantly, enhanced courses in Skyline, San Mateo and Fullerton all secured IGETC articulation. Transfer articulation for enhanced courses surfaced only in English in our analysis, primarily because our sample of math colleges did not use this approach. However, in the future, math departments that decide to implement the enhanced course structure will need to secure transfer articulation early on to ensure that all students who can benefit from the course are able to enroll and get the appropriate credit.

Academic support and nonacademic student services

More students are taking transfer-level math and English courses than ever before. As a result, these courses are increasingly heterogeneous with respect to race/ethnicity, academic preparation, and other factors. Colleges have had to strengthen student services and academic support both in and out of the classroom. Some colleges indicated that they are using their writing centers or instituting an extra lab requirement for students who need higher levels of academic support. Embedded tutors or supplemental instructors are relatively common among the colleges we interviewed: in English, nine of sixteen colleges indicated that they were currently using or planned to use embedded tutors or supplemental instructors in concurrent support courses; in math, one of the five

[36] Districts must also follow Title 5 §55522 in the development of a guided placement method. In addition, the CCCCO will require colleges who opt to develop a GSP policy to collect and report data to demonstrate that students benefit from the GSP policy being implemented. The data will need to include throughput and pass rates as well as course placements results disaggregated by race/ethnicity (e.g., the number of students assessed, placed into different curricular options in math and English). While districts will have two years to validate the GSP policy, colleges will be required to provide a preliminary report after the first year of implementation and must submit a detailed description of the GSP methods implemented no later than July 1, 2019. For more information, see "AB 705 Guided and Self Placement Guidance and Adoption Plan Instructions" (Perez 2019).

colleges indicated the same. One English faculty member noted that embedding a tutor in the classroom helps counteract the stigma that is sometimes associated with getting this kind of help. In fact, a Citrus College student survey found that "students who would have never set foot in the writing center" were more likely to use those services after working with an embedded tutor.

Colleges also spoke of implementing holistic student support. A holistic approach acknowledges that some classroom challenges are attributable to non-academic factors, such as family or work obligations and food or housing insecurity. This happened, for example, by having a food pantry to address student hunger or by having a SparkPoint center to help bundle services that address issues that arise from rising economic inequality, such as access to housing and childcare. At Skyline College, this support includes helping students determine whether they are eligible for public benefits, helping students apply for benefits, and assisting students with financial education (Stanback-Stroud n.d.). The San Mateo Community College District is implementing a Promise Scholars program, which provides students who meet certain requirements with a waiver for full tuition and fees, a dedicated counselor, a book stipend, and a monthly stipend for food or gas.[37] Some co-requisite or enhanced courses are reserved for participants in programs (such as Promise Scholars) that offer holistic support.

Funding

In discussions about funding for curricular reforms and student support, faculty and staff were often referred to specific sources, including the Basic Skills Student Outcomes and Transformation (BSSOT) grant, Basic Skills Initiative (BSI) funding, and Student Equity and Achievement (SEA) funding. Most faculty we spoke to indicated that BSSOT funding was critical. This initiative awarded $90 million to 64 colleges in the CCC during the 2016–17 academic year to support the implementation or expansion of "evidence-based innovations and redesign in the areas of assessment, student services, and instruction in order to improve the progression of basic skills students from remedial education to college-level instruction" (Perez 2018). BSSOT grant funding was said to be especially critical in the areas of professional development and embedded tutors. While not all colleges compensated faculty for their participation in professional development, several noted that the ability to provide stipends was "powerful," especially in relation to part-time faculty, a large group in math and English departments. Faculty at colleges that were using BSSOT grants to pay for embedded tutors expressed uncertainty about how they would be able to support those activities now that the grants were ending. Several faculty mentioned that they hoped their colleges would institutionalize support for curricular reforms and student supports, while others anticipated that SEA or guided pathways funding could be used.

Alignment with Guided Pathways

There was widespread agreement among interviewees that the reforms brought about by AB 705 are critical to the success of Guided Pathways. Math faculty indicated that the alignment of math requirements with programs of study will help "eliminate frustrations and unnecessary challenges"—by not requiring intermediate algebra if a student is not a business or STEM major, for example. The alignment between AB 705 and Guided Pathways also emerged in reference to factoring intended majors into the placement process. Previously, heavy reliance on placement tests led to many students being placed in an algebra-based pathway. Now colleges can advise students to take the math course that is best aligned with their educational goals.

In English, faculty highlighted the alignment between the initiatives in reference to the efficiencies created by restructuring the developmental sequence and the use of more holistic supports. Specifically, faculty noted that

[37] The Promise Scholars Program is a replication of the City University of New York's (CUNY) Accelerated Study in Associate Programs (ASAP). To qualify for the program, students must be California residents, first-time college students, enrolled full-time, attend regular meetings with Promise Scholars counselors, complete a student educational plan and submit the FAFSA or Dream Act application. See the Promise Scholars website for more information.

remediation reform and greater access to transfer-level courses allows students to create program maps and reach educational goals more quickly. One faculty member said that the two reforms "fit perfectly": completion of transfer-level math and English in a year will be better facilitated by AB 705 reform, whereas "before this it would be impossible." It must also be noted that several English faculty also indicated that the alignment between the initiatives was unclear or could be strengthened. One faculty member indicated this lack of clarity emerged because the "meta-major" language is not used in English departments.[38] Still, some faculty viewed this same issue as an opportunity whereby college composition courses could be contextualized for the different meta-majors.

Conclusion and Recommendations

Expanded access to transfer-level math and English courses through placement and curricular reforms dramatically increases the chances that students of all racial/ethnic groups will successfully complete these courses. This report should offer some reassurance that the potential benefits for students are real and sizeable. College officials, faculty, the Chancellor's Office, the Academic Senate, researchers, and others will continue to have a key role moving forward to ensure that all students, regardless of their background, have the best chances of succeeding. With this in mind, we offer the following recommendations.

Equity should be at the heart of reforms. This study provides evidence that improving outcomes of historically underrepresented students is central to the overall success of AB 705. However, it is clear that curricular and placement reform do not address persistent gaps in isolation. Colleges across the state are adopting a number of strategies to reduce persistent racial/ethnic gaps. These include incorporating culturally relevant pedagogy and addressing the affective learning domain in the classroom; using designated funding to support faculty engagement in communities of practice; and adopting data-driven equity-minded practices and policies. Additionally, faculty spoke of addressing equity by incorporating more holistic supports that address the non-academic challenges that affect students' in-class performance, including their economic and mental health and nutritional needs.

More progress is needed, especially in math. Impressive changes are occurring in English; in math, however, relatively few colleges had adopted substantive placement reforms and fewer still were offering co-requisite reforms at scale as of fall 2018. Although math reforms might be more complicated, the experience of colleges that broadened access prior to the AB 705 deadline should serve as an example. In particular, ensuring that students have access to the appropriate math pathway, which for many students is statistics, is critical to scaling up the reforms. Professional development is also needed to ensure that colleges have faculty equipped to teach statistics pathways.

More research is needed to determine which co-requisites work best. The majority of colleges in the system will implement co-requisite support courses as their main strategy to help students to succeed under the new placement system. This study provides evidence that co-requisites are instrumental in spurring student success. However, we saw variation in outcomes across colleges, so it is important to determine whether some characteristics (e.g., pedagogy and instruction, unit load, use of online instruction, just-in-time remediation, mandatory support services, early alert systems, embedded tutors, eligibility criteria) are more effective than others.

[38] Meta-majors are a key element in the Guided Pathways framework. They are used to describe the groupings colleges use to organize programs or majors that have related courses. Some examples of meta-majors include arts, humanities and communication; business; education; social and behavioral science; and STEM. For more information see: https://ccrc.tc.columbia.edu/media/k2/attachments/guided-pathways-part-1-theory-practice.pdf.

Co-requisites help, but struggling students may need additional support. In addition to offering co-requisite support, some colleges are adjusting and expanding academic and non-academic supports that they already have in place and adopting more holistic supports. Differences across colleges in the adoption of additional supports may be partly responsible for the variation in student outcomes that we are seeing. The impact of increasing access to learning centers, supplemental instruction, directed learning activities, embedded tutoring, SparkPoint centers, food pantries, Promise Scholars programs, and Guided Pathways initiatives should be accounted for and evaluated.

Standalone remedial offerings should be monitored. Some colleges are deciding to continue offering developmental course sections to serve students who have been out of school for more than 10 years, English Learners, students with disabilities, and students who place themselves below transfer level. While it may seem reasonable to provide standalone remediation for these groups, there is a significant risk that many students who could have been successful in transfer-level courses could end up in developmental sections. Colleges should closely monitor their data to see who is enrolling in developmental courses and whether these courses are serving their intended purpose.

Ensure accountability and provide ongoing support to colleges. The Chancellor's Office, the CCC Board of Governors (BOG), and independent research organizations should assess systemwide compliance with the new law and ensure transparency and accountability. CCCCO monitoring can take many forms, including having colleges submit guided self-placement implementation plans, publishing key student success metrics for all colleges, and tying funding for certain initiatives (e.g., Student Centered Funding Formula, SEA funding, Guided Pathways funding) to compliance and student outcomes (e.g., math and English throughput). The CCC Board of Governors will also play a key role in ensuring accountability for AB 705, given that the bill authorizes them to establish regulations governing the use of measures, instruments, and placement models to maximize the probability that students enter and complete transfer-level math and English within one year. Additionally, the CCCCO and BOG can work with independent research organizations to conduct studies on early implementation that can identify policy adjustments that might be needed. More importantly, these institutions, along with community college professional organizations, like CAP, the Academic Senate, and the CCC Assessment Association, among others, will play a crucial role in providing ongoing support to colleges, especially to those struggling to implement these reforms successfully.

This study provides an early look at the kinds of results that we can expect to see after all colleges are fully on board with AB 705. But it is important to remember that the AB 705 implementation deadline is not the end of the road. Colleges should continue to learn from their own experiences as well as from other colleges. AB 705 is a dramatic change and colleges need to continue working on fine-tuning their placement policies, course offerings, and support services in order to offer students the best chance of succeeding. More generally, data collection and sharing, research, and evaluation are fundamental to the success of placement and curricular reform. AB 705 has the potential to be a game changer, affecting student trajectories well beyond transfer-level courses, and PPIC is committed to evaluating its long-term impact.

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