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Remedial Education Reforms at California's Community Colleges

Early Evidence on Placement and Curricular Reforms

SUMMARY

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

Each year about a quarter million students enroll for the first time in English and math courses in California's community colleges. The vast majority of these students are placed in developmental (or remedial) courses from which relatively few emerge and go on to achieve their educational goals. Indeed, most never complete a transfer-level course in English or math. Seeking to improve student outcomes, a few colleges have been experimenting with either placement reform and/or with reforms to the curricula and course structure of their developmental education offerings, but not at the scale that is needed to see systemwide improvements. The passage of Assembly Bill 705 broadened the scope and accelerated the pace of change: new reforms, to be fully implemented in fall 2019, hold the potential to dramatically transform this record of failure. These reforms will change the assessment and placement of incoming students in English and math, shifting the focus from standardized tests to high school records (an approach known as multiple measures). Full implementation of AB 705 most likely will result in colleges placing the majority of their entering students in transfer-level courses. Additional curricular redesign efforts, including co-curricular support, are intended to further improve the likelihood of success, especially among students with the lowest high school performance levels. Many colleges are expected to provide co-requisite courses—pairing the transfer-level course with a support course—for students who need additional support to pass college-level courses in English and math.

By looking at early implementers of these reforms, this study is the first to provide a comprehensive examination of multiple measures placement and co-requisite remediation in California community colleges. As all colleges move toward compliance with AB 705, this study sheds light on what colleges can expect to see in terms of both student outcomes and implementation challenges. As of the 2016–17 academic year, we find that the early implementation of these reforms has been more common in English than in math, and that most colleges have not yet implemented the reforms at full scale. Even so, at early implementer colleges reforms seem to be accomplishing most of their goals:

- Colleges that have implemented the reforms have seen substantial gains in student access to transfer-level courses and commensurate declines in enrollment in developmental education.
- As substantially more students enter transfer-level courses, course success rates have remained relatively stable and throughput—the share of students completing a transfer-level course—has increased.
- Increases in completion of transfer-level courses have occurred for every demographic group, but equity gaps remain.

- The magnitude of the improvements varies across colleges, but every college that implemented placement reforms saw notable increases in throughput.

As colleges across the state adopt and scale placement and developmental education reforms to comply with the requirements of AB 705, they will need to focus on narrowing equity gaps, supporting professional development, providing students with an effective support structure, and taking the necessary steps to accommodate a growing number of entering students enrolling directly in transfer-level courses. State leaders and CCC, UC, and CSU officials will need to work together to plan for a likely increase in the number of community college students who are transfer-eligible.

The early results of placement and curricular reforms show great promise, but rigorous research will be needed to track their long-term impact once they have been implemented statewide.

Introduction

With the passage of Assembly Bill 705 in October 2017, California community colleges are in the midst of a major transformation of developmental education. The bill requires community colleges to maximize the probability that students will enter and complete transfer-level coursework in English and mathematics/quantitative reasoning within a one-year time frame.[1] Relatedly, it mandates that colleges use high school records (e.g., coursework, grades, and/or grade point averages) as the primary criteria for placement recommendations. This is a significant move, as community colleges have primarily relied on standardized placement tests to determine which math and English courses students should take, and have required students deemed unprepared for college-level coursework to take long sequences of developmental courses (Rodriguez, Cuellar Mejia, and Johnson 2016). While AB 705 focuses mainly on changes to assessment and placement, it will also lead to significant curricular reforms.

California did not get to this point overnight.[2] Ten years ago, compelling research evidence began to raise serious questions about the effectiveness of typical assessment and placement practices and about the curriculum, delivery, and structure of developmental education. Studies have shown that standardized tests are not the most accurate measure of student ability—particularly when used as the sole measure for placement. These tests often place students in developmental education who could actually succeed in college-level courses (Scott-Clayton 2012; Scott-Clayton, Crosta, and Belfield 2014; Willett 2013). Research has also shown that placement decisions have profound effects on students' trajectories and on the likelihood that they will achieve their academic goals (Hern and Snell 2010; Bailey, Jeong, and Cho 2010; Cuellar Mejia, Rodriguez, and Johnson 2016). Our own research in California found that only 27 percent of students who took at least one developmental math course and 44 percent of those who took developmental English completed a college-level course in the same subject. Furthermore, we found that only 24 percent of students who enrolled in developmental coursework transferred to a four-year college after six years, compared to 65 percent of those who were deemed college ready (Cuellar Mejia, Rodriguez, and Johnson 2016).

This body of research, combined with growing interest in improving college completion, has led to reform efforts around the nation. Two types of reforms emerged to address concerns about poor outcomes of students placed in remediation. The first type aimed to promote more consistent and accurate assessment and placement policies through the use of multiple measures (including high school records). A second set of reforms aimed to minimize attrition and accelerate students' progress into transfer-level courses, with co-requisite remediation emerging as a promising approach. In our state, the work of organizations such as the California Acceleration Project (CAP), the Multiple Measures Assessment Project (MMAP), and the Campaign for College Opportunity, together with the California Community Colleges Chancellor's Office (CCCCO), elevated the need for systemic reform.[3]

Although a group of California community colleges have been experimenting with developmental education reform—including multiple measures placement, one-semester accelerated developmental English courses,

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[1] In this report, when we talk about transfer-level courses we are referring to the lowest-level English and math courses that are transferable to the University of California (UC) and/or to the California State University (CSU) systems on the basis of articulation agreements. These courses are also known as gateway courses. For English only the first transfer-level composition course (C-ID ENGL 100) qualifies as the gateway course. Considering that colleges' math requirements vary according to the student's program of study, any transferable math course—including introductory statistics, trigonometry, college algebra, and pre-calculus—qualifies as a gateway course. Throughout the report we use the terms transfer-level and college-level interchangeably.

[2] Indeed, even though AB 705 is arguably the most important legislation intended to improve developmental education, it is certainly not the first. 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.

[3] MMAP is 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. CAP is a statewide faculty-led professional network that supports CCCs in transforming developmental education to increase student completion and equity.

statistics pathways, and co-requisite remediation—for some time now, these reforms have benefited only a small fraction of the students who could potentially take advantage of them (Rodriguez et al. 2017; Cuellar Mejia et al. 2018). With few exceptions (Cuyamaca College, for example), reform efforts have stayed on the periphery as "pilots" and "experiments"; for a variety of reasons, colleges have been reluctant to jettison the traditional approach. Research has identified a "tendency for colleges to adopt minimally disruptive, small-scale approaches, which lack the breadth and depth to substantially improve college-wide student outcomes" (Edgecombe et al 2013). In addition to faculty and staff resistance, other challenges—including scheduling, advising, registration, and technical problems—have made it difficult to scale up these reforms. The hope is that AB 705 will supply the leverage needed to implement these reforms at scale and dramatically improve the completion of transfer-level math and English courses.

With this in mind, this report aims to provide a comprehensive examination of developmental education reform efforts prior to AB 705 requirements. As we move from voluntary pockets of reform to wholesale mandated adoption, it will become a critical baseline for future examinations on the effectiveness of AB 705. Also, this report will shed some light on both the potential gains in student outcomes and the challenges that colleges could face as they move toward compliance with AB 705. We start by providing some context for developmental education reform. Then we identify early implementers of multiple measures and co-requisite remediation among the state community colleges and describe how these reforms have affected the share of students able to enroll directly in transfer-level courses and the overall share of students completing these courses within a one-year time frame. Next, we incorporate key themes that emerged from semi-structured interviews with faculty and staff at colleges that have implemented reforms.[4] We conclude by summarizing some important considerations for both community colleges and state officials as they move forward with AB 705 implementation.

The Changing Landscape of Assessment and Placement

Colleges in California and across the country have traditionally relied on standardized placement exams to assess the math and English skills of incoming students (Fields and Parsad, 2012; Hughes and Scott-Clayton 2011; Rodriguez et al. 2016). Yet research has found that commonly used placement tests are not strongly predictive of student success in college-level courses. These tests tend to under-place students, placing them in developmental education sequences when they could have actually succeed in college-level courses. For example, Scott-Clayton, Crosta and Belfield (2014) found that roughly one in four test-takers in math and one in three test-takers in English were severely misplaced, with under-placements to remedial courses much more common than over-placements to college-level coursework. Recent research from California and other states shows that high school grades and other student achievement data do a better job of predicting success in college-level courses (Bahr et al. 2017; Hodara and Cox 2016; Multiple Measures Assessment Project 2015, 2016; Ngo et al. 2013; Scott-Clayton 2012; Scott-Clayton, Crosta, and Belfield 2014; Willett 2013).

[4] In spring 2018, we interviewed 31 individuals—21 faculty (10 math and 11 English) and 10 staff (assessment, counseling, and institutional research) at 16 community colleges across the state. The colleges that we interviewed were among the colleges with increases of 10 percentage points or more in the share of first-time math/English students starting directly in transfer-level. All the colleges that we interviewed were either offering co-requisite models or using multiple measures placement (we talked with 9 of the 10 colleges that offered co-requisite models in 2016-17). See Technical Appendix A for more details on our methods and analysis. It is important to note that because the faculty we interviewed teach at colleges that have voluntarily implemented reforms, they are much more likely than the majority of faculty in the California Community College system to view current reform efforts favorably. Indeed, we have already noted that faculty resistance was arguably one of the main reasons for the small-scale implementation of substantial changes to placement policies and developmental course offerings before AB 705 was enacted.

Partly driven by the questions raised by these studies, colleges around the nation have begun to use multiple measures to assess students' readiness for college-level courses. A recent national survey found that between 2011 and 2016, the number of two-year colleges using multiple measures more than doubled in both math (from 27% to 57%) and reading/writing (from 19% to 51%) (Zachry Rutschow and Mayer 2018).

However, there is substantial variation in the measures being used and how colleges are using them. Measures in use include high school cumulative grade point average (GPA), highest level of coursework completed in a subject area and corresponding course grade, results from the Early Assessment Program (EAP), recommendations from counselors or instructors, and noncognitive assessments (Rodriguez et al, 2016).[5] Approaches to multiple measures placement include the disjunctive approach, under which colleges provide multiple ways for students to qualify for a transfer-level course, such as through test scores *or* key high school measures, whichever is higher. There is also the compensatory approach, in which test scores and multiple measures are combined to arrive at a single placement recommendation. At many colleges using this approach, the most important factor continues to be standardized test scores—multiple measures (which add or subtract points to the standardized test score) often do not come into play unless a student's test score puts him/her on the margin. Finally, colleges can use a highly restrictive conjunctive approach, which requires agreement between the test and multiple measures (Willett, Gribbons & Hayward 2014).

Multiple Measures Placement in California Community Colleges

In theory, the use of other measures in addition to placement exams is mandated in Title 5 of the California Code of Regulations.[6] However, in practice test scores have dominated the placement process and other measures held little or no weight in placement decisions. Until recently, the compensatory approach to multiple measures was used by most California community colleges. Indeed, our previous research found that 30 percent of colleges used multiple measures only in response to a student's request or when students challenged their placement (Rodriguez et al. 2016). As colleges move toward AB 705 compliance, the disjunctive approach will become the default.

The Chancellor's Office, the Academic Senate for California Community colleges, the AB 705 Implementation Advisory Committee, and the MMAP research team have worked together to provide default, research-based, placement rules which can be used immediately for AB 705 compliance (Table 1). According to these guidelines, "all students who have graduated from high school within the past ten years and have a goal of transfer or degree attainment should be recommended to enroll directly into transfer-level courses in English, statistics/liberal arts math, and BSTEM-based math". The most recent MMAP research indicates that when compared to the attrition of traditional sequences, all students—even students with the lowest high school performance levels, students with disabilities, or EOPS students—are more likely to complete a transfer-level course within one year when placed directly there (especially if they receive appropriate support).

[5] Non-cognitive assessments gauge student skills in important areas (e.g., time-management, academic self-confidence, decision making, persistence, etc.), that are not captured by standardized assessments of academic skills.

[6] This mandate was a result of a Mexican American Legal Defense and Education Fund lawsuit over concerns that assessment tests disproportionately placed Latino students into lower-level courses (Academic Senate for California Community Colleges 2014).

TABLE 1

Chancellor's Office AB 705 default placement rules for English and math

High school performance metric	Recommended AB 705 placement	Throughput rates for students enrolling directly into transfer-level
ENGLISH		
GPA >=2.6	Transfer-level English composition *No additional academic and concurrent support required*	78.6%
GPA 1.9 to 2.6	Transfer-level English composition *Additional academic and concurrent support recommended*	57.7%
GPA <1.9	Transfer-level English composition *Additional academic and concurrent support strongly recommended*	42.6%
MATH		
GPA >=3.0	Transfer-level statistics/ liberal arts math *No additional academic and concurrent support required*	75%
GPA 2.3 to 2.9	Transfer-level statistics/ liberal arts math *Additional academic and concurrent support recommended*	50%
GPA < 2.3	Transfer-level statistics/ liberal arts math *Additional academic and concurrent support strongly recommended*	29%
GPA >=3.4 *or* GPA >=2.6 *and* enrolled in HS calculus	Transfer-level BSTEM math *No additional academic and concurrent support required*	75%
GPA <=2.6 *or* enrolled in HS pre-calculus	Transfer-level BSTEM math *Additional academic and concurrent support recommended*	53%
GPA <=2.6 and no HS pre-calculus	Transfer-level BSTEM math *Additional academic and concurrent support strongly recommended*	28%

SOURCE: Adapted from Hope (July 2018); for more information see the CCC Assessment and Placement Website.

NOTE: The B-STEM recommendations presumes completion of Intermediate Algebra/ Algebra 2 or higher-level course in high school.

It is important to note that AB 705 mandates that all colleges use high school records as the primary criteria for placement recommendations but does not require all colleges to follow the same cutoff rules. Colleges retain local control over their placement systems and may devise their own rules to meet the needs of their students. However, colleges must show with data that any departures from the default placement rules lead to higher throughput rates; and they will still need to honor students' rights to enroll in transfer-level courses unless it can be demonstrated that students are highly unlikely to succeed. The Chancellor's Office emphasizes that this flexibility creates "significant opportunities for local customization and innovation in the form, delivery and amount of concurrent support." As stated by the law (Title 5 55003(g)), colleges have no more than two years to validate their own innovations and ensure that the throughput rates for those innovations meet or exceed the average throughput rates of all students at similar levels of high school achievement. Colleges will need to innovate to determine how best to serve returning students who have been away from school for long periods (a sizable group in most community colleges). The Chancellor's Office recommends that students retroactively benefit from the new placement rules once colleges implement the changes needed for AB 705 compliance (Hope 2018).

A natural question at this point is whether or not AB 705 compliance means that all developmental education courses are going to disappear. The Chancellor's Office latest guidelines state that if a college has an acceleration model, with a prerequisite course for the transfer-level course, the college will need to (1) demonstrate that this

model serves students who are highly unlikely to succeed in the transfer-level course, and (2) show throughput rates that meet or exceed the ones highlighted in the default placement rules table.

Under AB 705, colleges that do not have access to official high school transcript data are encouraged to use self-reported data or guided placement to place students. Colleges can collect self-reported data via CCCApply.[7] MMAP's preliminary analyses shows a reasonable level of alignment of self-reported transcript data and actual transcripts.[8] The MMAP team suggests that the reliability of self-reported data can be improved by encouraging students to have transcripts on hand when they apply and noting that inaccurate information could invalidate their application (Haward and Hetts 2018).

California is not the only state that has enacted statewide multiple measures placement legislation with high school achievement measures as the primary metric. Colleges in the North Carolina Community College System have been required to use multiple measures for placement since 2016. Students with an unweighted GPA of 2.6 or higher who graduated from high school within five years of college enrollment can register for any transfer-level English or math course without taking the placement test. For students who do not meet the GPA benchmark, colleges can use ACT or SAT scores in specific subject areas to determine college readiness. Students who do not meet the GPA or ACT/SAT criteria must take the standardized placement tests (Kalamkarian, Raufman, and Edgecombe 2015; RFA 2016).

What we learned from early implementers

In our interviews with staff and faculty at colleges that have begun using multiple measures, we frequently heard that MMAP presentations during the planning phases were useful in getting faculty and staff on board with the changes to placement policies. Several of the colleges we spoke to also reported using MMAP rules for placing students into transfer-level math and English courses (3.0 GPA for statistics and 2.6 GPA for English). However, a few colleges set GPA cutoffs that are slightly lower or higher. In English, for example, one college set a 2.5 GPA cutoff, while another chose a 3.0 GPA. In math, two colleges reported using a 2.8 GPA cutoff for placement into transfer-level statistics. Most colleges also reported taking a disjunctive approach—using whichever measure results in the highest possible placement. In all but one case, colleges reported that high school records generated the highest placements. One college's locally developed math test resulted in higher math placement for more than 40 percent of its students.

Many also believe it is essential to incorporate students' programs of study into the math assessment and placement process. At one college, self-reported multiple measures information—including high school GPA, highest level of coursework completed in math and corresponding course grade, time since last math class, and major—was gathered during the Accuplacer testing session, and then used to make placement recommendations in either a STEM-math or statistics pathway. This led to the development of an online tool that provides automated placement recommendations—offering timely information to students who often do not meet with counselors to discuss their options. At another college, students get various placement recommendations, each based on a different program of study. For example a student might be placed in both transfer-level statistics and intermediate algebra—the decision about which course to take would be based on whether that student is interested in pursuing a liberal arts or STEM major.

After incorporating the use of high school records into the assessment process, all of our interviewees reported experiencing increases in direct placements into transfer-level math and English courses and subsequent gains in

[7] According to MMAP, more than 70 colleges are already collecting self-reported data through CCCApply, which is an open application.
[8] A correlation coefficient of 0.75.

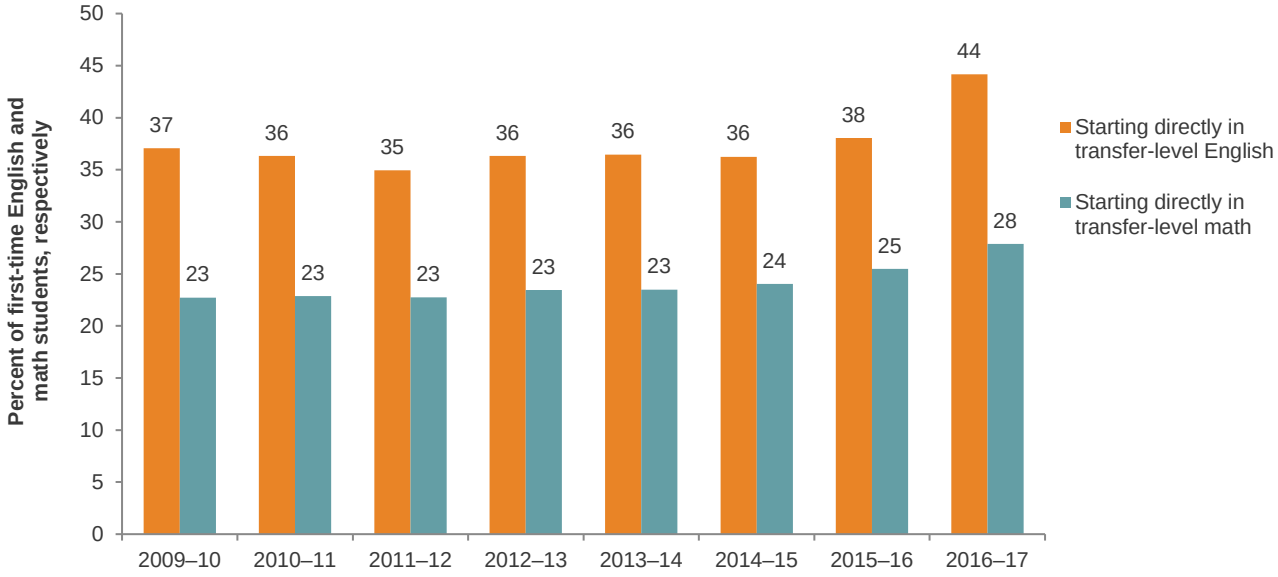
throughput rates. In the next section, we will see how changes to placement policies among early implementers resulted in changes in access to and completion of transfer-level math and English courses.

Early Evidence That Placement Reforms Are Accomplishing Their Goals

More than half of colleges systemwide have either implemented or are in the process of implementing policies that incorporate high school records as central criteria for English and/or math placement.[9] Overall, we find that placement reforms are more widespread in English than in math (69 versus 59 colleges). The scale and scope of these new policies has varied across the colleges, and implementation has even varied within colleges engaged in reforms. Consistent with these changes, we see systemwide increases in the number and share of first-time English and math students enrolling directly in college-level courses.[10] In 2016–17 (the latest year for which data is available) about 240,000 students enrolled for the first time in an English course; of those students, 44 percent started directly in college composition, up from 38 percent a year earlier. That same year, there were about 260,000 first-time math students; the share of these students going directly in transfer-level math also increased, but to a lesser degree, from 25 percent to 28 percent (Figure 1).

FIGURE 1

Access to transfer-level courses has expanded more rapidly in English than in math



SOURCE: Authors' analysis of COMIS data.

NOTE: Based on first-time enrollment in English and math courses.

It is safe to assume that at any given college, an annual increase of more than 10 percentage points in the share of first-time English/math students going directly into a transfer-level course is, in most cases, a response to changes in

[9] To determine the number of colleges implementing multiple measure (MM) reform during the 2016− 17 academic year, we analyzed a variety of documents: (1) applications for the Basic Skills Student Outcomes and Transformation (BSSOT) grants that provided funding to colleges implementing MM reforms; (2) list of colleges identified by the California Acceleration Project (CAP) as implementing MM reforms; (3) CAP 2017 community of practice applications indicating whether a college was implementing MM reform; (4) the Multiple Measures Assessment Project 2017 pilot colleges outcomes brief; and (5) interviews with community college faculty and staff (see Technical Appendix A).

[10] We created cohorts of students based on the term in which they took their first English (math) course anywhere in the CCC system. They don't need to be first-time students in that term.

placement policies and/or curricular design—implementation of multiple measures, co-requisite remediation, or both.[11] But colleges that implemented multiple measures at some point in 2016–17 may have seen little or no increase—either because they set their GPA cut-offs too high or because they had implementation challenges.

Only seven colleges registered an increase of 10 percentage points or more in the share of first-time math students going directly in transfer-level math in 2016–17. Three of those colleges—Siskiyous, Cuyamaca, and Los Medanos—had increases of 20 percentage points or more; with the majority of students now starting in a transfer-level math course (Technical Appendix B, Table 1).[12] All three have made substantive reforms in assessment and placement by systematically using high school records for placement. Both Cuyamaca and Los Medanos have also implemented self-reported GPA cut-offs that are lower than the MMAP cutoff for placement into transfer-level statistics (e.g., 2.8 vs. 3.0 GPA). Cuyamaca and Los Medanos colleges further broadened access to transfer-level math by using co-requisite courses. Siskiyous implemented a slightly different model, providing additional instruction and support for math student by lowering the lecture units in their elementary statistic course and increasing the lab units. During lab time, all students receive the extra support and tutoring.

Given that English placement reforms are more widespread, it is not surprising to see more colleges with annual increases of more than 10 percentage points in the share of students starting directly in transfer-level English (Technical Appendix B, Table 2)—21 colleges, to be exact. Twelve had increases of more than 20 percentage points. San Mateo, Solano, West Hills-Coalinga, Las Positas, and Skyline colleges registered the most dramatic increases in access to transfer-level English; these changes meant that at least two-thirds of their first-time English students started directly in college composition. With the exception of West Hills-Coalinga, these colleges are using self-reported GPA rules that are aligned with the MMAP recommendations. Skyline and Solano have further broadened access to transfer-level English by allowing students deemed unprepared to enroll in college composition with support (co-requisite remediation). West Hills-Coalinga, which won't start using multiple measures for English placement until fall 2018, has made all of its gains through co-requisite remediation.

Of course, placing more students directly in transfer-level English and math courses is not an improvement unless those students succeed in those classes. Ideally, we would assess the success of the new policies by comparing the outcomes of students who received a "multiple measure boost" with the outcomes of students who would have been deemed prepared for the transfer-level course under the old rules.[13] Unfortunately, we do not have access to assessment and placement information. However, we can track success rates in transfer-level courses as more students gain access to them. We find that in the colleges with the largest increases in access to transfer-level courses, student success rates in those courses held relatively steady. This is true for both math and English.[14]

Most importantly, we find that colleges that have implemented substantial changes in assessment and placement have also experienced substantial gains in one-year throughput rates. Most of the colleges with large increases in the share of first-time math/English students enrolling directly in transfer-level also experienced increases in throughput rates. In Table 2 we want to highlight the group of colleges that (1) reported an annual increase of 10 percentage points or more in the share of first-time math/English students enrolling directly in transfer-level in 2016–17; (1) saw increases in throughput; (3) had a throughput rate higher than 50 percent; and (4) used robust

[11] An assumption we confirmed in our interviews with colleges that experienced the largest increases in direct enrollment in college-level courses. However, we did identify two colleges (L.A. trade-Tech and West L.A.) that saw increases of more than 20 percentage points in direct access to transfer-level English even though we do not have knowledge of these colleges using multiple measures placement or co-requisite courses as of fall 2016.

[12] Among the remaining colleges, 71 colleges registered gains in direct enrollment in transfer-level math were modest at best, averaging 2 percentage points, while 36 colleges experienced either no changes or decreases.

[13] Students who received a multiple measures boost are those who would have been placed into developmental education if test scores alone were considered.

[14] We tested to see if there was a statistically significant change in success rates after fall 2016 and we did not find evidence to reject the hypothesis of no change. Transfer-level courses success rates varied quite a bit from term to term but we did not find evidence that this variation vas correlated with changes in the share of first-time math/English students given direct access to transfer-level courses. See Technical Appendix B for more details.

multiple measures and/or offered co-requisite models (which we will describe in the next section). For example, at College of the Siskiyous the share of first-time math students enrolling directly in transfer-level math increased from 16 percent of in 2015 to 67 percent in 2016 (by 51 percentage points), while the share of first-time math students successfully completing a transfer-level math course increased from 22 percent for the fall 2015 cohort to 58 percent for the fall 2016 cohort (by 36 percentage points). Other colleges with strong increases in direct access to transfer-level math —Cuyamaca, Los Medanos, and Canyons—also had substantial gains. In English, West Hills-Coalinga had the largest increase in both direct access to transfer-level English (from 32% of first-time students in fall 2015 to 64% in fall 2016) and in throughput rates (from 43% to 58%), while the College of San Mateo had a similar increase in direct access to transfer-level English (from 39% to 77%) but a less dramatic increase in throughput rates (from 62% to 68%). At College of San Mateo the increase in throughput rates was more modest because many students who started in fall 2015 in developmental English were able to complete transfer English within one year. However, the students who enrolled in 2016 were spared a full semester of course work, which enabled them to accumulate more transfer-level credits. This underlines the importance of considering the effect of these reforms not just on throughput, but also student time and costs.

TABLE 2

Early implementers saw major gains in access to and throughput in transfer-level courses

	Share of first-time English/math students starting directly in transfer-level English/math (%), 2016–17	Increase from prior year (percentage points)	Throughput rates (%), fall 2016	Increase from prior year (percentage points)
ENGLISH				
San Mateo	77	38	68	6
Solano	70	34	64	10
Las Positas	73	32	74	1
West Hills-Coalinga	64	32	58	15
Skyline	82	28	68	0
Santa Ana	75	27	51	1
Mt. San Jacinto	50	26	57	9
Porterville	36	23	52	16
Cuyamaca	52	19	57	4
Canada	69	15	60	4
Moreno Valley	37	15	51	5
Irvine Valley	51	14	67	13
San Diego Mesa	47	13	58	9
San Diego Miramar	46	11	54	11
Statewide	**44**	**6**	**51**	**1**
MATH				
Siskiyous	67	51	58	36

	Share of first-time English/math students starting directly in transfer-level English/math (%), 2016–17	Increase from prior year (percentage points)	Throughput rates (%), fall 2016	Increase from prior year (percentage points)
Cuyamaca	57	31	57	19
Los Medanos	56	20	51	9
College of the Canyons	41	18	44	9
Statewide	**28**	**2**	**28**	**-2**

SOURCES: Authors' calculations using COMIS data.

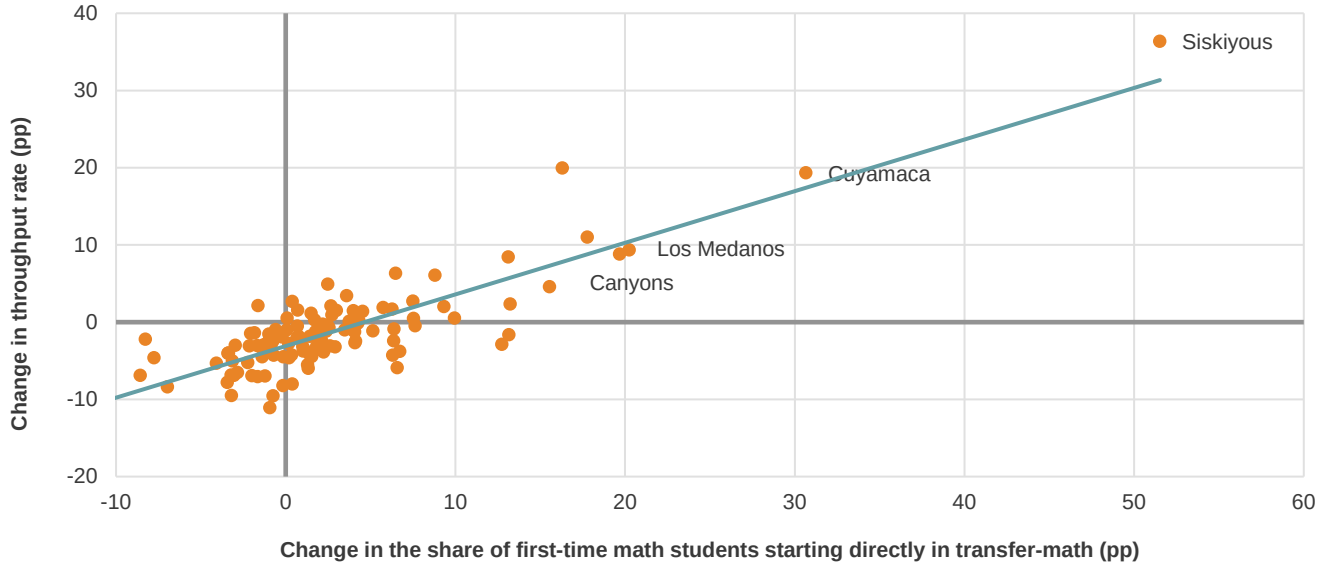
NOTES: We restricted our sample to students who started in transfer-level and took the course for the first time. To calculate throughput rates we restricted our sample to transfer-seeking students.

When we look across all colleges, the relationship between increases in access to transfer-level math (as measured by changes in the share of first-time math students enrolling directly in transfer-level math between fall 2015 and fall 2016) and changes in throughput rates (as measured by changes in the share of these students who successfully completed a transfer-level math course within one year of first enrolling in any math course) is strong and positive. (Figure 2). In English, throughput increases are similarly correlated with increases in direct access to the transfer-level course, but the relationship is not quite as strong as in math (Figure 3).[15] Consistent with our narrative so far, most of the colleges that stand out are the ones engaged in placement reforms. Early implementers used different curricular (e.g. co-requisite courses) and non-curricular supports (e.g. counseling, and mentoring) to amplify the effectiveness of their reforms to placement. The prevalence and effectiveness of those supports are other potential factors contributing to the relationship between increases in access to transfer-level courses and increases in throughput. Both figures below also show that the vast majority of colleges did not see significant changes in access to transfer-level courses or in throughput rates in 2016–17 relative to the prior year.

[15] It is important to note that this evidence is not sufficient to infer causality.

FIGURE 2

Increased access to transfer-level math is strongly linked to increases in throughput

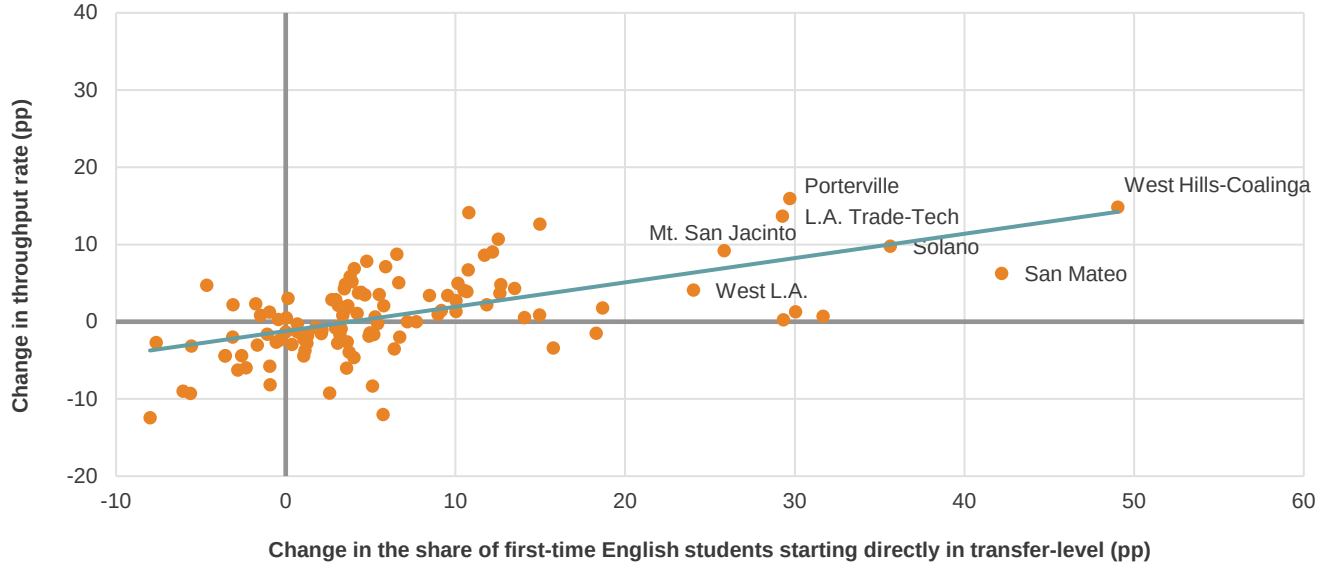


SOURCE: Authors' analysis of COMIS data.

NOTES: Throughput rates are the share of students completing transfer-level math within one year of first-time enrollment in any entry level math course (developmental or transfer-level). Changes are based on comparisons of one-year outcomes for the fall 2016 cohort compared to the fall 2015 cohort. We are highlighting colleges with the highest increases in the share of first-time math students going directly to transfer-level.

FIGURE 3

Increased access to transfer-level English lead to increases in throughput



SOURCE: Authors' analysis of COMIS data.

NOTES: Throughput rates are the share of students completing transfer-level English within one year of first-time enrollment in any entry level English course (developmental or transfer-level). Changes are based on comparisons of one-year outcomes for the fall 2016 cohort compared to the fall 2015 cohort. We are highlighting colleges with the highest increases in the share of first-time English students going directly to transfer-level.

The primary goal of providing broader access to transfer-level courses—and the main motivation behind AB 705—is to increase the share of students who complete those gatekeeper transfer-level courses in math and English and go on to attend and graduate from a four-year college. Research is beginning to show that successfully completing pathway-appropriate college-level math and college-level English in the first academic year- should lead to improved long-term success (Jenkins and Bailey 2017). Arguably, students who have successfully completed an introductory transfer-level course in English or math have cleared one of the largest obstacles faced along the pathway toward completion or transfer.

Several colleges that rose to the top in terms of access and throughput have also implemented co-requisite reforms in math and English or were planning to do so. As noted by the Chancellor's Office (Hope 2018), full implementation of AB 705 most likely will result in colleges placing the majority of their entering students in transfer-level courses. Additional curricular redesign efforts, including co-requisite courses, are intended to further improve the likelihood of success, especially among students with the lowest high school performance levels. We examine this reform in the next section. While not causal, the evidence presented in this section (and in the next one) provide a strong rationale for increasing access to transfer math/English through multiple measures placement and/or co-requisites.

A Closer Look at Some Early Implementers

College of the Siskiyous, a small rural college, implemented a curricular and placement reform that dramatically increased access to transfer-level math courses. Prior to fall 2016, the college primarily relied on a standardized test called Compass to assess student readiness for college-level math. Students deemed underprepared were placed in a multi-level algebra based sequence. After the reforms, utilizing the guidelines from the Multiple Measures Assessment Project, the college began using high school GPA and related placement measures to enroll students in a developmental math sequence aligned with their majors (STEM or non-STEM). The college also shortened the developmental math sequence for STEM majors to two-levels with embedded support in the classroom, and modified the College's statistics course for non-STEM majors to also include embedded support. These curricular changes, modeled after co-requisite courses, allowed all non-STEM majors to be placed in directly in to college-level statistics using multiple measures. College employees, including key faculty, drew on approaches highlighted in California Acceleration Project conferences to build their own model. A focus on student success and trust between administrators and new faculty leaders in math were central to the college's success.

Cuyamaca College transformed its assessment and placement policies as well as its math course offerings. Prior to fall 2016, the college primarily relied on the Accuplacer test to assess student readiness for college-level math. Students deemed underprepared were placed in a multi-level algebra-based sequence or a pre-statistics course. After the transformation, the college began to use high school performance records for placement. The college also eliminated all remediation below intermediate algebra and implemented co-requisite courses that are aligned with different programs of study (e.g., statistics, college algebra, pre-calculus and business calculus). With multiple measures and math pathways in place, one of the challenges Cuyamaca is trying to address is how to get students into the right math pathway based on their program interests. In spring 2017, faculty began to use the first days of class to inquire about students' career interests and transfer goals and make course adjustments based on this information. For example, a student enrolled in intermediate algebra might move to a transfer-level statistics course if he or she is pursuing a liberal arts major. In the future, the department would like to have STEM counselors available to work with students in the classroom as well as at the STEM Center to help place students in appropriate math courses.

Las Positas College significantly increased access to transfer-level English courses by changing placement policies. Prior to fall 2016, the college primarily relied on Accuplacer to assess student readiness for college-level English; students deemed underprepared were placed in a one-semester accelerated English course or a two-semester developmental English sequence. After the reforms, Las Positas began to place students using the best of either self-reported high school GPA (within 10 years of graduating) or test scores. Students self-reporting a GPA of 2.5 or higher receive a placement into transfer-level English. According to college officials, students placed using the GPA rules had equal or greater success rates than those placed using Accuplacer. In an effort to further accelerate student success and to be AB705 compliant, the college is planning to pilot co-requisite courses in 2019. One of the challenges the college continues to face is that the other college in their district has a higher GPA cut-off for placement into transfer-level English. This can pose challenges for students who are assessed at Las Positas and want to take transfer-level English at their sister college.

Skyline College changed its placement policies and English course structures and saw a significant increase in access to transfer-level English courses. Prior to fall 2015, the college primarily relied on Accuplacer to assess students' readiness for college-level English, students deemed underprepared were placed in an accelerated or two-level developmental English sequence. After the reforms, the college began using a "best of" multiple measures policy, which used test scores or high school measures for placement. Under the new policy students self-reporting at least a 2.6 GPA or a "B- or better" in 11th grade English had direct access to transfer-level English. At the same time, Skyline broadened access for students who did not qualify for the standard 3 unit transfer English course, but who had attained a 2.0 GPA or a "C or better" in 11th grade English, by offering a 5 unit transfer English course that embedded additional support. Thanks to the placement and curricular reforms in place at Skyline College, English faculty felt they were ahead of the game with AB 705 compliance. Still, given the increasing classroom heterogeneity they felt reform efforts would benefit from receiving additional support for more supplemental instructors or tutors in co-requisite courses.

The Promise of Co-Requisite Remediation

In recent years, co-requisite remediation has gained popularity nationwide. Evidence from several states suggests it can produce better outcomes than accelerated and traditional approaches to developmental education (Accelerated Learning Program 2017; Cho et al. 2012; Coleman 2015; Denley 2016; Henson, Hern, and Snell 2017; Jaggars et al. 2015; Jenkins et al. 2010; Logue, Watanabe-Rose and Douglas 2016; Palmer 2016; Royer and Baker 2018). As mentioned above, this approach (also known as mainstreaming) allows students who would otherwise be deemed underprepared to enroll in college-level math or English courses with concurrent remedial support. Unlike other forms of remediation, this approach does not require students to complete any standalone pre-requisite developmental education courses, effectively eliminating all exit points en route to college-level courses in math and English.

Early Implementers of Co-requisite Remediation in California

In 2016–17 (the latest year of available data) nine California community colleges (Cuyamaca, Fullerton, Mira Costa, Porterville, Sacramento City, San Diego Mesa, Skyline, Solano, and West Hills-Coalinga) provided co-requisite remediation in English to about 3,000 students.[16] Eligibility policies for co-requisite courses vary across colleges. In three colleges (Fullerton, Porterville and Skyline), students who would traditionally place one or two levels below transfer were eligible for the co-requisite course; in five colleges (Cuyamaca, Sacramento City, San Diego Mesa, Solano, and West Hills-Coalinga) students who placed one level below were eligible; and at Mira Costa college any student can choose to take the co-requisite with informed self-placement.[17] Most of these colleges also allow students who place into the transfer-level course to opt into the co-requisite course.

Five of the nine colleges offer linked co-requisite remediation, in which students enroll in designated sections of a college composition course with a one-to-three-unit linked support course. At all nine colleges, the same instructor teaches both the college-level and support course, and in most cases the two courses are scheduled back-to-back. Two colleges, Mira Costa and Sacramento City, offer "ALP-type" courses, with a mix of students who placed into transfer-level and students deemed unprepared.[18] Finally, at Fullerton and Skyline, students enroll in an enhanced course—a single five-unit version of college-level composition.

In math, only two colleges offered co-requisite remediation, with a combined enrollment of 1,200 in 2016–17. Los Medanos and Cuyamaca both offered transfer-level statistics with support, while Cuyamaca also offered college algebra, pre-calculus, and business calculus with support (known as the B-STEM pathway). Access to math co-requisites varies across math pathways (B-STEM or statistics); until recently, it also varied by college. For instance, at Cuyamaca College the statistics co-requisite course is open access, meaning anyone can enroll. At Los Medanos College, completion of elementary algebra with a C or better in high school or college is required for enrollment in the statistics co-requisite. However, Los Medanos is changing this policy after realizing that nearly all students were meeting the prerequisite. As of fall 2018, its statistics co-requisite course will also be open access. Access to all B-STEM co-requisite courses at Cuyamaca require the completion of Algebra II or Integrated Math III with a C or better in high school. Students with high school GPAs under 3.3, need to take a

[16] Seven additional colleges (Golden West, Mt. San Jacinto, San Joaquin Delta, Shasta, Cerritos, Modesto, and Irvine Valley) started offering co-requisite remediation in English in 2017–18.

[17] For more detailed info please review The California Acceleration Project's Co-requisite Informational Sheet.

[18] Some of the faculty we interviewed said that the Accelerated Learning Project (ALP) model to co-requisite English would not be feasible at their colleges because the co-requisite course requires small class sizes. While some see the benefit of a smaller class size, others believed that this approach could generate stigma issues for the students enrolled in the support course.

B-STEM co-requisite course. Both colleges link the transfer-level course to a two-unit support course that is taught by the same instructor, in sections scheduled back-to-back.

The scale of co-requisite implementation has varied widely across colleges—especially in English. The share of all college composition students enrolled in co-requisite courses in English ranged from 4 percent to 38 percent, while the share of all transfer-level math students enrolled in co-requisite courses ranged from 18 percent to 43 percent. At this point, we don't have enough information to assess whether the college with 4 percent co-requisite enrollment has prerequisites that limit eligibility or whether it simply offers a limited number of sections.

Co-requisite Remediation and Student Outcomes

Our prior research has found that a number of California community colleges have been transforming their developmental education offerings, guided by the principle that shorter, redesigned pathways lead to improved student outcomes (Cuellar Mejia et al. 2018; Hayward and Willett 2014; Rodriguez et al. 2017). While we found that accelerated approaches were indeed leading to higher throughput rates compared to those from traditional developmental sequences, fewer than half of the students who enrolled in an accelerated course complete a transfer-level course in the same subject. The results that we are seeing from early implementers of co-requisite remediation are more impressive.

Cuellar Mejia et al. (2018) found that students who start in one-semester acceleration are more likely to complete college composition, compared to those who start two or three levels below transfer-level (42% versus 27% and 14%, respectively). The gains that we observe from co-requisite remediation are much larger. In the four colleges that offer both co-requisite remediation and one-term acceleration, co-requisite students have throughput rates 30 to 40 percentage points higher than the rates for students who took one-term accelerated developmental English courses (Figure 4).

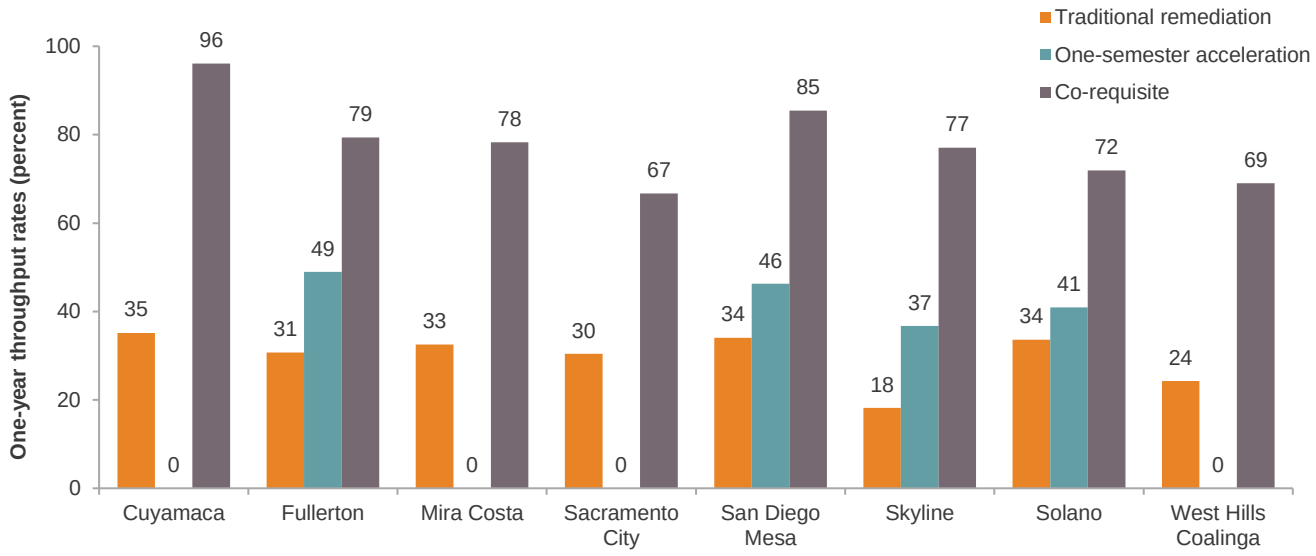
The handful of colleges that implemented co-requisite remediation in 2016–17 saw much more dramatic gains in the completion of gatekeeper courses in math and English. Results for the fall 2016 cohort show that 78 percent of all co-requisite students completed a college composition course within a year—this completion rate is three times that of students who started in traditional remedial courses, and similar to the rate of students who enrolled in transfer-level English without co-requisite support. Not surprisingly, some colleges report bigger gains than others (Figure 4).

As shown in Figure 5, students enrolled in statistics with support at both Cuyamaca and Los Medanos colleges had much larger throughput rates relative to those who started in either pre-statistics or traditional remediation. It is worth noting that we are combining students who started traditional remediation one, two, and three levels below transfer, so our throughput rates may look higher than rates presented in other analyses (Henson et al. 2017).[19]

[19] Students starting two or more levels below transfer-level have at least a year's worth of developmental education coursework that leaves them with no chance to take the transfer-level course in one year. If we look at the likelihood of students ever completing a transfer-level course by starting level in the developmental education sequence, we see that their throughput rates are still far lower than the ones of students enrolled in co-requisites (Cuellar, Rodriguez, and Johnson 2016).

FIGURE 4

Co-requisite students completed college composition at more than twice the rate of students who started in traditional remediation

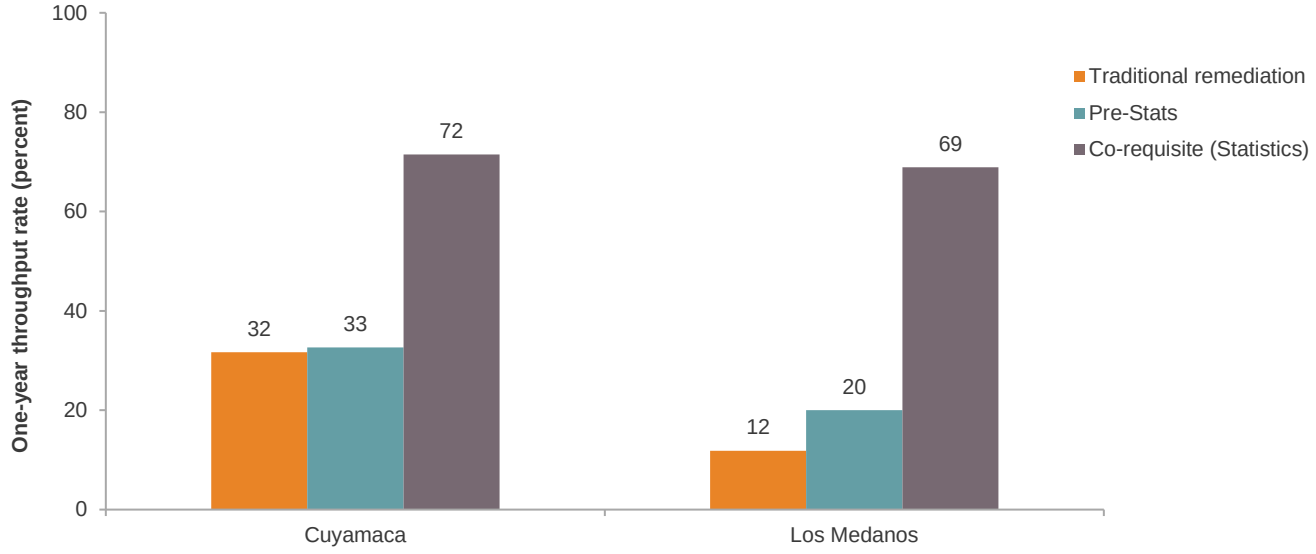


SOURCE: Authors' analysis of COMIS data.

NOTES: In the calculation of throughput rates we restrict the analysis to transfer seeking students for which the co-requisite or the one-semester accelerated course was their first course. Porterville College is not included because we only have one term of data.

FIGURE 5

Co-requisite students were more likely to complete transfer-level statistics within one year



SOURCE: Author's analysis of COMIS data.

NOTE: In the calculation of throughput rates we restrict the analysis to transfer seeking students for which the co-requisite or pre-stats was their first course.

What we learned from early implementers

A primary motivation for offering co-requisites was to provide students with an opportunity to complete the transfer-level course in their first semester while giving them the just-in-time support they need to succeed. Indeed, faculty observed that students often choose to enroll in the co-requisite option because they want to finish the transfer requirement more quickly. Students learn about the co-requisite option during the assessment and placement process and/or from high school outreach, counseling, course catalogs, and word of mouth.[20]

Some faculty mentioned the key role of the California Acceleration Project in promoting reform by helping colleges understand that traditional developmental education was not working and giving them a sense of what they could accomplish through co-requisite remediation. English faculty often noted that "equity" and "social justice" were important motivations. One faculty pointed out that before the reforms took place, many students of color were being inaccurately placed in developmental English courses, lowering their chances of success, stating that "faculty, staff and administrators didn't believe in student capacity" and did not question the accuracy of the assessment and placement systems. Faculty engaged in co-requisite reform overwhelmingly agreed that the fact that the model has fewer exit points at which students might drop out than traditional developmental education sequences is the number one reason for improved throughput rates.

Faculty in both math and English also agreed that the extra classroom time provided by the co-requisite course has contributed to the success of this reform. The extra time has allowed faculty to provide "just-in-time remediation"—focusing on concepts with which students are struggling—and has provided opportunities for "reviewing and reinforcing" the material covered in transfer-level courses, and facilitating more group-based learning. In English, the extra time allows for outlining, pre-writing, essay organization, and reading support; students also work in groups to respond to questions, engage with texts, and discuss readings that are connected to writing assignments. Furthermore, faculty appreciated having the extra time to engage in community building in the classroom. As one faculty member put it, "Pedagogy by itself doesn't get you very far; it helps that faculty create community in classroom … like knowing [the students'] names." In math, the extra time helps faculty identify areas where students struggle and allows them to embed a refresher lesson or activity that introduces concepts that will be needed in the transfer-level course. In both math and English, the extra time allows faculty to address affective issues (math anxiety or lack of academic confidence, for example). In both math and English, faculty acknowledged the importance addressing the affective domain by incorporating material on the growth mindset, setting goals, and success.[21]

At colleges that have implemented both placement and co-requisite reforms, some faculty also emphasized the importance of acknowledging and believing in student capacity. An English faculty member reflected on this by stating that "there is a profound difference between telling a student 'you tested one level below transfer'… that means 'you're not good enough … you're not ready,' versus 'you might have tested one-level below … but there's an option that allows you to go straight into the transfer-level course [with support]'—and here the message is 'you can do it … we know you can do it.'" Faculty strongly believed that the new placement process conveys this message by giving students credit for what they accomplished in high school and providing the type of support students need to increase the likelihood of success in the transfer-level course.

Faculty we interviewed (including some who used to advocate for the adoption and scaling up of developmental education accelerated pathways) expressed their belief that all students could be better served by the structure and

[20] At Cuyamaca College, faculty noted that word of mouth has played an important role: students from the larger San Diego County area are learning about Cuyamaca's curricular changes via word of mouth and deciding to complete their math requirement there.

[21] A faculty member shared that one way the affective domain is addressed in math is through discussions about "making strange choices." For example, when students are not doing their homework, faculty can help them engage in a conversation about why they might be making this decision and give each other advice on how to make sure the homework gets done.

support provided in a co-requisite model. A math faculty member who is teaching a co-requisite statistics course said that rather than implementing pre-statistics courses, colleges would be "better off going all in" with co-requisite courses. Math and English faculty at colleges implementing co-requisite courses felt they were "ahead of the game" with AB 705 compliance. These faculty members acknowledged that implementing co-requisites initiated a "natural process of whittling down" stand-alone developmental courses and that "AB 705 just makes it so it has to be done faster." Even so, some faculty worried that AB 705 took a top-down approach and did not allow for sufficient local input.

Finally, it is worth mentioning that several colleges in our interview group were beginning to have discussions about creating co-requisites for B-STEM transfer-level math courses. Faculty at these colleges expressed a need for more support and guidance on this front—they noted that their efforts would greatly benefit from a new BSSOT-type grant to support planning, implementation, and professional development.

Addressing Equity Issues

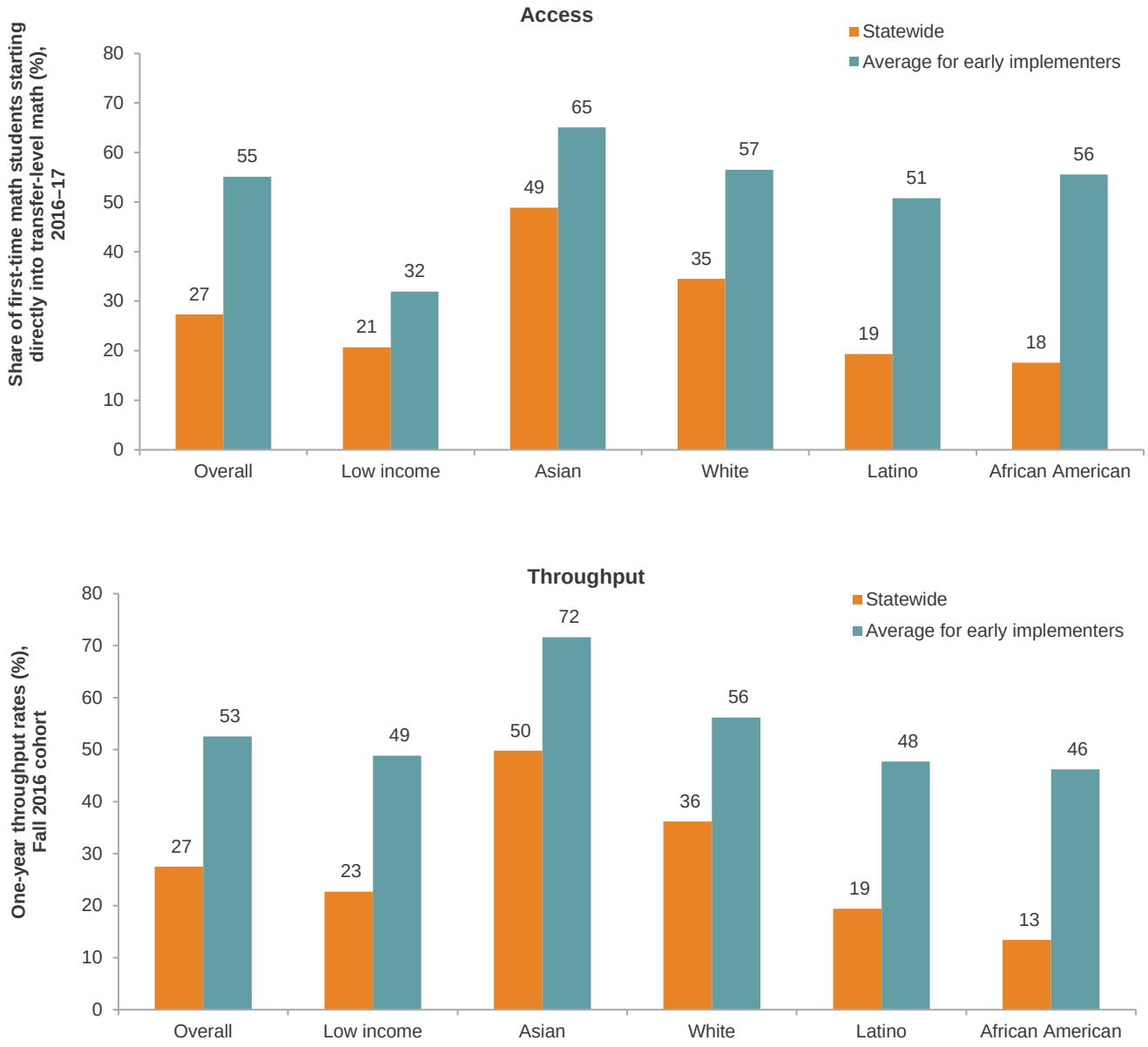
Our prior research found that students from underrepresented ethnic groups and students from low-income backgrounds are more likely to enroll in developmental education and begin the sequence at lower levels (Cuellar Mejia, Rodriguez, and Johnson 2016). We also found that while accelerated developmental math and English improve outcomes for all students, achievement gaps for underrepresented groups persist—these gaps may even be getting wider (Cuellar Mejia et al. 2018; Rodriguez et al. 2017). One of the objectives of AB 705 implementation is to minimize the disproportionate impact of inaccurate placement processes on these student groups.

Early implementers of multiple measures placement and co-requisite remediation have seen a significant increase in the total number of underrepresented students accessing transfer-level math courses (Figure 6). Overall, we found that students at early implementers are two times more likely to start directly in transfer-level math courses than students at all colleges. This is true for all racial groups. For example, on average, 1 in 2 Latino students at early implementers starts directly in transfer-level math while the average rate is 1 in 5 statewide. For African American students, the average access rate at early implementers is more than three times as high as the statewide average in math (56% vs. 18%). We also found that throughput rates are noticeably higher at early implementers: the average share of underrepresented students who complete transfer-level math within one year at early implementer colleges is more than twice as high as the statewide average. Almost half of Latino, African American, and low-income students complete transfer-level math within one year at these colleges, compared to the statewide average of fewer than one in four. Earlier implementers in math also show smaller equity gaps relative to statewide averages. For example, in terms of throughput rates, the white-Latino gap is 6 percentage points at earlier implementers and 16 percentage points statewide, and the narrowing of the gap between white and African American students is even more dramatic (1 vs. 17 percentage points).

The improvements in average college-level composition access and throughput rates are not as dramatic as the improvements in math, but they are still noteworthy (Figure 7). However, equity gaps at early implementers are only slightly smaller from the statewide average.

FIGURE 6

Access to and completion of transfer-level math courses have increased for all groups and equity gaps are smaller at early implementers

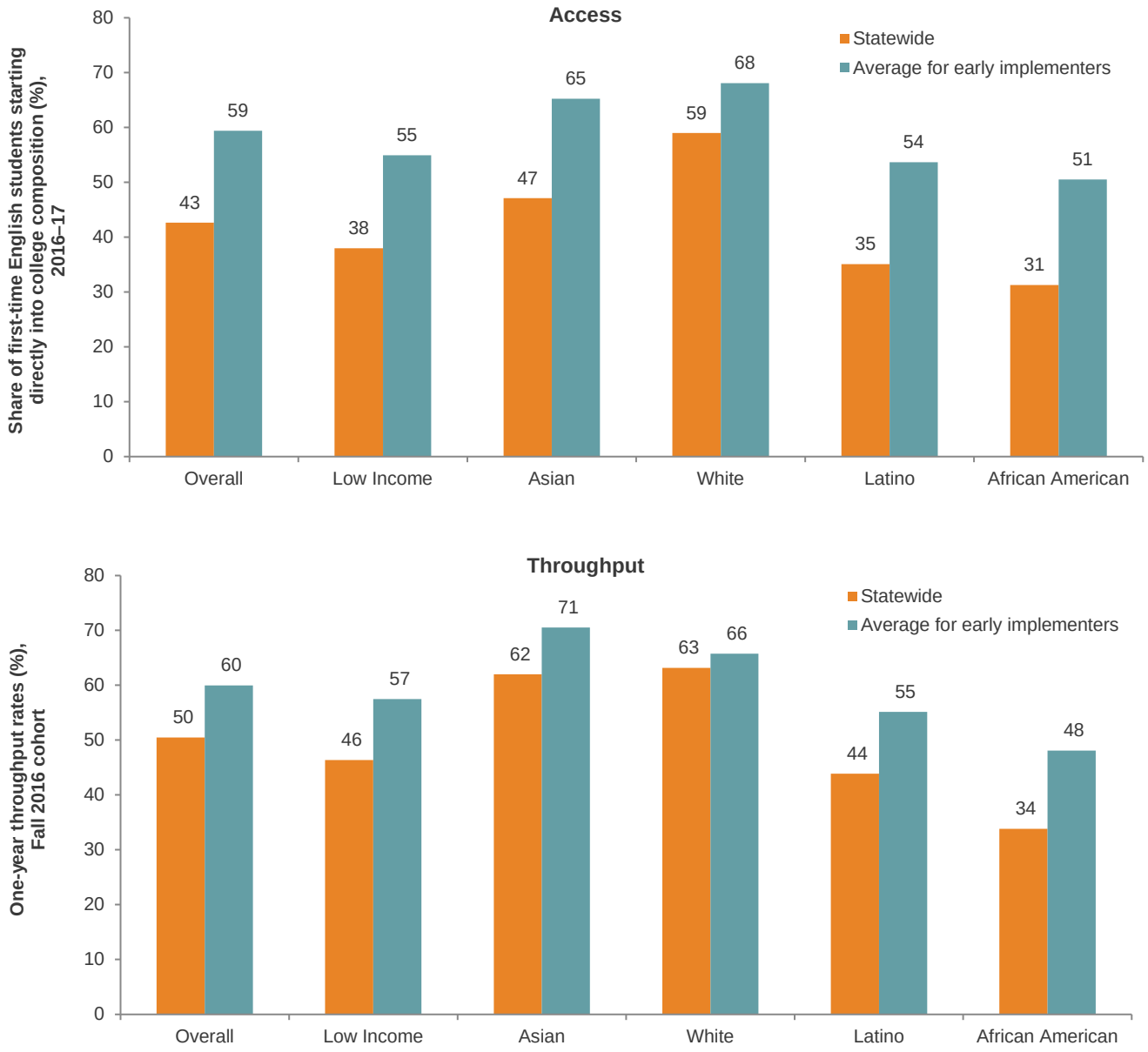


SOURCE: Authors' analysis of COMIS data.

NOTE: Early implementers refers to Cuyamaca, Los Medanos, College of the Canyons, and Siskiyous. Statewide excludes early implementers.

FIGURE 7

Access and throughput in transfer-level English are higher than the state average, but the differences are less marked



SOURCE: Authors' analysis of COMIS data.

NOTE: Early implementers refers to Canada, Cuyamaca, Irvine Valley, Las Positas, Moreno Valley, Mt. San Jacinto, Porterville, San Diego Mesa, San Diego Miramar, San Mateo, Santa Ana, Skyline, Solano and West Hills-Coalinga. Statewide excludes early implementers.

Faculty and staff we spoke to were well aware of persistent gaps. Almost all acknowledged that they could do more to improve equity by changing their own perceptions of students' capacity.[22] There were several mentions of using professional development to make faculty aware of equity issues that may be at play in their classrooms. For example, a student equity faculty inquiry group could help faculty examine classroom data disaggregated by student groups and discuss the possibility that their own biases are contributing to these outcomes. One faculty mentioned that questioning their own assumptions and recognize stereotypes that harm students are key. Both

[22] One college reported no gaps, arguing that this was because Latino students were the majority population and all groups experienced a proportionate increase in access to the transfer-level course.

math and English faculty noted that they could also do more to incorporate a "culturally relevant pedagogy" that is respectful of student backgrounds. Several faculty mentioned that their schools were using the work of Luke Wood and taking an online course on supporting men of color at community colleges.[23] Faculty also agreed on the importance of building a community in the classroom, so that students get to know each other well and faculty learn more about their students. One math faculty member talked about focusing on "things that don't have mathematical content at all, like greeting at the door, knowing people's names, being sensitive to micro-aggressions." Finally, both math and English faculty acknowledged the importance of addressing the affective domain when teaching students who have been historically underserved in higher education.

Challenges and Opportunities of AB 705 Implementation

The faculty and staff we interviewed offered many important insights on the challenges and opportunities of adopting and scaling multiple measures placement and co-requisite remediation under AB 705. Below we highlight the most salient themes.

Institutional technology (IT). Faculty frequently noted the critical role played by institutional technology in ensuring that placement and co-requisite reforms were implemented successfully. On the placement reform front, the ability of IT to streamline the process of collecting and processing high school transcript information was crucial. Several colleges spoke of the ease of implementing multiple measures when their local high school districts automatically shared transcript data with them. At other colleges, the collection of self-reported multiple measures information started as a manual process, which was very time-consuming and ended up delaying placement recommendations. After months of working with IT, some of those colleges automated the placement process and created a clearer messaging system so that students knew what their math options were immediately upon assessing. An institutional researcher emphasized the importance of having the IT department involved in the multiple measures planning process from day one. Staff at one college acknowledged that their approach could not be scaled to larger campuses because they "literally went to every student's record and did an overwrite to clear their [prerequisites]."

IT also plays an important role in the co-requisite registration process. In particular, faculty noted that registering for two separate courses—the transfer-level course and the co-requisite support course—can be confusing for students. In some cases, the confusion comes from the fact that the courses are not listed clearly. For example, at one college an English co-requisite is listed as a learning community rather than as an English course, making it very hard for students to find it without the help of a counselor. Additionally, one faculty mentioned that having to manually enroll students in the two linked courses leaves "a lot of room for human misunderstanding and error and people not having the bandwidth to manage all of that."

Variation in placement rules and developmental education course sequences. This variation across colleges—even within the same district—may have negative consequences for students whose only option is the college with higher cut scores and/or longer sequences, and for students who take courses at more than one college. In one district, the minimum GPA required for access to transfer-level English varies from 2.5 to 3.5. This has created challenges for students enrolling courses at both colleges. Students eligible for transfer-level

[23] Dr. Luke Wood is a professor and researcher at San Diego State University and the codirector of the Community College Equity Assessment Lab (CCEAL), a national research and practice center that partners with community colleges to advance outcomes for men of color. See https://coralearning.org/about/professional-development-series/ for more information.

English at the college with the lower GPA requirement have ended enrolling at the sister college because their class schedule was more convenient or for other reasons, only to be dropped when the college discovered they did not meet the 3.5 GPA cut-off. In another district, different pre-requisites and course sequence structures make it more difficult to inform students about their options within the district. What is unfortunate, one counselor told us, is that even students who are aware of the benefits of accelerated developmental pathways may choose to enroll at the sister college, which does not use multiple measures or offer an accelerated pathway, because the location of that college is more convenient.

Incorporating programs of study into the math placement process. Getting students into the right math courses for their programs of study also emerged as a challenge. Math faculty shared that counselors may not be familiar with the math options at a given college, especially if they work part-time and/or at multiple colleges. Additionally, math faculty perceived that many counselors treat intermediate algebra as the default course, whether students intend to pursue a liberal arts or STEM major. To address these challenges, two colleges have launched efforts to help students to base their course selections on their programs of interest or meta-majors. One college has included multiple measures questions about a student's meta-major in their placement process. At the other college, faculty have begun to inquire about students' career interests and transfer goals during the first days of the semester, so that course adjustments can be made if necessary. Colleges engaging in placement reforms would benefit from finding ways for counselors and faculty to work together to place students in math courses that are better aligned with their programs of study or meta-major.

Addressing resistance. It has not been uncommon for faculty and staff engaged in reform efforts to face resistance on their campuses. An institutional researcher noted that some colleagues felt that placement reform was "just a shortcut to pass along underprepared students." However, after multiple measures placement was put into place and that faculty who expressed resistance became aware that "students actually did okay" in the higher-level courses, the new placement policy "quickly became business as usual." Likewise, changes to the developmental education course sequences generated some fear among faculty, many of whom shared anecdotes about students who would have never made it into college-level courses without the developmental education sequence. Faculty reformers noted that they addressed this resistance by having collegial conversations where both sides are heard. They emphasized the importance of sharing "data and research" that shows that all groups of students benefit from co-requisite courses. Faculty and staff across the board acknowledged that the data on student success was helpful in gaining support in their reform efforts.

According to our interviewees, resistance to transforming math pathways tends to be based on an argument about the math skills required for success in college and beyond. For instance, one faculty member said that the "belief that there are a set of foundational skills that all students need to master in order to succeed in higher levels of math" created roadblocks to statistics pathways. She added that "this might be true of calculus pathways but not of liberal arts, or quantitative and statistics pathways." Additionally, math faculty perceived that some in their departments truly believed that a student should not get a "college degree if they don't know intermediate algebra." Here too, sharing data that shows the benefits in terms of students' outcomes has been helpful in gaining support for transforming math pathways.

Time burden of co-requisites. Although the extra time students spend in co-requisite courses has contributed to their success, math and English faculty shared that it was not uncommon for students to feel burdened by the amount of time they spend on these courses, especially early on. Some faculty expressed concern that the unit load might be too much for faculty and students. In fact, one faculty member said that some students may be choosing not to enroll in the co-requisite because of the hour/unit requirement (e.g., four units in standalone transfer-level English vs. six with the co-requisite). This burden can be more worrisome for students enrolled in

both math and English co-requisites—these might be the only courses students can take in a semester. Nonetheless, faculty believed that students ultimately appreciate the opportunity to get through math and English requirements more quickly. Faculty perceived that students end up really liking the extra time to get work done in class with the teacher's support. Some faculty shared that the active learning environment of co-requisite courses "helps foster a sense of community in the classroom" and facilitates peer-to-peer support. Indeed, we often heard that the extra time also helps students feel more supported and a greater sense of belonging.

Multi-level developmental sequences. At most colleges, students still have traditional multi-level developmental math and English options.[24] Faculty attributed this to a perception among some faculty that some students need "slower, discrete based instruction" and that not offering these courses could leave them behind. Faculty leading reforms would like to see more evidence that in fact there are students who are better served by a traditional sequence. They noted that lengthy multi-level sequences are not allowed under AB 705, and questioned whether their campuses should continue to offer one-level-below accelerated options. Some faculty noted that continuing to offer one-level-below options could lead to the tracking of vulnerable student populations into these courses and result in students under-place themselves. The latter was already happening in statistics pathways: all students were eligible for transfer-level statistics with support, but some were still choosing to enroll in the pre-statistics course one level below. Some English faculty we spoke with interpreted the AB 705 initial guidance memo on English placement as a call to end traditional developmental English sequences. They believed the legislation and the guidelines were essentially "forcing those who've resisted to get on board."

The role of professional development. The math and English faculty we interviewed overwhelmingly agreed that professional development is essential to the successful implementation of reforms. One faculty member noted that it is critical for faculty to "feel supported" and to feel that they are "receiving the training that they need to do well in the classroom." Many colleges reported providing in-house professional development and communities of practice—which became safe environments for faculty to talk about fears and work through issues that emerge in the classroom. Some colleges have engaged in peer-to-peer supports such as job shadowing and mentoring.[25]

External organizations have played a key role in professional development. Many colleges implementing curricular reforms have developed in-house training programs based on the California Acceleration Project's (CAP) core design principles.[26] One faculty member noted that attending CAP's Leadership Training and Community of Practice helped him facilitate the development of a community of practice on his campus.[27] Several faculty members said that the opportunity to attend conferences such as the RP Group's Strengthening Student Success Conference, the California Acceleration Project Conference, and the Conference on Acceleration in Developmental Education (CADE) "boosted and supported" campus reform efforts. Conferences also provide opportunities to learn from faculty across the region, the state, and the country.

Professional development is also key to addressing equity issues in the classroom. Faculty noted that discussions about disaggregated classroom data helped highlight issues that may have been invisible. Faculty also appreciated the professional development opportunities provided by organizations such as the Center for Urban Education (CUE) and the Center for Organizational Responsibility and Advancement (CORA)—these

[24] Cuellar Mejia et al. 2018; Rodriguez et al. 2017.
[25] Communities of practice are formed by people who engage in a process of collective learning in a shared domain.
[26] These principles include backwards design from college-level courses, just-in-time remediation, and support for affective needs. See Hern and Snell (2013) for more information.
[27] CAP's Community of Practice 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.

opportunities were especially helpful in supporting the teaching men of color and incorporating equity-minded principles into the classroom.[28]

Despite the importance of professional development, some faculty said that their colleges are unable to require participation in professional development activities, partly due to limitations in contracts and their inability to compensate faculty for their participation.

Recommendations for Moving Forward under AB 705

Our analysis shows that colleges that voluntarily implemented multiple measures placement and/or co-requisite remediation prior to AB 705 have seen substantial gains in student completion of gatekeeper transfer-level courses in English and math. All community colleges are required to be in compliance with AB 705 no later than fall 2019. To help colleges across the state as they adjust their placement policies and design curricular supports, we offer the following recommendations.

Colleges should start taking steps now toward AB 705 compliance. Adopting the default placement rules recommended by the Chancellor's Office, implementing math pathway options aligned with students' programs of study, and developing low-unit concurrent support for transfer-level coursework in math and English are all strategies that meet the requirements of the law. The Chancellor's Office notes that "there are significant opportunities for local customization and innovation in the form, delivery, and/or amount of concurrent support for students enrolled in transfer-level course work." Colleges should take advantage of this flexibility and use data to determine the approaches that best serve their students.

Institutional variation should not compromise students' likelihood of success. Local flexibility creates opportunities for innovation, but it could also harm students if colleges do not evaluate their approaches quickly and effectively. Location often plays an important role in determining which community college a student attends, and it would be beneficial for students if their zip codes did not limit their access to reforms that can significantly improve their likelihood of success.

Basic skills funding should better align with the expectations that this legislation puts forth. Earlier implementers of placement and co-requisite reform emphasized that their efforts would not have been possible without the funding they received through the Basic Skills Students Outcomes Transformation grants and the Student Equity program. Colleges will need to allocate sufficient funds to fully implement these new reforms. The Chancellor's Office should help colleges understand how the new funding formula will affect funding allocations, and which funding streams are available to support AB 705 reform efforts.

Effective professional development is necessary to ensure success. The Chancellor's Office, the Academic Senate for California Community Colleges, professional development organizations, and colleges should work together to provide professional development opportunities not only for faculty but also for counselors, academic advisors, and other student support staff. Professional development is needed to help faculty to adjust to the changes required to comply with the law. There are various levels of need: developmental education faculty need to be able to teach transfer-level courses; math faculty need to be able to teach Statistics and liberal arts math; reading faculty need to be able to teach college composition courses; faculty in general need to be able to

[28] Equity-minded individuals are aware of the sociohistorical context of exclusionary practices and racism in higher education and the impact of power asymmetries on opportunities and outcomes, particularly for African Americans and Latinos (Bensimon, Dowd, and Witham 2016).

effectively teach co-requisite models. Faculty have typically taught transfer-level courses with a very filtered student population; under AB 705, a much larger share of freshmen, students of color, and first-generation students will have access to transfer-level courses. Professional development approaches should be evaluated to ensure that they help faculty to better serve these populations. Training faculty and staff to adopt equity-minded practices can be an important tool to reduce equity gaps. As colleges move forward, a big emphasis on professional development can help ease some of the apprehension about change among faculty.

Narrowing equity gaps should be a key component of planning for AB 705 compliance. Minimizing equity gaps is fundamental to ensuring that higher education effectively serves as a ladder of economic and social mobility in California. By design, AB 705 implementation will have an immediate effect on equity gaps in access to transfer-level courses. Colleges should make sure that they have academic and non-academic support structures in place to improve the likelihood of success of all students, especially underrepresented students, and to reduce equity gaps. Our group of early implementers mentioned several key strategies: incorporating culturally relevant pedagogy and addressing the affective learning domain in the classroom; helping faculty to recognize and address their own biases through professional development; funding incentives offered by the state to colleges that show progress; and adopting equity-minded practices and policies. The effectiveness of these strategies should be rigorously evaluated—colleges should collect data and evaluate their own progress in reducing gaps.

More research is needed to monitor short- and long-term student success. As more colleges implement the reforms needed to comply with AB 705 requirements, rigorous qualitative and quantitative research should play a critical role in determining whether and how these reforms are helping students to reach and complete gateway transfer-level courses and to determine which kinds of concurrent supports work best. It will be particularly important to identify students who are not successful under these reforms, so that better interventions and supports can be developed. AB 705 is part of a larger effort to improve performance as outlined in the Vision for Success. The expectation is that AB 705 implementation will impact students' trajectories beyond gateway transfer-level courses. However, more research is needed on the longer-term impact of these reforms, particularly on underrepresented students. We need to see how students who have completed co-requisite remediation perform in subsequent college-level courses, and if they are significantly more likely to transfer to a four-year college. Finally, continued monitoring and data collection will be key to identifying and addressing unintended consequences of these reforms.

California community colleges and their university counterparts need to plan for increases in the number of transfer-ready students. As community colleges improve student pathways to and through gatekeeper transfer-level courses, there is likely to be a sharp increase in the number of students eligible for transfer to four-year institutions. Given that the number of community college students is so large, even modest gains can lead to large increases in transfer-ready students. The state should work with the community colleges, UC, and CSU to prepare for this increase. The new memorandum of understanding that was signed April 2018 by UC president Janet Napolitano and CCC chancellor Eloy Ortiz Oakley is a promising move in this direction. The agreement guarantees all qualifying CCC transfer students admission to one of the nine UC campuses if enrollment funding is provided by the state (University of California 2018).

As colleges prepare for full implementation of AB 705, there are lessons to be learned from the experiences of early implementers of placement and curricular reforms. A strong belief in students' abilities, an intentional focus on student success, and the availability of curricular and non-curricular supports are key elements behind their promising results.

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