The Implementation, Impact, and Cost Effectiveness of Developmental Education Reform in California's Community Colleges

Interim Report #3 - June 2025

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Introduction

Research shows that a majority of students entering community college do not meet readiness standards for college-level math and English courses (Jaggars & Bickerstaff, 2018). Historically, students performing below standards have been required to enroll in developmental education (DE) courses designed to improve their academic preparedness to college-level standards. However, in recent years a large body of research has emerged suggesting that DE requirements can serve as a barrier to students' degree completion. Students placed in DE typically spend several semesters working through DE courses that are not credit-bearing (Ganga et al., 2018), which is both costly and detrimental to timely degree completion. Research shows that students placed into DE are less likely to complete college-level courses or earn a degree/credential, relative to students who are not placed into DE (Boatman & Long, 2018; Clotfelter et al., 2015; Logue et al., 2019; Miller et al., 2022; Ran & Lin, 2022). Further, research has indicated significant racial disparities in both students' assignment to and successful completion of DE courses. Widespread use of standardized placement tests, often criticized for racial bias and as poor predictors of college success, likely contributes to the overrepresentation of Black, Latinx, and Indigenous students in DE (Chen & Simone, 2016), creating opportunity gaps between those students and their White and Asian peers.

In response to evidence regarding the harmful and racialized impacts of DE, many states have introduced reforms to their developmental education programs. Reforms in places like Texas and Florida have included revisions to DE placement practices, with states adopting multiple measures assessment instead of placement testing, as well as efforts to accelerate or eliminate DE sequences and instead place students directly into credit-bearing, college-level courses, regardless of academic background (Edgecombe, 2011).

California Community College Context

The California Community College system is the largest, most diverse community college system in the country, serving more than two million students each year. Since 2017, California has seen legislative efforts to reform developmental education within its community college system, specifically through Assembly Bills (AB) 705 and 1705. AB 705 laid the foundational reforms to developmental education, focusing on equity and access, while AB 1705 built upon these changes by introducing stricter accountability measures, streamlined pathways, and more robust requirements for STEM students. Together, they represent a comprehensive effort to transform California's community college system and improve student outcomes across various demographic groups.

AB 705: Foundational Reforms

In 2017, California passed AB 705 to address persistent challenges with existing DE placement practices and student outcomes. The law was also considered a racial equity mandate, as the state's Black and Latinx populations had historically been disproportionately placed into DE course sequences. AB 705 took effect in January 2018, with implementation of curricular reforms required by fall 2019. The law requires that community colleges revise their placement practices to use one or more of three measures—high school coursework, high school grades, and/or high school grade point average (GPA)—to determine course placements that will maximize the probability that a student will complete introductory, transfer-level[1] coursework in math and English within one year. To support institutions' implementation, the California Community College Chancellor's Office (CCCCO) provided guidance to institutions, offering suggested high school GPA thresholds to guide placement and provision of additional support. While not required in the language of the law, colleges were expected to respond to AB 705 by creating additional cocurricular supports, such as corequisites, to promote student success in transfer-level coursework.

AB 1705: Accountability and More Robust Requirements

In September 2022, assessing that institutions were not making adequate changes in response to AB 705, the legislature passed AB 1705. Following the passage of the law, the CCCCO provided additional implementation guidance in four key documents: a December 2022 memo, a March 2023 Implementation Guide, a May 2023 memo, and a February 2024 memo (California Community Colleges, 2022; 2023a; 2023b; 2024a). This guidance provided additional detail on the rationale for the new requirements and outlined required actions for colleges to demonstrate compliance with the law.

The law's required response was staggered over the course of three years, initially requiring institutions to enroll all United States high school graduates, regardless of background or special population status,[2] directly in transfer-level non-STEM math and English coursework by July 2023. AB 1705 prevents colleges from making students repeat coursework they've already passed in high school. It also states that non-credit courses can only supplement transfer-level coursework, not replace it. It's worth noting that while AB 705 did not explicitly permit colleges to require any students to enroll in concurrent support, AB 1705 guidance makes it clear that colleges can require some students to enroll in concurrent support, based on their academic preparation.

Like AB 705, AB 1705 received a significant amount of attention from the press, with organizations such as the Faculty Association of California Community Colleges (Myers, 2022) and the Academic Senate for California Community Colleges (Akers-Porter, 2024) developing formal oppositional resolutions and several stakeholders contributing opinion pieces to local and national outlets arguing against the reform.

Reforming STEM pathways

With evidence that some Black and Latinx students were more likely than their White and Asian peers to start in prerequisite transfer-level STEM courses (e.g., college algebra, trigonometry) (RP Group, 2024a), AB 1705 further required that by July 2024, all colleges would limit the pathway to STEM Calculus to two transfer-level prerequisites. AB 1705 also required colleges to enroll STEM students directly into Calculus as their first transfer-level STEM math course starting in July 2025.[3] The law also required colleges to validate

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[1] In the California context, "transfer-level" means that courses are transferable to either the California State University system or the University of California system, or both.

[2] Guidance clarifies that some student populations are exempt from this requirement, including students pursuing a GED, students with documented disabilities, and students in certificate programs that do not have math or English requirements.

[3] In their February 2024 memo, the CCCCO detailed placement rules for students who require STEM Calculus based on their HS GPA and math coursework: students with a HS GPA > 2.6 who have passed trigonometry, precalculus, or calculus are expected to enroll in

the effectiveness of these prerequisites by showing increased "throughput," a state metric defined as the proportion of the cohort starting in a specified course who successfully complete the course with a C or better, within the given timeframe, which for STEM Calculus 1 is two years (RP Group, 2024a).[4] Colleges were given the option to submit data to validate their STEM Calculus placement and enrollment practices, apply for interim approval for an existing preparatory course in the STEM pathway, or develop an "innovative (Calculus) preparatory course" (also known as Option D, per the February 2024 memo). Innovative courses are also subject to validation by July 2027.

Perhaps in response to public opposition, the CCCCO offered revised guidance in a December 2024 memo encouraging colleges to continue developing corequisite supports for Calculus as well as innovative precalculus courses for students requiring additional support, but offered additional flexibility in placement for students in the STEM pathway (California Community Colleges, 2024b). Specifically, the memo permits colleges to continue offering up to two semesters of transfer-level Calculus prerequisites to students depending on their high school course-taking and performance. The December memo indicates that these provisions will be reevaluated in July 2027 and colleges will need to demonstrate that these options are improving throughput in order to continue offering them.

California's AB 705 and AB 1705 Research

There has been significant attention to these reforms among California researchers, though nearly all studies have been descriptive in research design. Our qualitative research builds on existing research documenting institutional implementation of AB 705 reforms (RP Group, 2021) but adds to the conversation the experiences of campus personnel continuing to iterate on their implementation as AB 1705 has become institutionalized. We're not aware of other qualitative research exploring institutional responses to AB 1705. We also aim to contribute quasi-experimental evidence on the impact of AB 705 on enrollment, completion, and transfer, as well as providing the first cost effectiveness estimates of these reforms.

Enrollment and completion of transfer-level coursework. Descriptive research on AB 705 has demonstrated that enrollment in and completion of transfer-level coursework across all student subgroups has increased since the policy passed (RP Group 2019; 2021; 2025a). However, research has suggested that equity gaps in completion have persisted between Black and Latinx students and their White peers (RP Group, 2019; 2025a). Some student populations have seen lower throughput rates in transfer-level math compared with their peers, including students identified as economically disadvantaged, former foster care youth, and those participating in Disabled Students Programs and Services (DSPS) (RP Group, 2021). However, by fall 2023 the gap in transfer-level math throughput had narrowed for DSPS students and closed for economically disadvantaged and veteran students (RP Group, 2025a). Recent gains in transfer-level English throughput have been observed among DSPS students, economically disadvantaged students, and Umoja[5] participants, although the gap for former foster care youth has widened (RP Group, 2025a).

STEM pathways. Research conducted by RP Group indicates that STEM students starting in Calculus 1 were more likely to complete calculus than those with a similar placement profile who started in calculus prerequisite courses such as algebra, trigonometry, or precalculus (RP Group, 2024a). Additional research indicates that, when disaggregated by high school math achievement, no student group was considered highly unlikely to succeed in STEM Calculus 1 when directly enrolled and given two years to complete,

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STEM Calculus 1 as their gateway math course and colleges can recommend but not require additional concurrent support. Students with lower HS GPAs and those who have not passed the requisite coursework in high school are expected to enroll in STEM Calculus and additional concurrent support can be required.

[4] The timeframe codified in AB 705 was one year, although the timeframe associated with STEM Calculus per AB 1705 is two years, and the timeframe is marked from the student's first enrollment in the transfer-level course rather than at their college entry.

[5] Umoja is a learning community for students from the African and African American diasporas.

although throughput rates increase for each increase in the level of high school math achievement (RP Group, 2024b). It should be noted that the methodology of these studies has been criticized by opponents of AB 1705 who argue that students granted direct access to Calculus in the pre-reform time period are dissimilar in critical ways to those who would have been placed into prerequisite coursework, therefore their success in direct Calculus placement does not generalize to other students with different levels of preparation (Ford, 2024). Similarly, critics suggest that the reports do not present sufficient evidence that prerequisite coursework undermines subsequent success in Calculus.

Transfer and attainment outcomes. A recent study looked at rates of transfer to four-year colleges and associate's degree attainment, finding that these increase for all racial and ethnic groups and all levels of high school preparation in the post-policy period, although they remain low, which the authors suggest is due to part-time enrollment among community college students (RP Group, 2025b).

Purpose of this Interim Report

Researchers from Research for Action (RFA) and the University of Texas at Austin are engaged in three overlapping mixed-methods studies of the reforms associated with AB 705 and 1705, addressing research questions related to the implementation, impact, and cost effectiveness of these reforms. This Interim Report, presented at the conclusion of year four of the study, contributes to an understanding of the following research questions:

Study	Research Question	Details
Implementation Study	RQ1	How are California community colleges implementing curricular reforms? How do institutional policies and practices regarding curricular reform vary across colleges?
	RQ1a	How do policies and practices in math and English departments vary within colleges?
	RQ2	How do institutional capacity and faculty buy-in affect institutional adoption and implementation of curricular reforms?
	RQ2a	How do capacity and faculty buy-in vary between math and English departments, and why?
Impact Study	RQ3	What is the impact of transfer-level placement, compared with placement into a prerequisite DE math or English course, on both short- and long-term student outcomes?
	RQ4	What is the overall impact of the AB 705 policy on student outcomes (e.g., transfer-level math passing rate in the first year)? Does the effect of AB 705 vary across students with high, middle, and low high school achievement?
	RQ4a	Does the overall policy effect vary across different socio-demographic student groups?
Cost Effectiveness Study	RQ5	Are introductory, transfer-level courses with or without cocurricular support more cost-effective than DE courses as a whole (corresponding to RQ4)?
	RQ6	Which cocurricular support model is the most cost-effective (corresponding to RQ5)?

Implementation Study

Our implementation study seeks to understand how California community colleges have responded to AB 705 and 1705 through systemwide data collection and in-depth case studies at fifteen institutions. Case studies were conducted over a two-year period, with site visits in 2022 focused on implementation of AB 705 and 2024 site visits focused on implementation of AB 1705. The study addressed the following research questions:

Implementation Study	Research Question	Details
	RQ1	How are California community colleges implementing curricular reforms? How do institutional policies and practices regarding curricular reform vary across colleges?
	RQ1a	How do policies and practices in math and English departments vary within colleges?
	RQ2	How do institutional capacity and faculty buy-in affect institutional adoption and implementation of curricular reforms?
	RQ2a	How do capacity and faculty buy-in vary between math and English departments, and why?

Case studies. Our case study sample was identified through the development of a Scale of Implementation to classify institutions along a continuum of implementation, from low to high. The Scale of Implementation relies on four indicators of math and English department practices: proportion of introductory courses offered at transfer-level; prevalence of cocurricular support; placement measures utilized; and placement guidance provided to students. Additional details about the Scale are available in our year 2 report (Burkander et al., 2024a).

We balanced the sample with consideration for region, size, urbanicity, and enrollment of Black and Latinx students, identifying five colleges each in the low, medium, and high quintiles. We ultimately secured participation from thirteen colleges in 2022: four low implementers, five middle implementers, and four high implementers. We added two institutions to our case study sample in 2024 based on their implementation of the reforms: one college was offering nearly all their course sections online, and another was using an embedded counselor model that we wanted to better understand.

Our sampling frame included the 65 institutions who completed spreadsheets indicating the course structures and supports offered in the 2021-22 academic year in math and English introductory, transfer-level courses. Table 1 below provides enrollment and demographic information about our site visit samples, compared to the 114 California community colleges included in our full quantitative sample and unsampled institutions within our sampling frame. This table illustrates that the institutions within our sampling frame are comparable to the rest of the colleges in the system. Enrollment size is comparable between sampled and unsampled institutions within our sampling frame. Our 2022 and 2024 samples differ slightly in regional and urbanicity representation, as the two institutions added in 2024 were both from the Los Angeles region; those institutions also altered the average Black and Latinx enrollment percentages for the sample. Overall, institutions within our sampling frame have lower enrollments of Black and Latinx students than those outside of the sampling frame.

Table 1: Case study sample characteristics compared with unsampled institutions

	All California Community Colleges	Unsampled Institutions within Sampling Frame	2022 Site Visit Sample	2024 Site Visit Sample
Total Institutions	114	50	13	15
Average Enrollment (Fall 2021)	11,660 (SD 6,985)	11,547 (SD 6,639)	10,567 (SD 6,600)	11,000 (SD 6,624)
Percent Hispanic/ Latinx	46.8% (SD 16.4)	47.3% (SD 18.0)	42.0% (SD 17.5)	40.9% (SD 16.5)
Percent Black/ African American	5.9% (SD 5.2)	5.0% (SD 3.8)	4.6% (SD 4.0)	5.3% (SD 4.2)
Bay Area Region	29	15	1	1
North/Far North Region	14	8	3	3
Inland Empire/ Desert Region	12	3	2	2
LA/Orange County Region	28	9	2	4
South Central Coast Region	8	3	2	2
San Diego/ Imperial Counties Region	9	5	1	1
Central/ Mother Lode Region	14	7	2	2
Urban Colleges	50	22	3	4
Suburban Colleges	43	20	7	8
Rural Colleges	20	8	3	3

Note: Enrollment figures are sourced from California Chancellor's Office Datamart

We conducted in-depth site visits in 2022 with the original sample, and in 2024 with the expanded sample.

- During our 2022 site visits, completed between October 2022 and February 2023, we conducted interviews with math (n=24) and English (n=24) faculty, department leadership (n=29), and administrators (n=45) working closely to support AB 705 implementation. We also conducted surveys (n=249) and focus groups (n=43) with students in introductory, transfer-level math and English courses.
- During our 2024 site visits, completed between September 2024 and February 2025, we conducted interviews with math (n=31) and English (n-26) faculty, department leadership (n=32), counselors (n=22), and administrators (n=19) working closely to support AB 705 and 1705 implementation. We also conducted surveys (n=765) and focus groups (n=49) with students in introductory, transfer-level math and English courses.

Faculty surveys. These fieldwork data are complemented by a survey administered to all math and English faculty at the fifteen site visit institutions in spring 2025. This survey was developed to address four constructs: institutional capacity, faculty buy-in, pedagogy, and faculty mindsets. We obtained math and English department rosters from 13 of our 15 sample institutions and sent personalized survey links to all

full- and part-time faculty members. Faculty members received $25 gift cards for completing the survey. 142 faculty completed our survey, a response rate of 20%. Because we included part-time faculty and asked respondents to reflect on the institution where they taught the most course sections, some faculty shared perceptions of a different California community college. We excluded these responses from our analysis of institution-specific constructs. Table 2 presents the demographic characteristics of the full and restricted survey sample. The full and restricted samples are not significantly different in terms of gender, racial background, full/part-time status or department. It is worth noting that our survey sample skews female and White, with a larger share of respondents indicating that they are full time faculty members and English faculty.

Table 2. Demographics of Faculty Survey Respondents

Demographics	**All Survey Respondents**	**Survey Respondents from Study Schools**
_n colleges	19	13
_n staff	142	135
Gender		
Female	57.8%	57.8%
Male	36.6%	36.3%
Gender Nonbinary	0.7%	0.7%
Prefer not to answer	4.9%	5.2%
Race		
Hispanic/Latino	11.3%	11.9%
Asian	11.3%	11.1%
White	66.2%	65.2%
Black or African American	2.1%	2.2%
Middle Eastern or North African	2.8%	2.2%
American Indian or Alaskan Native	2.1%	1.5%
Native Hawaiian or Other Pacific Islander	0.7%	0.0%
Other	2.8%	1.5%
Prefer not to answer	12.0%	12.6%
Full-time/part-time status		
Full-time faculty	61.0%	62.2%
Part-time faculty	39.4%	37.8%
Subject taught		
Math faculty	38.0%	39.3%
English faculty	62.0%	60.7%

Note: Percentages in the race variable do not sum to 100% because faculty could indicate more than one option.

Student surveys. The Implementation Study also draws on data from a survey administered to students in focus groups during our site visits. All focus group participants completed the survey during our site visits, and students were compensated with $15 gift cards for their participation. This survey was developed to address five constructs: placement guidance received from faculty and counselors, help-seeking, sense of belonging, racial climate, and instructional strategies used by faculty in introductory, transfer-level math and English courses. We leverage results from the last construct alongside findings from our interviews and focus groups in this report. Table 3 presents the demographic characteristics of students who took the survey. This table indicates that male students are slightly overrepresented, and the majority are

traditionally-aged college students. About a quarter of respondents identify as White, a quarter of respondents identify as Hispanic/Latinx, and nearly 30% of respondents identify as Two or More Races.

Table 3. Demographics of Student Survey Respondents

Demographics	**Survey Respondents**
_n colleges	13
_n students	765
Gender	
Female	39.4%
Male	48.3%
Gender Nonbinary	3.8%
Prefer not to answer	8.5%
Race/Ethnicity	
Hispanic/Latino	25.9%
East Asian	0.9%
Southeast Asian	2.9%
South Asian	1.7%
White	25.5%
Black or African American	3.5%
Middle Eastern or North African	1.8%
American Indian or Alaskan Native	0.7%
Native Hawaiian or Other Pacific Islander	0.3%
Two or More Races	28.3%
Prefer not to answer	8.6%
Age	
Under 18	3.8%
18-24	75.2%
25 or Older	13.8%
Prefer not to answer	7.2%

Note: Percentages in the race variable do not sum to 100% because students could indicate more than one option.

Analytic Methods

To analyze case study data, the team conducted a comprehensive thematic analysis, triangulating findings across multiple data sources and analyzing patterns across institutions through case comparisons. At the conclusion of each site visit, the research team developed an exit memo to document observations and emergent themes. Interviews and focus groups were audio-recorded and transcribed, and coded in Dedoose using 20 inductive and deductive codes related to implementation. Deductive codes were developed based on our 2022 fieldwork, where the team reviewed each of the existing codes for continued applicability. We removed some codes from the list as they were determined to be no longer relevant to the current context of implementation (e.g., impact of COVID, pre-transfer level courses offered), based on exit memos. We retained codes associated with colleges' placement policies and cocurricular structures and supports (e.g., corequisites, embedded tutoring), as well as codes associated with buy-in among the various stakeholder groups (e.g., faculty, administrators), resources leveraged, and successes and challenges. We added a few

inductive codes based on our team discussions of themes which emerged during fieldwork (e.g., dual enrollment, data use). Coding was done by a team of researchers, who established inter-rater reliability by independently coding three transcripts and resolving any differences in interpretation in team meetings. Using the coded data and exit memos, the team developed institutional profiles for each sample college, summarizing key findings. These profiles were shared with colleges as a form of member checking and were used by the team to synthesize cross-site findings through thematic analysis, a methodology recognized for its usefulness in describing commonalities across a set of interviews (Vaismoradi et al., 2013). We then triangulated these findings with those from descriptive analyses of our faculty and student surveys to answer the implementation study research questions.

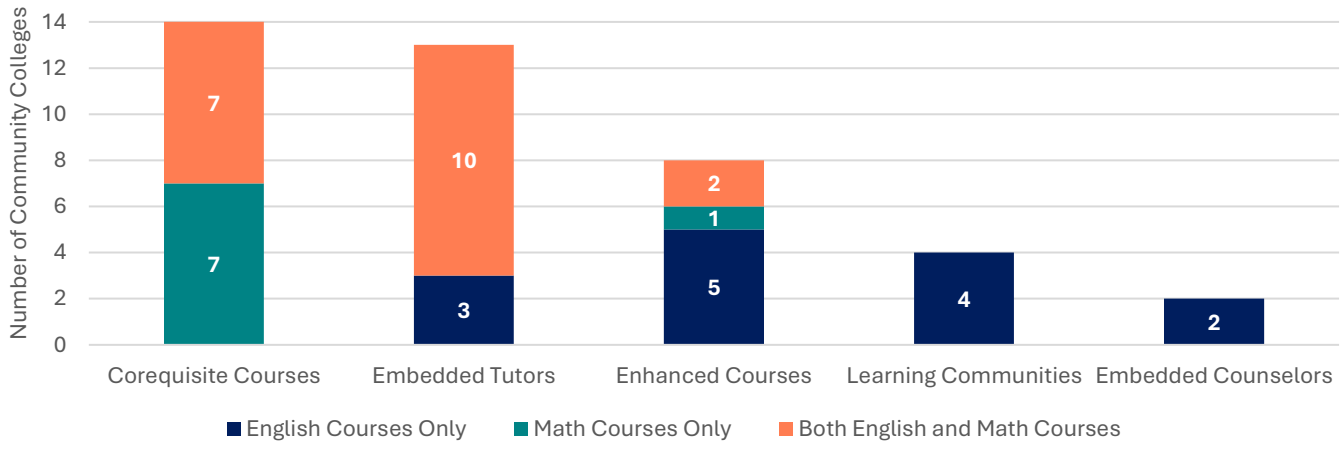
Implementation Study Findings

This report presents findings associated with seven themes observed across the study sample: cocurricular supports, instructional support strategies, level of campus support for the reforms, data use, resources used or needed for implementation, equity and deficit mindsets, and professional development and technical assistance. We share findings from our interview and faculty survey respondents on these themes, supplemented with findings from student focus groups and survey responses where applicable. Throughout this analysis, we present findings from math and English department faculty to highlight differences in implementation, institutional capacity, and buy-in.

Cocurricular Supports

With the expansion in the share of students enrolling directly into introductory transfer-level courses in math and English, it has become critical to provide additional academic supports to increase their chance of success. Five types of cocurricular supports (i.e., corequisite courses, enhanced courses, embedded tutors, embedded counselors, and learning communities) have been implemented in the sample community colleges. Multiple cocurricular models can be implemented within the same course section; for instance, embedded tutors are commonly used to support students in a corequisite or enhanced course section. While in some cases these cocurricular supports were in place prior to the passage of AB 705 and AB 1705, the development and implementation of these models have expanded in response to these laws. Figure 1 below outlines how many colleges were implementing each of the cocurricular models across sample community colleges during the 2024-25 site visit.

Figure 1. Implementation of cocurricular models across sample community colleges



As shown in Figure 1 above, **the corequisite model is the most common type of cocurricular support** and is utilized in either math courses or both math and English course in 14 of the 15 sample community

colleges. However, **embedded tutoring is nearly as common**, with implementation in both math and English courses in 10 sample community colleges and an additional three English departments. Enhanced courses have developed in eight sample institutions, while the integration of learning communities in course sections and embedded counselors are far less common. Each of these cocurricular models will be explored in further detail below.

Corequisite Courses

Corequisite courses pair a transfer-level course in math or English with a separate support course to help facilitate student success. Typically, students register individually for the main course and the support course. In some but not all cases, the lecture and the support course both receive course credits or units (e.g., English 101 is a 3-unit course with a 2-unit support course for a total of 5 units). In some colleges, the corequisite model was already in place prior to AB 705.

While the corequisite model was the most common cocurricular support across sample colleges, the number of math and English course sections offering corequisite support has decreased in at least six sampled institutions since our 2022-23 site visits. In most cases, institutions do not require students who meet specific placement thresholds to enroll in corequisite support labs, which has led to decreases in the number of sections offered. While not the case in all community colleges, and despite the guidance related to AB 1705, a common understanding across institutions is that state policy does not allow them to require students to take particular courses, including corequisite course sections. As a result, it is left up to the students to decide and many make the decision not to enroll in a support lab, including students who might benefit the most from this increased level of academic support. Due to these and other challenges with the model (e.g., confusion in registering for two paired courses), in at least six sample colleges respondents reported a decrease in the number of corequisite support sections offered, thereby limiting the support available to students.

Embedded Tutors

Embedded tutors are typically community college students who have successfully completed an introductory, transfer-level math or English course and are then recruited by the faculty member teaching that course or by the campus tutoring center to provide support to students in that course during class time as well as outside of class. Embedded tutors often receive training from the tutoring center on their role and are available in the tutoring center to help students.

Embedded tutoring was commonly described as a valuable and effective model to support student success. In at least nine sample colleges, respondents including students, faculty, and counselors reported that embedded tutoring was a helpful resource. Hiring tutors to support students, both during classroom instruction and outside of class in the tutoring center, helps to improve student content knowledge and skills, while also building relationships between the tutors and students that help to address the stigma related to asking for academic support in the tutoring center. For example, according to a counselor and a student, respectively:

> *The embedded tutors are amazing. Everybody always raves about the embedded tutors in English, math, everywhere… I love that model. Our tutoring center does a fantastic job of training them and teaching them how to interact with students and making them available to students.*

> *If you ask [the embedded tutor] questions, she knows all the information. She's like a second teacher essentially… if the teacher is preoccupied, she can help come over and explain everything you need to know, and that's very helpful to have.*

Enhanced Courses

Unlike the corequisite model, under the enhanced model students only have to register for a single course that provides integrated support instead of two paired courses, which helps to eliminate confusion. Both the primary instruction and just-in-time remediation are provided in the single course that meets for more credit hours than a traditional course.

Some colleges have been shifting away from the corequisite model and instead integrating supports into the main course through the enhanced model. In at least six sample colleges, challenges with the corequisite model have led math and/or English departments to offer enhanced or composite courses in which just-in-time remediation is offered in the primary course instead of a separate support lab. Enhanced models can also allow for smaller unit loads. One English faculty member emphasized the need to be able to provide instruction and support at the same time. Similarly, math instructors reported success in enhanced statistics classes due to collaborative, group-based learning environments.

Learning Communities and Embedded Counselors

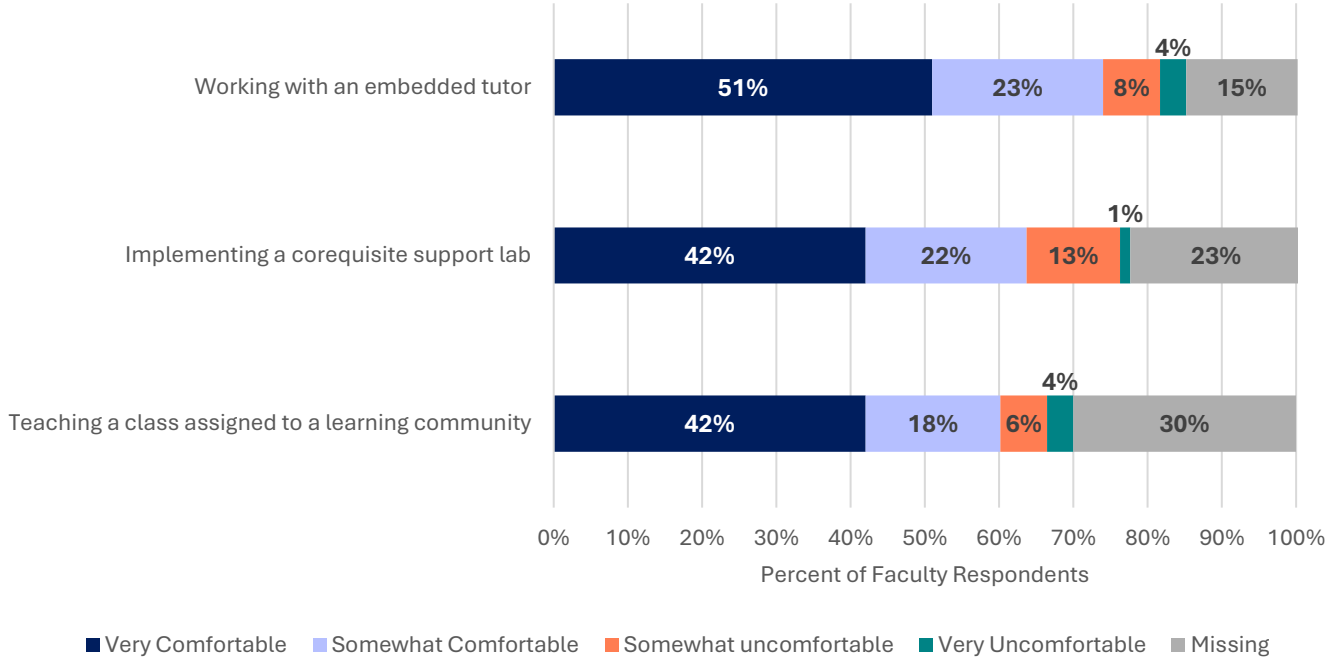
While not as common as the other cocurricular supports, the development of introductory, transfer-level English course sections that are reserved for students in a learning community and the use of embedded counselors have found support in a portion of the sample community colleges. More specifically:

- **Learning communities have been integrated into the classroom to provide additional academic and social support to students.** Learning communities, such as Puente, provide support to specific student subgroups (e.g., Hispanic/Latinx students) through both academic and social programs, and often predate AB 705 in our sample colleges. In at least four sample colleges, student cohorts included in learning communities are assigned to the same sections of introductory math and English courses. This allows students from similar backgrounds to provide support to one another inside, as well as outside, the classroom. Further, this addition to course sections can support community-building, which helps students feel connected to school.

- **Embedded counseling is the least common cocurricular support but has been developed in two sample community colleges.** One of the study institutions developed a model that preceded AB 705, specifically a partnership between the counseling and English departments. This model pairs a counselor with each section of English composition. Respondents indicated that AB 705 provided an opportunity to restructure the program; the model is now intended to provide holistic supports and intrusive advising to students, particularly those who are not currently affiliated with a learning community on campus (e.g., Puente). In the second sample college, embedded counseling was a much lighter touch, with a counselor visiting English courses once in the beginning of the semester.

The faculty survey explored respondents' level of comfort in providing cocurricular supports, as shown in Figure 2 below.

Figure 2. Faculty comfort level in providing academic support and implementing cocurricular models (n=142 faculty)



Most faculty indicated that they were comfortable implementing cocurricular support models. The survey asked faculty about their level of comfort implementing cocurricular supports, specifically embedded tutoring, corequisite courses, and learning communities assigned to course sections. 74% of faculty indicated that they were very or somewhat comfortable working with an embedded tutor and 64% of faculty indicated that they were comfortable implementing a corequisite support lab. 60% of faculty reported feeling comfortable teaching a class embedded in a learning community. Learning community comfort-level responses were missing for 30% of faculty, which is not surprising given that most institutions are not implementing math courses in that context.

Instructional Support Strategies

In response to the changing needs of students in introductory, transfer-level courses, faculty are implementing many equity-minded instructional strategies to support student success. English faculty in particular report higher frequency of use and higher perceptions of effectiveness for many of these strategies, including contextualization and culturally responsive pedagogy. Math and English faculty report using scaffolding frequently; students also report that faculty often use scaffolding. Unsurprisingly, faculty typically reported that they frequently implemented strategies that they believed were effective; one notable exception to this is flexible deadlines, which faculty did not rank as highly effective yet report frequently employing. Overall, the findings suggest a continued commitment among faculty, particularly in English, to applying instructional practices that foster inclusion, responsiveness, and formative feedback, with ongoing opportunities to increase adoption across math departments.

Frequency of use

As shown in Figures 3 and 4 below, faculty and students report several strategies that are commonly implemented as instructional strategies in transfer-level courses: scaffolding, support for individual students, just-in-time remediation on basic skills, small group work, and deadline flexibility.

In Figure 3, we present data from our faculty survey to assess how often specific instructional support strategies are being implemented across community colleges in California. We present the data separately

for English and math faculty, because we identified important differences across subject areas in the data. Overall, several strategies are commonly implemented across both English and math faculty, but English faculty appear to use these strategies more frequently than math faculty. Further discussion follows the figure.

Figure 3. Instructional support strategy usage frequency according to faculty survey respondents (n=142)

English Faculty (n=88)	Math Faculty (n=54)
Scaffolding	Scaffolding
Individual Feedback	Individual Feedback
Contextualization	Contextualization
Culturally Responsive Teaching	Culturally Responsive Teaching
Flexible Assignment Deadline	Flexible Assignment Deadline
Just-in-Time Remediation	Just-in-Time Remediation
Low Risk Formative Assessment	Low Risk Formative Assessment
Small Group Work	Small Group Work
Basic Skills Review	Basic Skills Review
Flipped Classroom	Flipped Classroom
Collaborative Assessment	Collaborative Assessment

Key	
	> 75% of respondents reported that they used the instructional support strategy often
	50% - 74% of respondents reported that they used the instructional support strategy often
	25% - 49% of respondents reported that they used the instructional support strategy often
	≤ 24% of respondents reported that they used the instructional support strategy often

Key takeaways from the heat map above include the following:

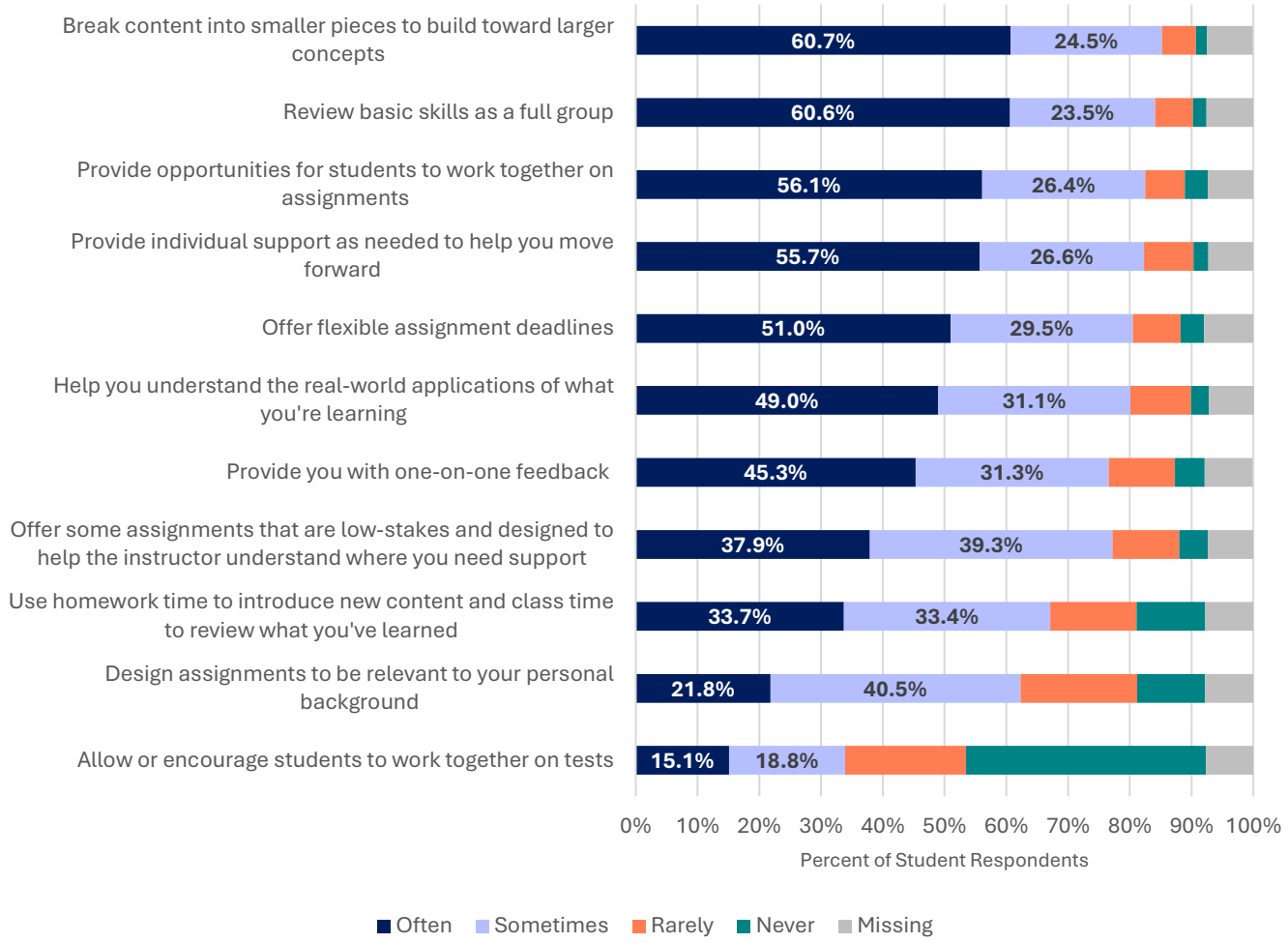
English faculty (n=88) reported higher frequency across a variety of instructional supports as compared to their math counterparts (n=54). Instructors were asked how frequently they implemented various instructional support strategies aimed at promoting student success. 75% or more English faculty reported frequent use of two strategies (scaffolding and individual feedback), while between 50 and 74% of English faculty reported frequent use of six additional strategies: contextualization, culturally responsive teaching, flexible assignment deadlines, just-in-time remediation, low risk formative assessment, and small group work. In contrast, scaffolding was the only strategy reported as being used frequently by at least half of math faculty.

Instructional scaffolding emerged as the most widely used strategy across both departments, according to faculty members. This is also consistent with the previous years' survey findings and faculty interview data across departments (Burkander et al., 2024a; 2024b). We heard several respondents during fieldwork describe instances of scaffolding as an instructional strategy. At one institution, an English faculty member described breaking down writing essays into discrete parts. A student further explained that their teacher "points out the main features of what people usually struggle with and basically uses better pacing. She spoke about the formatting and then went into depth about quotations." A faculty member similarly reported that:

I have broken it apart more… scaffolding assignments into little pieces that are more manageable and not overwhelming… realizing that students [may not know] how to get through the first paragraph, so just breaking it down into the pieces… it seems like that's helped a lot in student understanding and performance.

When looking at student survey data, we see similar patterns to the faculty survey data, with scaffolding reported to be the instructional strategy used most often, as shown in Figure 4 below.

Figure 4. Instructional support strategy usage frequency according to student survey respondents (n=766 students)



Key takeaways from Figure 4 above include the following:

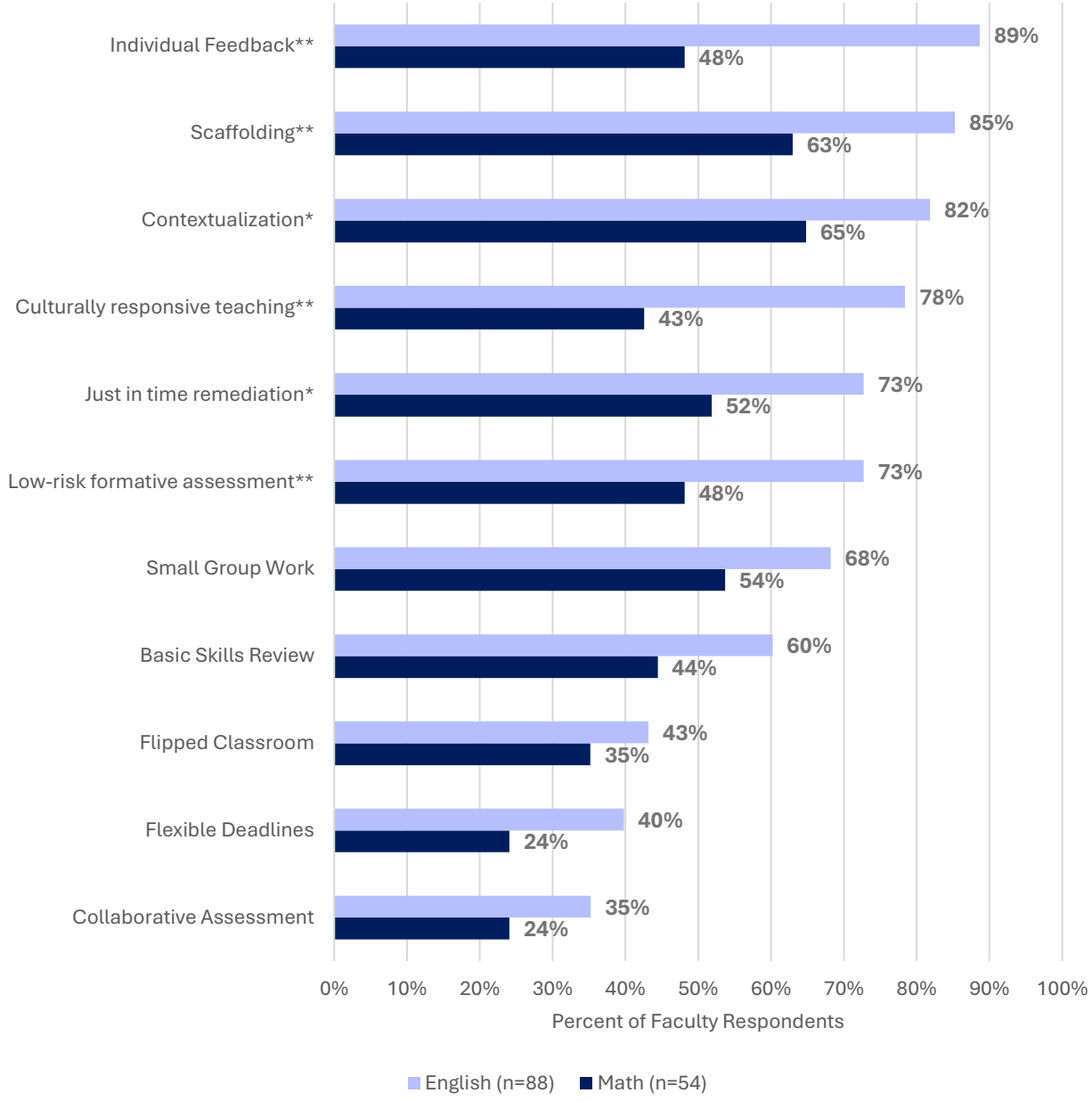
Students reported that their instructors most often provide scaffolding support and review basic skills. About three in five students report that their faculty often "break content into smaller pieces to build toward larger concepts," and "review basic skills as a full group" in class. Group work, individual support, and flexible assignment deadlines are also strategies often used by faculty, according to students.

Perceptions of effectiveness

Perceptions of the effectiveness of each instructional strategy on the survey were higher for English faculty than for math faculty. The two most polarizing strategies were individual feedback and culturally responsive teaching, where English faculty were statistically and substantively more likely than math faculty to report that these strategies were effective.

The faculty survey asked respondents to indicate whether they found each instructional support strategy to be effective. Figure 5 indicates that English faculty overall were more likely than math faculty to report that these strategies were effective. While math and English faculty both reported many of these strategies to be effective, there were some significant differences between department faculty.

Figure 5. Percent of faculty reporting that strategies are "very" or "extremely" effective (n=142 faculty)



Note: Items with * show significant differences between departments at p<=0.05; items with ** show significance at p<=0.01

Compared to math faculty, a significantly larger share of English faculty report that **individual feedback, scaffolding, contextualization, culturally responsive teaching, just-in-time remediation** and **low-risk formative assessment** were effective**.** Scaffolding and contextualization were also highly ranked by math faculty.

In focus group discussions across sites, students reported that faculty are effective at scaffolding by breaking concepts down into more manageable pieces. For example, an English student explained that:

> *We broke up our essay into parts where we focused on an introduction for one day, and then we did a peer review on that, and then we did body paragraphs, then we did a conclusion, then we did a first draft, and then we did the final draft. It's one assignment broken up into different small bite-sized pieces.*

Students further shared that they appreciated it when instructors took the time to ensure that the class was following along and created a safe space to ask questions.

Other strategies, such as collaborative assessments, flipped classrooms, and flexible deadlines were perceived as less effective, especially among math faculty. Despite indicating that they use the strategy frequently (see Figure 3), only 40% of English faculty and 24% of math faculty indicated that offering flexible deadlines was an effective strategy. Flipped classrooms were rated lower as well, with just 35% of math and 43% of English faculty reporting those strategies as very or extremely effective. In interviews, faculty explained that with the flipped classroom model, some students did not make adequate use of instructional videos outside of class. Department leaders also noted that the flipped classroom model may have limited value for students who are working full-time while attending school. Further, while some faculty saw flipped classrooms as beneficial for students who prefer a hands-on learning environment, they acknowledged that this format does not work for everyone, particularly those who struggle to keep up with out-of-class lectures.

English and math faculty differed in their perceptions of the effectiveness of culturally responsive teaching. Culturally responsive teaching has been encouraged by the Chancellor's Office as a best practice and has been the focus of many colleges' professional development in response to AB 705 and 1705 reforms. However, English faculty were significantly more likely than math faculty to report that they use the strategy frequently. Only 43% of math faculty reported that culturally responsive teaching was effective, while 78% of English faculty reported this perception. Our 2024 faculty survey (Burkander et al, 2024b) found that these figures were 35% and 85% respectively, indicating that while enthusiasm about culturally responsive pedagogy is growing among math faculty, it may be waning among English faculty. There is still notable resistance among some math faculty to embrace these practices: "*Okay, here's a math problem. It's not black, white, yellow, or red. It's numbers and letters.*"

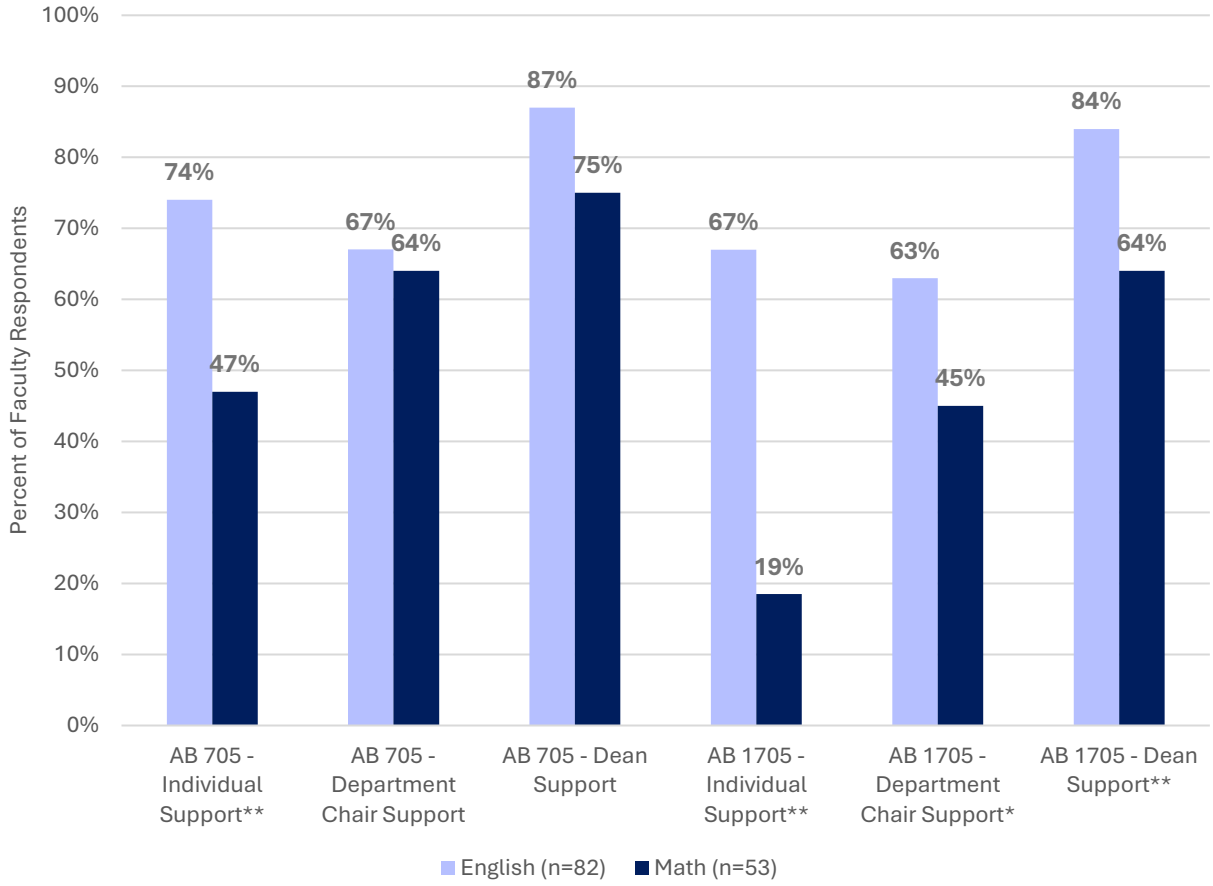
Level of Campus Support for AB 705 and AB 1705

Overall levels of campus support for AB 705 are higher than those for AB 1705, and levels of support are higher among English faculty than math faculty. Support for these reforms is partly related to faculty perceptions of how students are faring, and their concerns about certain students who may be harmed by these reforms. English faculty shared significant concerns related to English Language Learners, and math faculty expressed concerns about students who were returning after an absence, those not planning to transfer to a four-year institution, and veteran students.

Faculty perceptions of the policies

We surveyed faculty about their support for the policies as well as their perceptions of support among their department leadership (Figure 7). Overall, support for AB 705 is slightly higher than that for AB 1705, and English faculty were more likely to report that they and their department leadership were supportive of the reforms than math faculty. Although there are no significant differences among perceived leadership support between English and math for AB 705, English faculty were significantly more likely to report support for both AB 705 and 1705 than math faculty. Notably, math faculty reported that they had lower levels of support for AB 705 and 1705 than their department leadership, and that their chairs had lower levels of support than their deans.

Figure 7. Faculty assessments of support for AB 705 and 1705 (n=135 faculty)



Note: Items with * show significant differences between departments at p<=0.05; items with ** show significance at p<=0.01

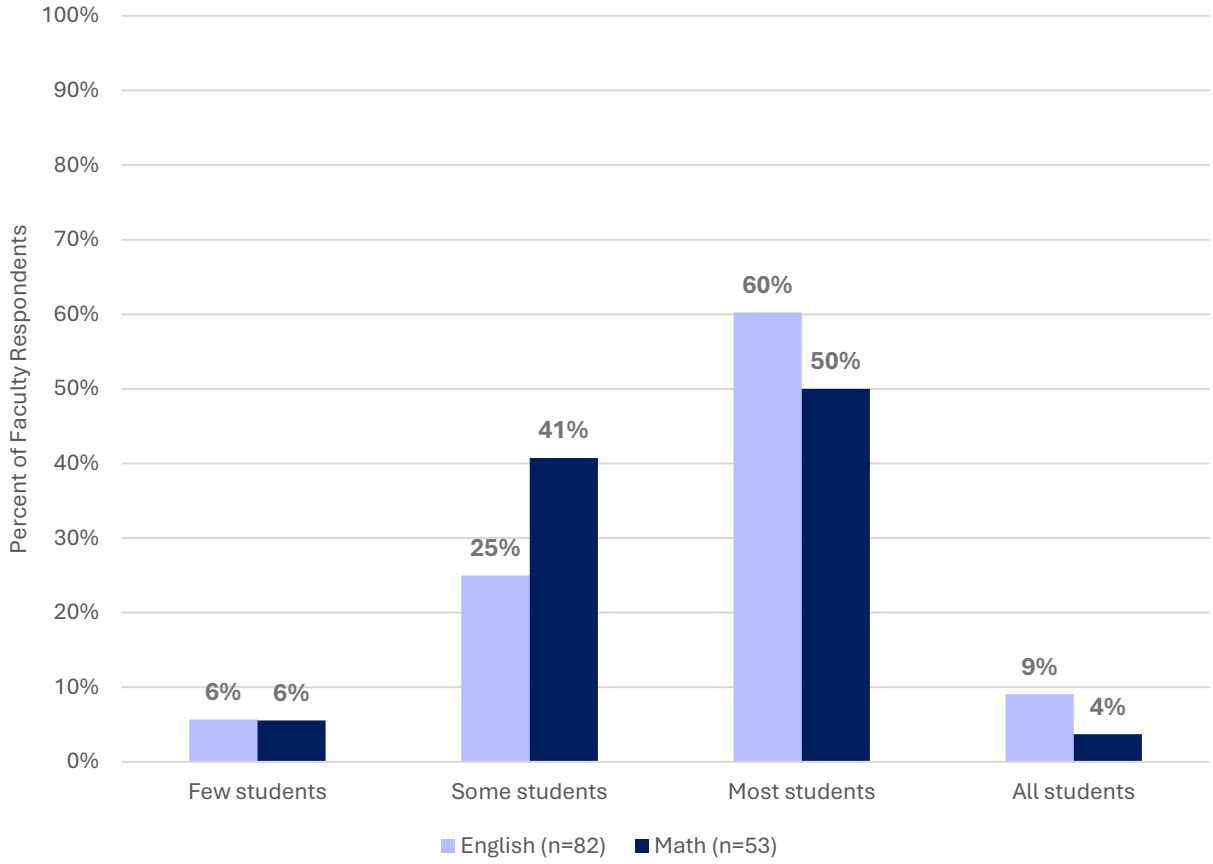
Our 2024 site visit data offer further insights into faculty support for these policies. Respondents at most site visit institutions (n=10) reported higher levels of support for AB 705 than 1705. This support for AB 705 may be due to the perception among faculty from both departments that there had previously been too many levels of remedial coursework, and that removing those developmental sequences helps many students. Consistent with our survey results, buy-in for both reforms tended to be higher among English faculty than math faculty. English faculty may be more likely to report support for AB 1705 because they typically perceived little change required in response to the reform, whereas math faculty perceived that their departments were targeted more specifically by AB 1705. They shared strong concerns about the implications of the reform, particularly before the December 2024 memo from the Chancellor's Office offered revised guidance about the reform.

Most of our site visits were conducted before the December 2024 memo; at the time, many institutions (n=6) anticipated eliminating Algebra, Trigonometry, and Precalculus courses, and five institutions had developed an innovative Precalculus course in response to the law. Several colleges (n=5) developed a corequisite course for Calculus 1, and in some cases Calculus 2, and a few expanded existing academic supports, such as tutoring.

Faculty perceptions of benefits for students

Our faculty survey sought perspectives on the share of students who are well-served by being placed into introductory, transfer-level coursework; these data are presented in Figure 8.

Figure 8. Faculty perceptions of the share of students well-served by being placed into introductory, transfer-level coursework (n=142 faculty)

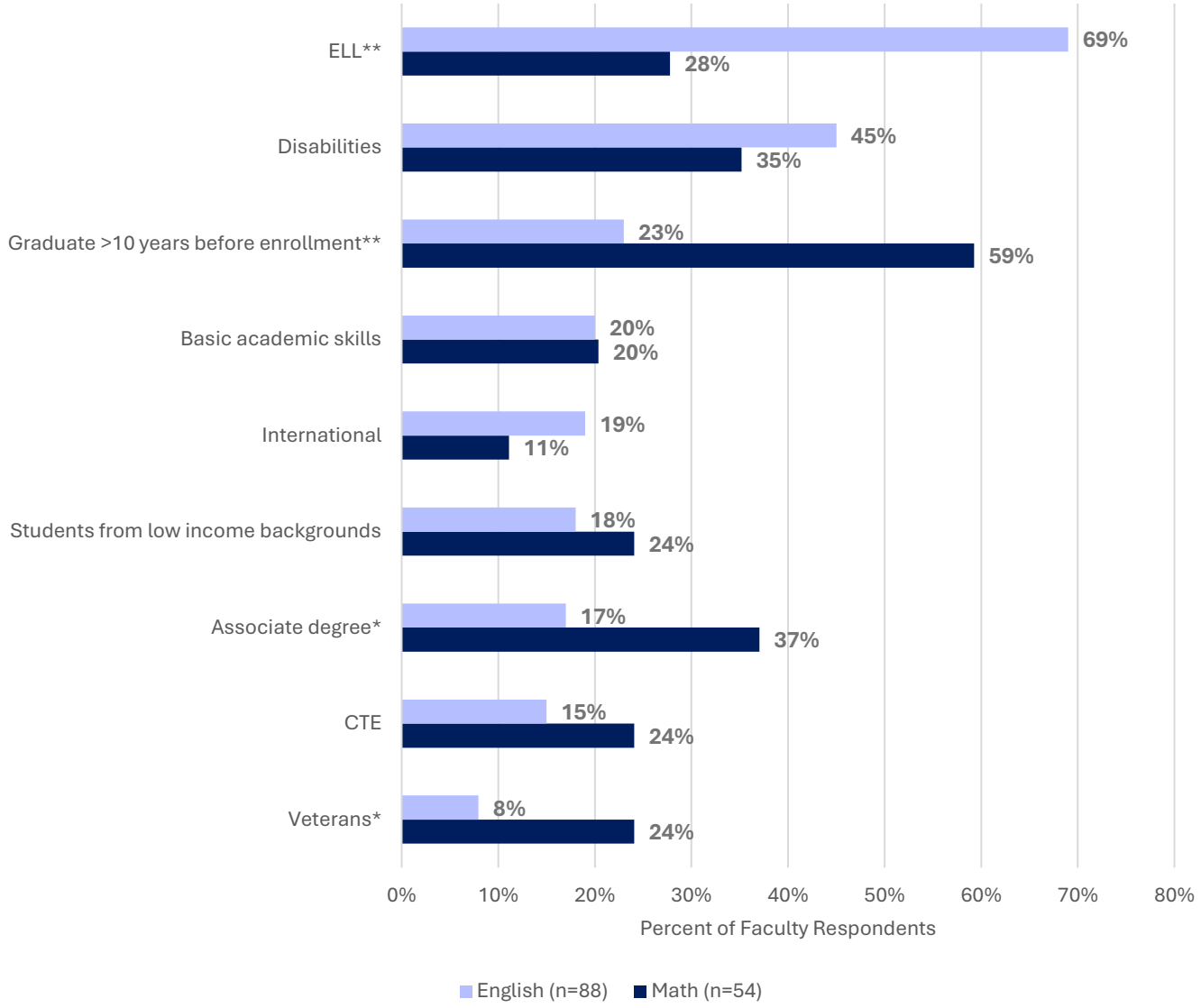


Perceptions of benefits for students of being placed into introductory, transfer-level courses are mixed. Few faculty reported that all students are well-served by the placement requirements of these reforms. At the same time, few faculty reported that only a few students benefit. Most faculty reported that either some or most students benefit, though perceptions of benefits are more reserved among math faculty. As shown in Figure 8, a smaller share of math faculty than English faculty reported that most or all students were well-served by being placed into introductory, transfer-level coursework, and a larger share reported that only some students are well-served by these reforms.

In interviews, we heard concerns from faculty regarding how these reforms would impact several student subpopulations. Those mentioned specifically by faculty included: students with disabilities, English Language Learners, first-generation students, and students returning to school after an absence. Respondents expressed concerns regarding short-term impacts and indicated that simply placing students into transfer-level courses without additional support is not enough, particularly for disproportionately impacted students such as Black and Native American male students. Faculty expressed concerns about how these reforms will impact student success in subsequent coursework. Faculty and administrators expressed the concern that AB 1705 was a disservice to students who struggle in math, have been away from it for a while, and students who are not planning to transfer to a four-year institution, such as CTE students.

Our survey asked faculty about student subgroups who may not be well served in introductory, transfer-level coursework. Figure 9 provides these data.

Figure 9. Faculty perceptions of student subgroups who may not be well-served by introductory, transfer-level coursework (n=142 faculty)



Note: Items with * show significant differences between departments at p<=0.05; items with ** show significance at p<=0.01

Math and English faculty differ regarding the student populations that they believe are not served by these reforms. English faculty were significantly more likely than math faculty to report that English Language Learners are not well served by placement into introductory, transfer-level coursework. This is perhaps not surprising given that these faculty are working closely with students to improve their reading and writing skills and might be more sensitive to students' lack of fluency with English. Conversely, a significantly larger share of math faculty than English faculty reported that students returning to school after an absence are not well served by these reforms. This is consistent with concerns that math faculty shared in interviews about students who have been away from the content for a long time and struggling to keep up. A significantly larger share of math faculty expressed concerns for students pursuing associate degrees and students who are veterans.

Data Use

A major theme that emerged in our site visit data was the extent to which colleges are engaging with their own data to understand the impact of reforms and to inform iterations of their implementation of AB 705 and AB 1705. While some colleges (n=3) are using data to inform iterations of their implementation of AB 705 and 1705 reforms, others (n=3) currently lack that capacity. Faculty at some (n=2) institutions expressed the desire to continue offering structures (e.g., corequisites, tutoring) despite data indicating that these structures are ineffective. Some colleges (n=4) shared challenges associated with identifying the impact of these reforms, including the lack of baseline data, multiple concurrent initiatives and policy mandates, and COVID. One institution has observed that student performance has declined in subsequent STEM courses post-reform.

We also heard that faculty can be reluctant to use their individual course success data and are not always incentivized to do so. Some institutions (n=3) struggle to provide accessible, actionable data to all instructors/departments. Some colleges are sharing disaggregated data regularly with stakeholders, and some require faculty to receive equity training before gaining access to these data.

Among institutions that are able to engage with their data, we heard many are seeing improvement in transfer-level course enrollment, throughput, and completion, in line with statewide results. While one institution reported that equity gaps are closing, others (n=3) indicated that they have persisted. Respondents' views on AB 1705's contribution to equity vary; some believe it was a needed change while others (n=2) believe it undermines equity or could result in inequitable impacts. Colleges noted that these reforms are helping more students complete math and English in their first year, however some institutions (n=2) noted that racially minoritized students are still having disproportionate outcomes.

Throughput among Latinx and Black students has increased at some institutions although success rates have dipped. Some colleges have seen improved outcomes for racially minoritized students in sections with embedded tutors and project-based learning opportunities. Puente sections show improved retention at some colleges. Some colleges are using data-driven insights to target interventions aimed at supporting Black and Latinx students struggling in math and online courses. Other faculty question the utility of disaggregating student success outcomes by race.

Resources leveraged to support implementation

Institutions have leveraged a range of resources -- human, financial, curricular, and technological -- to support AB 705 and 1705 implementation. In this section, we share insights from our site visit and survey data that describe how colleges have mobilized resources to support implementation. We find that institutions commonly use AB 1705 funds to support implementation of reforms through targeted initiatives such as embedded tutors or new staff positions. However, faculty report that aside from administrators, staffing levels are currently insufficient to support successful implementation. Faculty also report that additional resources would be helpful, particularly funding for faculty stipends and tutor salaries.

Financial supports for implementation

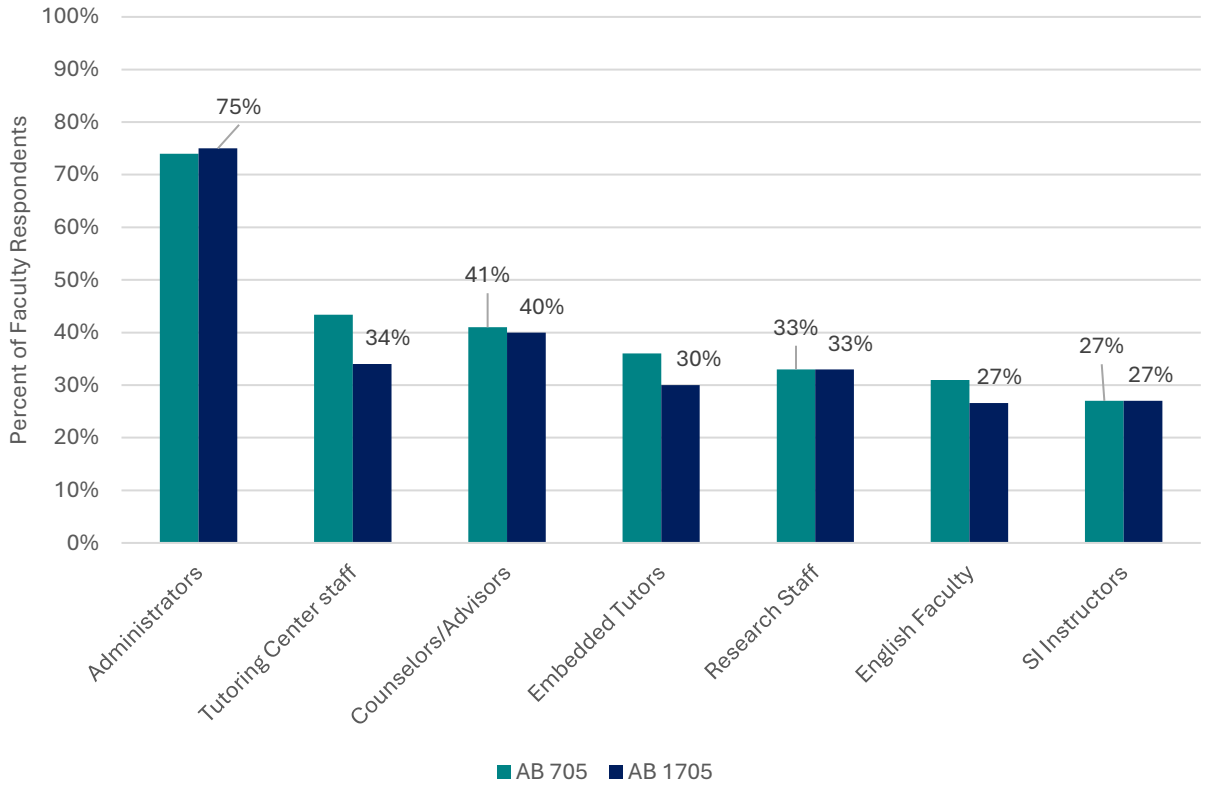
While AB 705 was criticized by many for being an "unfunded mandate", the CCCCO provided funds to institutions to support their implementation of AB 1705.

Institutions reported strategically leveraging these AB 1705 funds and related state funding streams to support embedded tutors (n=3), course redesign (n=3), and the creation of new student support roles (n=3). However, some institutions (n=2) reported challenges in spending funds efficiently due to short timelines, coordination issues, or restrictions on use.

Human Resources Needed to Sustain Instructional and Student Support

Across colleges, interview respondents highlighted the need for sufficient and specialized human resources—full-time faculty, embedded tutors, counselors, and coordinators—to implement AB 705 and 1705 reforms effectively. Figure 10 shows faculty reporting whether their institution had "enough" or "more than enough" staff needed to successfully implement reforms.

Figure 10. Faculty reporting that their institution has "Enough" or "More than Enough" staff needed to successfully implement reforms (n=135 faculty)



Items with * show significance at p<=0.05; items with ** show significance at p<=0.01

While faculty generally indicate that there are adequate administrators available to successfully implement reforms, survey results for other staff positions suggest unmet need. These findings align with our interviews with faculty, during which respondents reported staffing limitations, particularly in counseling (n=3). Indeed, only 40% of survey respondents report having "enough" or "more than enough" counselors to implement AB 1705. Interview respondents also reported limitations in instructional support roles (n=2), and faculty leadership (n=2). The expansion of embedded support models has been broadly embraced but often lacks sustainable funding and staffing to scale. Regarding AB 1705, only around 30% of survey respondents reported having enough instructional support staff to successfully implement reforms. Those roles included research staff (33%), tutoring center staff (34%), embedded tutors (30%), and SI instructors (27%).

Investments in Resources to support Implementation

Several colleges are investing in technology and curriculum tools to increase access and promote student success under AB 1705. In our site visit sample, a few institutions have adopted new placement systems (n=2), provided laptops and online tools (n=4), and expanded Open Educational Resource (OER) usage (n=3).

Figure 11 presents survey findings related to faculty perceptions of adequate resources to support implementation of reforms.

Figure 11. Faculty reporting that their institution has "Enough" or "More than Enough" resources to implement reforms (n=135 faculty)

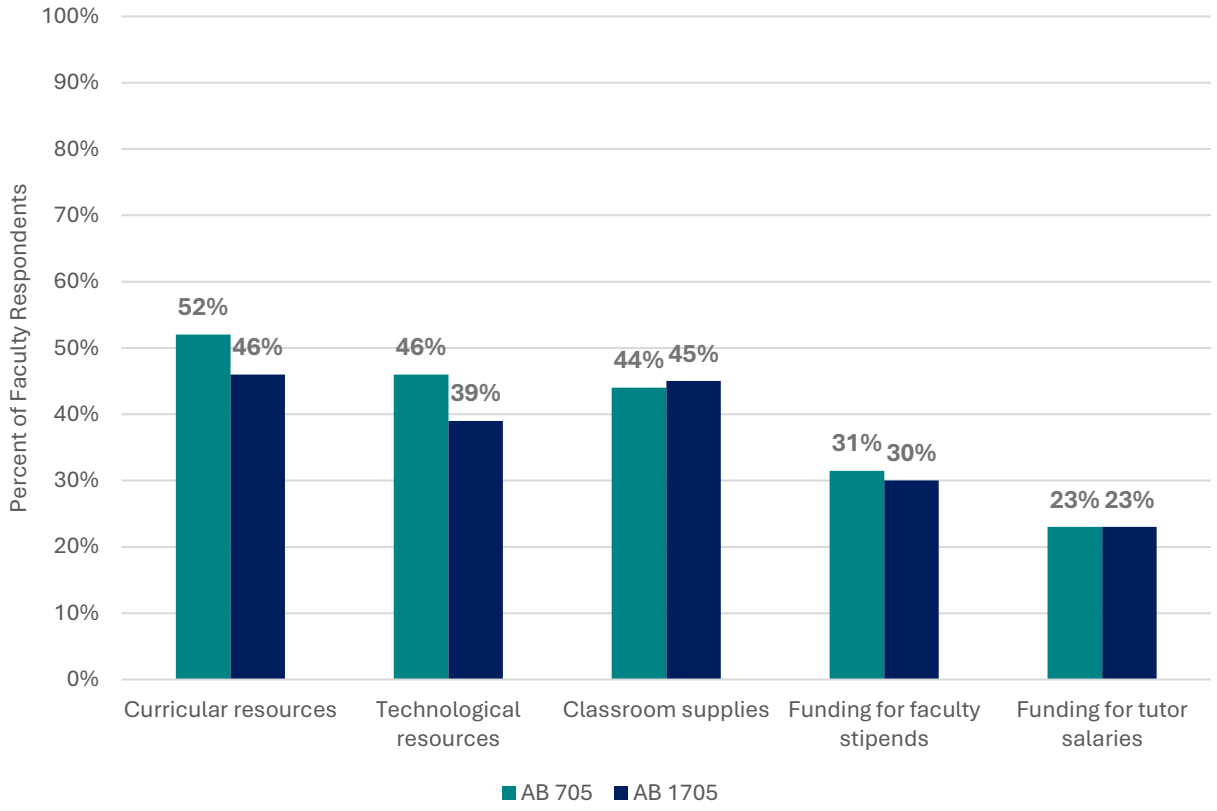


Figure 11 indicates that many faculty continue to find resources at their institutions to be inadequate to implement reforms. In fact, the availability of curricular and technological resources is slightly lower for AB 1705 than AB 705, despite targeted funding. Faculty reports of the adequacy of funding for faculty stipends and tutor salaries do not differ significantly between AB 705 and 1705. Similarly, faculty perceptions of adequate funding for classroom supplies between AB 705 and 1705 are not significantly different.

Equity

Another major theme that emerged in our study of the implementation of AB 705 and AB 1705 is how institutions are grappling with the equity goals of the policy. While some colleges have acknowledged that AB 705 and AB 1705 were designed to remove barriers, and have shifted campus policy and practice to address issues of equity, others have been slower in making changes or found change to be challenging in their campus environments. We find that many colleges are institutionalizing equity efforts through campus policies, though few colleges are employing their data to support these efforts. Many colleges are exploring equity-minded instructional practices in their math and English departments, although as noted earlier, these shifts are more common among English faculty than math faculty. We also find that English faculty may be more likely to espouse growth mindsets, which support these practices.

Institutionalized Equity Strategies to Address Equity Goals of Dev Ed Policies

Eight of the sample institutions reported some formalization of their equity efforts through strategies such as creating institutional structures and leadership to support equity. For example,

colleges have created organizational positions dedicated to equity, work groups focused on equity at institutional or departmental levels, and embedded equity into strategic plans and professional development. At least four colleges have developed equity plans with more intentionality to focus on specific student groups such as minoritized students and students with disabilities. Two colleges reported leveraging external resources such as state equity funding and grant funding to support institutionalizing equity through professional development for faculty and administrators, among other initiatives. An administrator from one of the sample institutions noted that they have publicly defined equity for their institution, and two colleges noted they had defined student equity. Another respondent from one of these colleges explained equity as "fair access, opportunity and advancement for all students, while working to address systemic barriers, especially those of race, ethnicity, socioeconomic status, disability, gender, language, and family background that prohibit student success." The remaining seven colleges in our site visit sample reported decentralized responses to the policies; these colleges are grappling with how to define and operationalize equity at the campus level, though they do have equity strategies and initiatives on their campuses and in their math and English departments that are focused on instructional practices and policies.

Data Driven Strategies to Address Equity

Some colleges employed data driven strategies to promote equity in instructional practices and policies. In at least four colleges, disaggregated student data is used at the institutional and/or department level to make targeted decisions. These data are used to better understand student performance and improve instruction, or to analyze service utilization to ensure college operations are supporting students who are most underserved. Other respondents noted that student data is available but underutilized.

Instructional and Program Supports to Address Equity

Some respondents noted that equity-focused instructional strategies, such as culturally responsive pedagogy and non-academic supports, have been implemented within departments and across their institutions, though implementation may be uneven. In at least seven colleges, academic shifts in math and English such as inclusion of culturally responsive pedagogy, flexible deadlines, and equity infused syllabi have been implemented to support outcomes for historically underserved students. While these colleges are generally moving in the direction of supporting equity in instruction, two respondents noted that implementation of culturally responsive strategies and other equity focused strategies to support students in the classroom are inconsistent across their math and English departments.

Although some colleges are making shifts in instructional practices, respondents at four colleges noted that math faculty in particular are finding it challenging or are resistant to changing their pedagogical practices in service of equity. As reported earlier, English faculty have been quicker to adopt culturally responsive pedagogy and equity-minded instructional practices. One respondent shared that English faculty are:

> *…incorporating more diverse texts and trying to be more inclusive in the classroom; trying to codify more of those diversity, equity, and inclusion strategies into the curriculum of record by choosing culturally relevant materials in class.*

Although math faculty reported higher levels of support for culturally responsive pedagogy on our 2024 survey (Figure 5) than they did on our 2022 survey, many still expressed skepticism about the applicability of these practices in the context of math. One respondent suggested that these faculty "don't believe in" equity work:

> *They believe that [it doesn't] matter if you're white, black… you treat everybody the same across the board, you give everyone the same resources, and those that are just left behind: they have to catch up.*

In addition to instructional supports, some colleges have implemented or expanded programs such as MESA, and Puente, and enhanced their basic needs structures. For example, one college has developed new programs of study to focus on Black and Latinx students and an Ethnic Studies program with new faculty hired to teach the Ethnic Studies courses.

Faculty mindsets

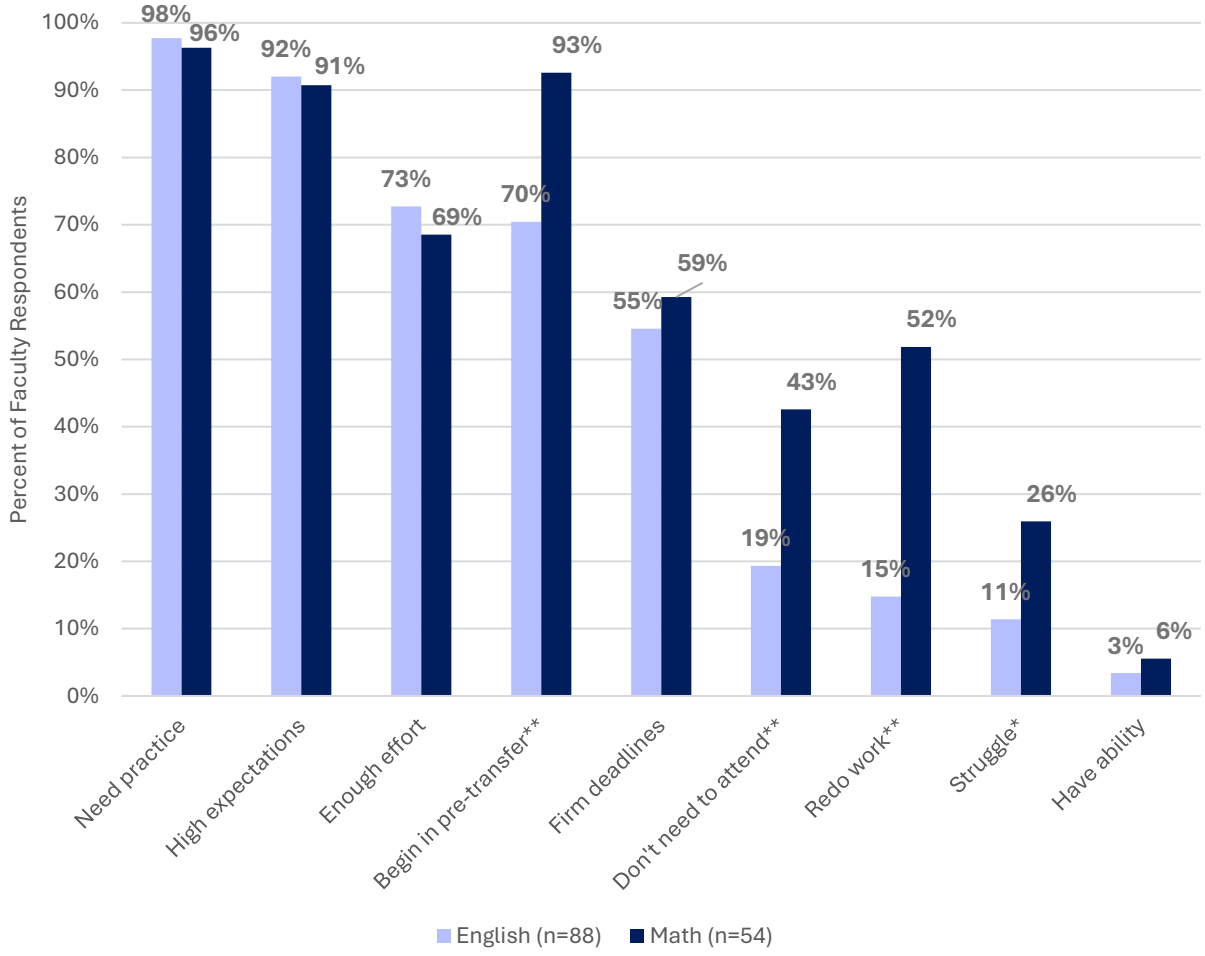
Implementing equity-minded practices can be strengthened by changing faculty mindsets about what students are able to do and promoting growth mindsets over fixed or deficit mindsets. **Respondents from eleven of the fifteen institutions reported that deficit mindsets persist among faculty.** Two respondents noted that it is more prevalent among long-tenured staff, and three highlighted that math faculty specifically held deficit mindsets of students at their colleges. One math faculty remarked, *"You can't just try to put everyone in a classroom and expect them to be successful, because somebody might not be good in math at all… if they don't have it, then there's nothing anyone can do."* Three institutions noted that in addition to faculty, other staff such as counselors continue to espouse this mindset.

Kroeper and colleagues (2022) identified four dimensions of faculty mindset: explicit messages about progress and success; opportunities for practice and feedback; instructor's responses to poor performance; and the value instructors place on student learning and development. To assess faculty mindsets in the context of developmental education reform in California, RFA developed a series of survey questions for faculty based on Kroeper et al (2022) that translated these behaviors into opinion statements:

a. If a student struggles in my course, it's an indication that they shouldn't be there.
b. People either have academic/math ability or they don't.
c. Firm deadlines for course assignments are important to help students develop time management skills.
d. It would be better for some students to begin in pre-transfer level coursework.
e. Students need opportunities to practice skills and get feedback.
f. Some students don't need to attend class in order to be successful.
g. If they put in enough effort, any student can pass my class.
h. Giving students too many opportunities to redo their work reduces the rigor of my course.
i. I have high expectations of my students.

Figure 12 presents the responses from math and English faculty to these survey questions. Collectively, survey findings indicate that there are some significant differences between math and English faculty mindsets.

Figure 12. Proportion of math and English faculty who "Agree" or "Strongly Agree" with faculty mindset survey questions (n=142 faculty)



Items with * show significance at p<=0.05; items with ** show significance at p<=0.01

As shown in Figure 12, **faculty reported mixed mindsets, with English faculty more likely to respond in ways that indicate a growth mindset**. The first construct, explicit messages about progress and success, is measured by survey items about effort and struggle (reverse coded). English faculty report higher levels of agreement with both items, but **math faculty are significantly more likely to report that seeing a student struggle in their courses indicates that the student should not be there.**

The second construct, opportunities for practice and feedback, is measured by survey items about opportunities for practice and redoing work (reverse coded). Here again, while math and English faculty both report high levels of agreement on students needing opportunities to practice, **math faculty are significantly more likely to report that giving students opportunities to redo their work reduces rigor**.

The third construct, instructors' responses to poor performance, is measured by survey items about beginning in pre-transfer level coursework (reverse coded), attending class (reverse coded), and having ability or not (reverse coded). **Math faculty are significantly more likely to report that some students should start in pre-transfer level coursework**, and that some students don't need to attend class to be successful. There were not significant differences between math and English faculty on the ability item.

The last construct, instructors' value of student learning and development, is measured by survey items about high expectations and firm deadlines (reverse coded). Both math and English faculty report that they hold their students to high standards, and there was no significant difference between math and English faculty with regard to firm deadlines.

Professional Development and Technical Assistance

The last theme we identified in the data involved professional development and technical assistance, which colleges are mobilizing to support faculty in response to AB 705 and 1705 and often funding this training with money earmarked for equitable placement reform. We consider professional development and technical assistance to be a component of institutional capacity supporting these reforms. Overall, our analysis indicated that most colleges are using AB 1705 funds to support professional development for faculty, and in some cases administrators and counselors, to support their adoption of growth mindsets and equity-minded instructional practices. However, because participation is often voluntary, these opportunities may not reach all who could benefit. Survey findings suggest that faculty perceive that there is a need for additional guidance, professional development, and planning time, particularly to support implementation of AB 1705.

Professional development for faculty

Most colleges (12 out of 15) offered learning and professional development opportunities for faculty to support changes in their work associated with AB 705 and AB 1705. For example, the University of Southern California's Equity Minded Teaching Institute was a popular training engagement for faculty across several colleges. Attendance by faculty was sponsored by the colleges from which faculty attended. Other college-sponsored supports included equity training and pedagogy workshops to implement instructional strategies, in addition to funding support provided through AB 1705. Faculty were empowered to take leadership roles in professional development activities at most colleges through facilitation and engagement in communities of practice, professional learning communities, department-sponsored workshops and retreats, and regular convenings/meetings.

Voluntary participation, rather than mandated participation in equity training, showed challenges with uptake among faculty at several colleges. Participation in equity training is not required but is encouraged and sometimes "highly incentivized" for faculty and counselors alike at several colleges; faculty at these institutions also desired more opportunities than were available during Fall 2024 and early Spring 2025. Without consistent and context-specific support for instructors, professional development risks becoming an added burden rather than a meaningful tool for improvement.

Focus areas for professional development

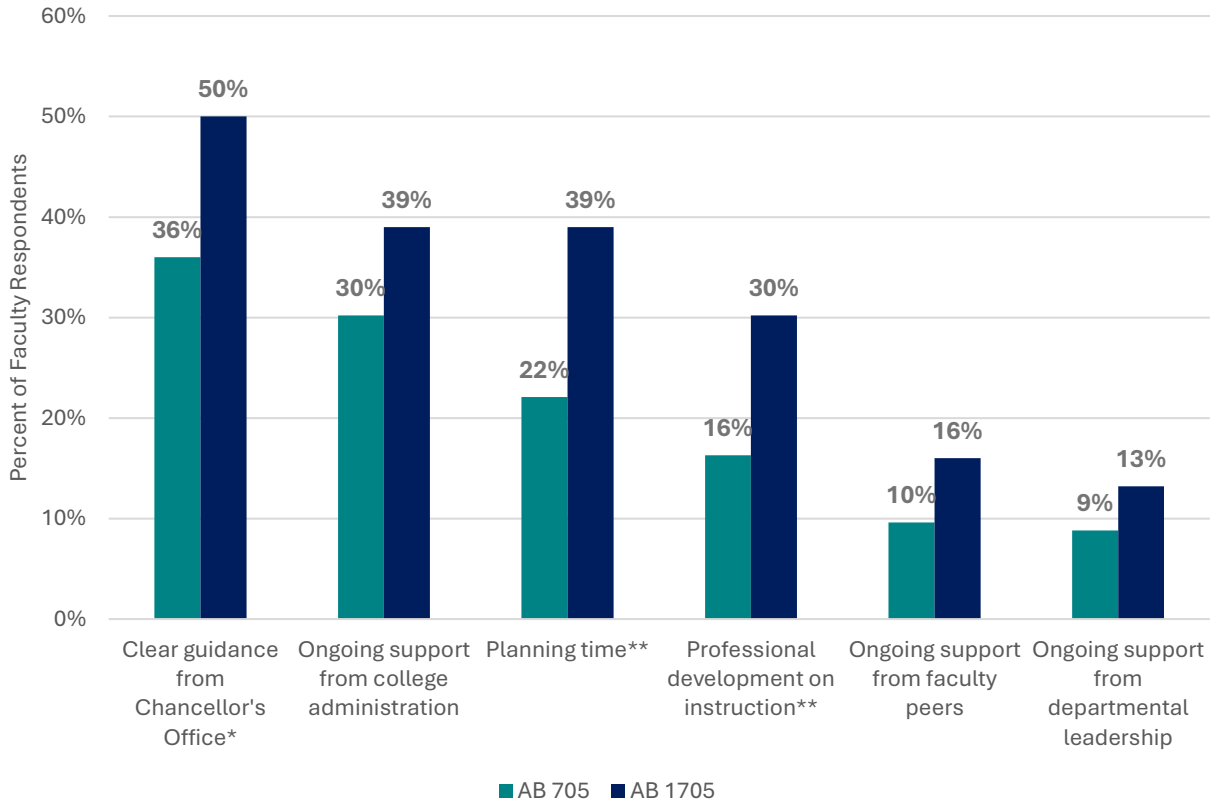
Faculty engaged in some form of equity training at 13 out of the 15 colleges. Faculty participated in learning programming related to equitable teaching practices and/or culturally responsive pedagogy through various forms of professional development training sessions, communities of practice, external conferences, and working groups. Culturally responsive professional development was offered online and in-person across institutions and formats. Some faculty noted that culturally responsive training helped "[them] to understand that [these] practices are not new". Training in the equitable use of disaggregated student outcomes data was provided to faculty at several colleges.

Several colleges (4 out of 5) sponsored professional development for counselors in response to AB 1705 implementation. Counselors at 4 colleges reported participation in college-supported professional development activities such as regular meetings or convenings to discuss problems of practice, corequisite placement training in the context of AB 1705, and in-service trainings. However, counselors at several colleges say the training they received could have been more closely aligned with the competencies of their roles relative to AB 1705 reforms.

Faculty perceptions of supports provided

To better understand faculty experiences of the professional development and technical assistance that colleges offered to support the implementation of DE reform in California, we asked faculty to reflect on their perceptions of adequacy of supports in our faculty survey. Figure 13 shows the share of faculty who responded that the supports they received from various sources were "nowhere near enough" to successfully implement reforms.

Figure 13. Faculty reporting that their institution has "Nowhere Near Enough" supports to successfully implement reforms (n=135 faculty)



Note: Items with * show significance at p<=0.05; items with ** show significance at p<=0.01

We found that faculty perceptions of adequacy were mixed depending on source of support, with a smaller share of faculty feeling that supports from departmental leadership and faculty peers were not enough (between 9-16%) compared to guidance from CCCCO and college administration between (30-50%).

Additionally, **faculty reported less support, across all indicators, for implementing AB 1705 than they did during AB 705.** Most notably, roughly 1 in 5 (22%) respondents said there was not enough planning time for AB 705, but a significantly greater proportion (39%) said there was not enough planning time for AB 1705. Half of respondents (50%) said they had "nowhere near enough" guidance from the Chancellor's office for implementing AB 1705, whereas one third (36%) said the same about AB 705. A significantly larger share of responding faculty reported "nowhere near enough" support for professional development on instruction under AB 1705.

Implementation Study Summary

Collectively, these data help us understand how California's community colleges are implementing curricular reforms. Our fieldwork suggests that most institutions are still experimenting with cocurricular support structures, including corequisites and enhanced courses, often embedding tutors in those courses to support student success. Many colleges are still struggling to target these supports effectively, as most do not require any students to enroll in corequisite-paired courses. Indeed, most of our sample institutions did not believe the law permitted them to do so. While embedded counseling is a less common support, those utilizing that approach suggest that it may be a promising practice. AB 705 and 1705 have prompted many faculty to re-examine their instructional approaches and adopt equity-minded practices. Equitable Placement funds are often being utilized by colleges to provide professional development aimed at improving faculty's familiarity and comfort with implementing equity-minded classroom practices.

Colleges are seeing increases in enrollment, throughput, and completion, mirroring statewide results, and some are seeing equity gaps closing. However, colleges vary in their use of campus data to support implementation. There is some resistance among faculty to engage with their success data, and some institutions struggle to provide accessible, actionable data to departments. More support may be needed to help institutions use their data to inform their implementation efforts, increase faculty buy-in for these reforms, and improve student outcomes.

We observed many salient differences between math and English departments in how they have implemented these reforms, often related to differences between the departments in institutional capacity and faculty buy-in. Findings indicate that support for AB 705 is higher for both math and English faculty than support for AB 1705, and that support for both reforms is significantly higher among English faculty than math faculty. It is worth noting that the number of math and English faculty indicating that "most students" are well served by being placed into transfer-level coursework increased from last year's survey administration (Burkander et al., 2024b). There are significant differences between English and math faculty in perceptions of the effectiveness of instructional approaches and equity-minded practices, and English faculty appear more likely than math faculty to espouse growth mindsets. Additionally, we heard significant concern from math faculty anticipating the need to eliminate the prerequisites to Calculus before the release of the December 2024 memo; many expressed the fear that these changes would have dire impacts on STEM students' retention and future success. Because most of our site visits were completed before the memo's release, we have little information about how colleges have responded to the policy change.

Impact Study

In this section of the report, we provide a comprehensive and methodologically rigorous assessment of AB 705's impact, contributing unique insights into how developmental education reform has reshaped access, equity, and student success in California's community colleges.

Our impact study is designed to assess the effects of AB 705 on student success and provide estimates of the impact of these reforms, guided by the following research questions:

Impact Study	Research Question	Details
	RQ3	What is the impact of transfer-level placement, compared with placement into a prerequisite DE math or English course, on both short- and long-term student outcomes?
	RQ4	What is the overall impact of the AB 705 policy on student outcomes (e.g., transfer-level math passing rate in the first year)? Does the effect of AB 705 vary across students with high, middle, and low high school achievement?
	RQ4a	Does the overall policy effect vary across different socio-demographic student groups?

To address RQ3, we employed two analytic approaches:

- **Inverse Probability Weighted Regression Adjustment (IPWRA):** This approach to RQ3 estimates average treatment effects using inverse probability weighting combined with regression adjustment. The doubly robust IPWRA approach strengthens causal inference by addressing both selection bias and model misspecification. Results are disaggregated by subject area (math and English) and tracked over four years to assess both one-year and cumulative four-year impacts on credit accumulation, GPA, credential attainment, and transfer to four-year universities.
- **Difference-in-Differences (DiD)-Inspired Approach:** This analysis complements our understanding of RQ3, adapting a difference-in-differences framework to estimate the impact of AB 705 by comparing student outcomes before (fall 2017) and after (fall 2019) full policy implementation, using variation in baseline academic readiness to construct "high-exposure" (treated) and "low-exposure" (control) groups. By comparing changes in outcomes before and after the reform between the control and treated groups, we estimate the DiD impacts of the reform on transfer and below transfer-level course enrollment, GPA, degree attainment, and transfer to four-year university outcomes within one- and four-year periods.

To address RQ4 and 4a, we employed the following analytic approach:

- **Interrupted Time Series (ITS) Analysis:** This analysis explores the overall impact of AB 705, specifically how first-year outcomes (e.g., enrollment in and passing of transfer-level math and English) changed over time, focusing on pre- and post-AB 705 cohorts of first-time-in-college (FTIC) students. By comparing observed post-reform outcomes to pre-reform trends, we estimate the average effect of AB 705 for each of post-reform cohorts. The ITS models also explores whether policy impacts vary by students' high school academic achievement levels, race/ethnicity, and gender.

To address the research questions, we used data from the Chancellor's Office Management Information System (COMIS), which contains longitudinal records for the entire population of California community college students.[6] The dataset includes enrollment, demographics, credit accumulation, course grades, credential attainment, and financial aid data from 106 California community colleges from academic years 2014–15 through 2022–23. Using these data, we constructed a sample of nine first-time-in-college (FTIC) student cohorts who entered California public community colleges between fall 2014 and fall 2022. This sample includes four pre-AB 705 cohorts (fall 2014–2017), one rollout cohort (fall 2018), and four post-AB 705 cohorts (fall 2019–2022). Students in the sample were enrolled in at least one credit during their first fall semester; those attending the three quarter-system colleges were excluded. Each analysis draws its analytic sample from different segments of this full cohort.

Table 4. Number of FTIC students by cohort

	College entry year of FTIC students in fall cohort								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total Enrollment	105,304	102,532	94,728	95,389	93,844	102,623	85,778	95,793	105,202
Number of Colleges	106	106	106	106	106	106	106	106	106

Note. Table 4 reports the number of FTIC students for fall 2014 through fall 2021 cohorts.

Impact Study Results

RQ3: What is the impact of transfer-level placement, compared with placement into a prerequisite DE math or English course, on both short- and long-term student outcomes?

To address this question, we employed two analytic strategies: one to estimate both average associations between taking a transfer-level course and student outcomes using inverse probability weighted regression adjustment (IPWRA), and the other to estimate the differential effects of the AB705 policy across students with varying levels of academic readiness using a difference-in-difference (DID) design. Below, we summarize findings from both approaches. Taken together, we provide a comprehensive picture of how transfer-level enrollment shapes student outcomes for two different analytic samples of students, bolstering support for the robustness of our findings.

Analytic Strategy: Inverse Probability Weighted Regression Adjustment to Estimate Average Treatment Effects (ATE)

To assess the relationship between first-semester, transfer-level course enrollment and student outcomes, we first used inverse probability weighted regression adjustment (IPWRA). We estimated students' likelihood of enrolling in transfer-level courses using logistic regression and then used these predicted probabilities to assign inverse probability weights. We then specified weighted regression models, with additional covariates and college fixed effects, to estimate adjusted outcomes under each condition. The IPWRA method offers a "doubly robust" estimator—producing unbiased results if either the treatment or outcome model is correctly specified (Słoczyński, et al., 2022). We verified the validity of this approach by testing covariate balance after weighting, using standardized mean differences (*SMD*s), and adjusted for any

[6] For the purposes of these analyses, we exclude two California community colleges from our full sample: Calbright College and Madera College, because neither were approved for in-person instruction in Fall 2017.

remaining imbalances, as recommended by the What Works Clearinghouse for matching techniques (WWC, 2022).

Data and IPWRA Analytic Sample

We supplemented the COMIS dataset with data from CCCApply,[7] which provides self-reported high school GPAs, and data from the California Department of Education (CDE), which includes high school course enrollment records and California Assessment of Student Performance and Progress (CAASPP) test scores. Student identifiers (e.g., Social Security numbers, names, and birthdates) in the CDE dataset were used to link it with the COMIS data. After linking, the identifiers were replaced with anonymous IDs to generate an anonymized dataset for analysis.

We focused on first-time students who entered college in Fall 2018—a year when colleges were in the early stages of rolling out AB705 and students could therefore have had access to either a transfer-level or below-transfer level course—and took at least one math or English course in their first semester. Our analytic sample included students at colleges that offered both below-transfer-level and transfer-level courses in math or English. We excluded students unlikely to be subject to AB705, including those with prior college experience (e.g., dual enrollment), those enrolled at adult-serving institutions, and those aged 65 or older. We further restricted the sample to students with available high school academic achievement data to allow us to account for academic preparation. From this subset, we constructed two overlapping analytic samples: (1) students who took any math course (but not necessarily English) in their first semester; and (2) students who took any English course (but not necessarily Math) in their first semester. Our final analytic sample includes 19,576 students in math and 24,135 in English.

IPWRA Findings

Together, the findings presented below highlight consistent and positive associations between early enrollment in transfer-level math and English courses and academic momentum, credential attainment, and transfer outcomes, based on our IPWRA analyses. Table 5 and Table 6 present estimated Average Treatment Effect (ATE) associations between early access to transfer-level courses and student outcomes, separately for the math and English subsamples.

Table 5. Relationship between math transfer-level course taking and outcomes 1 and 4 years after first enrolling in a math course (IPWRA) (n=19,576 students)

	Within 1 Year	**Within 4 Years**
Outcome	Adjusted *ATE* (*SE*)	Adjusted *ATE* (*SE*)
Passed a transfer-level math course	0.357*** (0.018)	0.265*** (0.015)
Number of below-transfer-level math credits attempted	-5.767*** (0.105)	-6.470*** (0.132)
Number of transfer-level math credits attempted	4.341*** (0.086)	4.495*** (0.210)
Number of transfer-level math credits earned	2.249*** (0.096)	2.469*** (0.155)
Cumulative college GPA	0.139*** (0.018)	0.205*** (0.024)
Earned any community college credential	<0.001 (0.001)	0.063*** (0.011)
Earned a certificate	<0.001 (0.001)	0.035** (0.010)
Earned an associate degree	0.001 (<0.001)	0.059*** (0.011)
Transferred to a four-year university	0.008* (0.003)	0.083*** (0.012)

Note. The table presents estimates obtained using inverse probability weighted regression adjustment. All models controlled for first-term measures, such as first-semester full-time status, GPA, and credits attempted, to account for early-college predictors of subsequent academic success. We also incorporated covariates from the treatment model into the outcome models, particularly variables that did not meet baseline equivalence (i.e., race, parents' highest education level, highest-level HS math course, grade in

[7] CCCApply is the statewide online admission application center for California Community Colleges.

highest-level HS math course, math CAASPP test z-score, educational goal) but were considered acceptable with adjustment (for both unweighted and weighted regression to facilitate comparison between the two models). College fixed effects were also included in the model.

*** $p < 0.0001$, ** $p < 0.001$, * $p < 0.01$

Results from the IPWRA models show strong positive associations between first-term enrollment in transfer-level math and various short- and long-term student outcomes (see Table 5). Within one year, students who began in transfer-level math were more likely to have better course-level outcomes than their peers in below-transfer-level math, including a substantially higher probability of passing a transfer-level math course. These students also made greater academic progress in math over time: By year four, they attempted an average of 4.5 more transfer-level math credits and earned 2.5 more transfer-level credits than their below-transfer-level peers. They also posted higher GPAs in both year one and year four after initial enrollment, reflecting broader academic momentum.

Transfer-level math enrollment was further associated with long-term credential attainment and transfer. Although no clear association with credential attainment appeared in the first year, students who started in transfer-level math were 3.5 percentage points more likely to earn a certificate and 5.9 percentage points more likely to earn an associate degree within four years. In terms of transfer outcomes, they were 0.8 percentage points more likely to transfer to a four-year university in the first year and 8.3 percentage points more likely by year four. These patterns point to cumulative benefits of early enrollment in transfer-level math on educational attainment and transfer success.

Table 6. Relationship between English transfer-level course-taking and outcomes 1 and 4 years after first enrolling in an English course (IPWRA) (n=24,135 students)

	Within 1 Year	**Within 4 Years**
Outcome	Adjusted *ATE* (*SE*)	Adjusted *ATE* (*SE*)
Passed transfer-level English course	0.286*** (0.011)	0.188*** (0.011)
Number of below-transfer-level English credits attempted	-4.415*** (0.089)	-4.541*** (0.097)
Number of transfer-level English credits attempted	2.920*** (0.076)	1.851*** (0.133)
Number of transfer-level English credits earned	2.075*** (0.061)	1.383*** (0.082)
Cumulative college GPA	0.101*** (0.020)	0.158*** (0.028)
Earned any community college credential	0.003 (0.001)	0.086*** (0.013)
Earned a certificate	0.002 (0.001)	0.043*** (0.011)
Earned an associate degree	0.001*** (<0.001)	0.085*** (0.013)
Transferred to a four-year university	0.006** (0.002)	0.079*** (0.014)

Note. The table presents estimates obtained using inverse probability weighted regression adjustment. All models controlled for first-term measures, such as first-semester full-time status, GPA, and credits attempted, to account for early-college predictors of subsequent academic success. We also incorporated covariates from the treatment model into the outcome models, particularly variables that did not meet baseline equivalence (i.e., race, parents' highest education level, highest-level HS math course, grade in highest-level HS math course, math CAASPP test z-score, educational goal) but were considered acceptable with adjustment (for both unweighted and weighted regression to facilitate comparison between the two models). College fixed effects were also included in the model.

*** $p < 0.0001$, ** $p < 0.001$, * $p < 0.01$

As shown in Table 6, similar patterns emerged for English. Students who enrolled in transfer-level English courses attempted nearly three more transfer-level credits and earned two more transfer-level credits within the first year, compared to their peers in below-transfer-level English. Although gains in cumulative credits continued over time, the size of the gap narrowed: By year four, transfer-level English students had attempted 1.9 more and earned 1.4 more transfer-level credits. GPAs were 0.1 points higher in year one and 0.16 points higher in year four among the transfer-level English group. In terms of long-term

credential attainment, these students were 4.3 percentage points more likely than their below-transfer-level peers to earn a certificate and 8.5 percentage points more likely to earn an associate degree by year four. Students enrolled in a transfer-level English course were also more likely to transfer to a public university in California.

Analytic Strategy: Difference-in-Difference-Inspired Approach to Estimate Average Treatment on the Treated Effects (ATT)

To complement the above analysis, we sought to identify the effects of increased access to transfer-level courses in the first semester of college using a difference-in-difference approach, analyzing both immediate (same semester) and long-term (up to four years later) college outcomes. Since AB 705 was implemented simultaneously across all California community colleges, we lack natural treated and control groups with varying exposure to the policy and, in particular, access to transfer-level math and English courses. To address this, we leverage differences in policy exposure based on students' baseline academic readiness and their likelihood of enrolling in a transfer-level course before the policy. This model assumes that students with high academic readiness, who were already likely to enroll in a transfer-level course, would have done so regardless of AB 705 and were thus less likely to be affected by the policy. In contrast, students with lower readiness, who were unlikely to enroll in a transfer-level course pre-policy, were the most likely impacted by the reform's efforts to expand access to transfer-level courses. We designate the former group as the low-policy exposure group and the latter as the high-policy exposure group. We leverage the low-policy exposure group as a comparison group in a standard difference-in-differences framework (i.e., we can use the difference between pre- and post-policy outcomes within the low-policy exposure groups to understand how policy affects the high-policy exposed students). We conducted a biannual analysis while skipping the rollout period of 2018, defining the pre-policy cohort as those who entered college for the first time three semesters before when AB 705 took effect in January of 2018, and the post-policy cohort as those who enrolled for the first time after its statewide adoption in the fall of 2019. We follow the groups to capture outcomes up to four years after entry (through 2023, the most recently available outcome data).

Comparing each group of students across the pre- and post-policy period allows us to identify the effect of access to transfer-level courses (in math and English, separately) on the outcomes for the high-exposure students (treatment effect on the treated). Unlike the IPWRA analysis discussed in the previous section, in this analysis, we compare students from different cohorts who would have been differentially affected by the impact of the Covid-19 pandemic. Specifically, the fall 2017 entrants' first-year outcomes would be independent of the pandemic, while those of the 2019 fall entrants may include the impact of the pandemic in their Spring semester. For that reason, in this analysis, we assessed the short-term (1-year) outcomes separately for the fall and the spring semesters, which is a different approach than we took in the IPWRA.

To implement the DID strategy, we first specified a linear probability model of first semester, transfer-level math and English course enrollment, separately, for students who entered college in the fall of 2017. Then, using the estimated parameters, we calculated predicted probabilities of transfer-level course enrollment in 2017 for students in both the 2017 and 2019 cohorts. Students whose propensity scores were above the median of those who enrolled in a transfer-level course at the same college in 2017 were classified as the low-policy exposure—or high-propensity for transfer-level enrollment—group. Students with propensity scores below the median of students who did not enroll in a transfer-level course were classified as the high-policy exposure—or low-propensity score—group. Students who did not meet either of these classifications were grouped into a middle tier of academic readiness.

Since students experience their first year of college only once, we used a repeated cross-sectional design, analyzing samples consisting of different students for each academic year. The difference-in-differences analysis was carried out using linear regression models that controlled for a wide range of student-level covariates including demographic backgrounds and high school academic measures, as well as college fixed

effects. We performed various robustness checks to ensure that the key identifying assumptions, such as no compositional change across treatment-cohort pairs and no preexisting trends in outcomes across treatment groups, were satisfied.

Note that unlike in the classic difference-in-differences framework, where the estimated treatment effect reflects the difference in outcomes before and after the policy for the students affected relative to those who were not, here we compare students who were more affected by the policy and those who were less affected. As a result, our estimates should be interpreted as capturing the differential effect of access to the transfer-level course across groups with varying levels of exposure and may represent a lower bound on the true effect of AB 705 on the high-policy exposure students.

Difference-in-Differences Inspired Approach Sample

We again utilized the COMIS data supplemented with CCCApply and CDE data to answer this question. We focused on first-time California community college students who entered college in the fall semesters of 2017—just before AB 705 took effect in January 2018—and 2019—immediately after its mandated curricular reforms were implemented. Among the students in those cohorts who took a math and/or English course in their first fall semester of college, we constructed two overlapping analytic samples: 1) students who took any math course (but not necessarily English) in their first semester; 2) students who took any English course (but not necessarily math) in their first semester.

To meet the needs of our analytic strategy, we focused on the community colleges that offered both transfer-level and below transfer-level math and/or English courses in 2017, as we could not measure the probability of transfer-level course placement for students from colleges that did not offer both types of courses. These 105 (math) and 106 (English) colleges together represent about 95% of the 111 community colleges that were represented in our analytic sample of first-semester math or English course-taking students at the start of the study period. We found no systematic differences in observed institution-level characteristics, other than the transfer-level course offerings, between the excluded colleges and those included in our analysis.

Moreover, we excluded an additional 18 colleges from each of the math and English samples that were not represented in our sample for both periods, as students from these colleges did not have an appropriate comparison group. After further restricting the sample to students relevant to our analysis by excluding those over age 65, those who only took below-high school-level courses, or those with insufficient data, our final analytic sample consisted of 32,260 students for the math sample ($N_{2017} = 15{,}829$, $N_{2019} = 16{,}431$) and 42,462 students for the English sample ($N_{2017} = 18{,}292$, $N_{2019} = 24{,}170$). After predicting students' propensities to enroll in a transfer-level course in Fall 2017, as discussed in the previous section, and classifying each cohort into the high- and low-policy exposure groups, we dropped the students in the middle of the academic readiness distribution who could not be clearly classified. Thus, we focused our analysis on the 18,267 ($N_{2017} = 8{,}743$, $N_{2019} = 9{,}524$) students at the top and bottom of the distribution in math and the 31,698 ($N_{2017} = 13{,}711$, $N_{2019} = 17{,}987$) students at the top and bottom in English. To assess the impact of excluding the students in the middle group, we conducted an additional analysis including all students, using estimated probabilities of transfer-level course enrollment instead of a binary treatment indicator. The results remained consistent in direction and very close in statistical significance to the binary analysis presented here.

DiD-Inspired Findings

Together, our estimates of the Average Treatment on the Treated (ATT) suggest that allowing students at the lower end of the academic readiness spectrum to access transfer-level courses led to higher degree-bearing credit accumulation and, in the long-term, enhanced their probability of transferring to a public university. Although these results are not directly comparable to the ATE estimates from our IPWRA analyses, due to their focus on different sample populations and observation periods, they illustrate that the effects are in the

same direction for students with the greatest academic needs as for the overall student population. Tables 7 and 8 present the estimated effects of shifting transfer-level course access via AB 705, which aimed to increase access to transfer-level courses for students at the lower end of the academic readiness distribution, separately for the math and English subsamples. Parameter estimates below represent the effect of transfer-level course access for "high-policy exposure" students (i.e., "treatment on the treated"). Control means are included as well.

Table 7. Relationship between transfer-level math course access and students' short- and longer-term academic outcomes (*ATT* effects, DID-inspired) (n=18,267 students)

	Fall Semester		**Spring Semester**		**Within 1 Year**		**Within 4 Years**	
	Treated × Post-reform	Control Mean (N=6,211)	Treated × Post-reform	Control Mean (N=6,211)	Treated × Post-reform	Control Mean (N=6,211)	Treated × Post-reform	Control Mean (N=6,211)
Outcome	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Took transfer-level math course	0.284*** (0.040)	0.923 (0.267)	0.142*** (0.016)	0.393 (0.489)	0.413*** (0.037)	0.950 (0.217)		
Passed transfer-level math course	-0.062* (0.019)	0.582 (0.493)	0.069*** (0.013)	0.251 (0.433)	0.050 (0.019)	0.669 (0.471)	0.088*** (0.015)	0.766 (0.424)
Number of below-transfer-level math credits attempted	-0.669** (0.170)	0.572 (1.405)	-1.241*** (0.088)	0.152 (0.771)	-1.914*** (0.226)	0.723 (1.76)	-3.449*** (0.246)	0.928 (2.14)
Number of transfer-level math credits attempted	1.015*** (0.165)	3.812 (1.356)	0.610*** (0.082)	1.888 (2.613)	1.637*** (0.202)	5.700 (3.134)	2.548*** (0.266)	9.386 (7.522)
Number of transfer-level math credits earned	-0.188 (0.084)	2.666 (2.059)	0.370*** (0.066)	1.260 (2.274)	0.291 (0.114)	3.926 (3.288)	0.954*** (0.171)	6.426 (6.213)
College GPA	-0.256*** (0.062)	2.606 (1.323)			0.075 (0.134)	2.533 (1.412)	0.041 (0.082)	2.525 (1.397)
Earned any community college credential					<0.001 (0.002)	0.008 (0.087)	0.035* (0.011)	0.313 (0.464)
Earned a certificate					<0.001 (0.001)	0.004 (0.066)	0.016 (0.012)	0.192 (0.394)
Earned an associate degree					-0.001 (0.001)	0.004 (0.063)	0.037** (0.011)	0.286 (0.452)
Transfer to a 4-year university					0.002 (0.003)	0.013 (0.113)	0.075*** (0.014)	0.261 (0.439)

Note. The table presents results from two-way fixed effects regression models. Columns (1), (3), (5) and (7) provide the average treatment effects on the treated (*ATT*s), and Columns (2), (4), (6) and (8) show post-policy means for the control group. All models controlled for first-term measures, such as first-semester full-time status and GPA, and the amount of grants or scholarships received in the first year (for short-term outcomes) or through year four (for long-term outcomes). We also incorporated predictors of transfer-level course enrollment (i.e., race, parents' highest education level, highest-level HS math course, grade in highest-level HS math course, math CAASPP test z-score) and college fixed effects. The standard errors are clustered by college.

*** $p < 0.0001$, ** $p < 0.001$, * $p < 0.01$

Table 8. Relationship between transfer-level English course access and students' short- and longer-term academic outcomes, (*ATT* effects, DID-inspired) (n=31,698 students)

	Fall Semester		**Spring Semester**		**Within 1 Year**		**Within 4 Years**	
	Treated × Post-reform	Control Mean (N=15,566)	Treated × Post-reform	Control Mean (N=15,566)	Treated × Post-reform	Control Mean (N=15,566)	Treated × Post-reform	Control Mean (N=15,566)
Outcome	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Took transfer-level English course	0.559*** (0.044)	0.980 (0.140)	0.119*** (0.025)	0.476 (0.499)	0.561*** (0.040)	0.624 (0.484)		
Passed transfer-level English course	0.128*** (0.027)	0.695 (0.461)	0.058* (0.017)	0.330 (0.470)	0.192*** (0.036)	0.738 (0.440)	0.130*** (0.031)	0.766 (0.424)
Number of below-transfer-level English credits attempted	-1.988*** (0.186)	0.234 (0.752)	-1.057*** (0.103)	0.029 (0.28)	-3.046*** (0.250)	0.264 (0.852)	-3.541*** (0.249)	0.928 (2.14)
Number of transfer-level English credits attempted	1.993*** (0.173)	3.594 (0.822)	0.469*** (0.089)	1.702 (1.894)	2.465*** (0.186)	5.296 (2.065)	2.259*** (0.183)	9.386 (7.522)
Number of transfer-level English credits earned	0.735*** (0.111)	2.791 (1.663)	0.247** (0.065)	1.203 (1.723)	1.032*** (0.165)	3.994 (2.637)	0.855*** (0.153)	6.426 (6.213)
College GPA	-0.080 (0.086)	2.38 (1.321)			0.107 (0.100)	2.318 (1.358)	-0.065 (0.127)	2.525 (1.397)
Earned any community college credential					-0.001 (0.002)	0.006 (0.077)	0.019 (0.012)	0.313 (0.464)
Earned a certificate					-0.001 (0.002)	0.004 (0.064)	0.003 (0.011)	0.192 (0.394)
Earned an associate degree					-0.001 (0.001)	0.003 (0.050)	0.025 (0.011)	0.286 (0.452)
Transfer to a 4-year university					0.005* (0.002)	0.009 (0.096)	0.064*** (0.014)	0.261 (0.439)

Note. The table presents results from two-way fixed effects regression models. Columns (1), (3), (5) and (7) provide the average treatment effects on the treated (*ATT*s), and Columns (2), (4), (6) and (8) show post-policy means for the control group. All models controlled for first-term measures, such as first-semester full-time status and GPA, and the amount of grants or scholarships received in the first year (for short-term outcomes) or through year four (for long-term outcomes). We also incorporated predictors of transfer-level course enrollment (i.e., race, parents' highest education level, highest-level HS English course, grade in highest-level HS English course, ELA CAASPP test z-score) and college fixed effects. The standard errors are clustered by college.

*** $p < 0.0001$, ** $p < 0.001$, * $p < 0.01$

Fall and spring semester. Following the implementation of AB 705, high-policy-exposure students in both the math and English subsamples—that is, students who would have been the least likely to take transfer-level math and English courses in the pre-AB 705 period, respectively—experienced a significant gain in their likelihood of enrolling in a transfer-level course in the first semester compared to low-policy-exposure students who would have been the most likely to enroll in transfer-level courses before AB 705. Specifically, students who were the least likely to enroll in a transfer-level math course in Fall 2017 were 28.4 percentage points more likely to do so in Fall 2019, and the corresponding group of students in the English sample were 55.9 percentage points more likely to enroll in a transfer-level English course in Fall 2019.

This suggests that the subsequent differences in outcomes in both subsamples were driven, at least in part, by the larger initial rise in transfer-level course enrollment among students at the bottom of the propensity score distribution, which bolsters support for our approach.

While the high-policy-exposure students' increased enrollment in transfer-level math course during the first fall semester resulted in a greater number of transfer-level math credits attempted in the first semester

compared with the similar group of pre-AB 705 entrants, their passing rate actually fell by 6.2 percentage points, so the extra enrollment did not translate into additional transfer-level math credits earned in that term (see Table 7). Still, shifting their course-taking patterns over the entire first year, they attempted 1.9 fewer below-transfer-level math credits and 1.6 more transfer-level math credits than comparable pre-AB 705 students. On the other hand, in the English sample, the pre- and post-policy differences in course-taking outcomes between the high- and the low- AB 705 exposure students were smaller in the spring semester than in the fall (as shown in Table 8).

Within the first year. The low-propensity, high-policy exposure students in the English sample experienced a 19-percentage-point boost in their probability of passing transfer-level English and earned one additional transfer-level course credit in their first year of college following AB 705 implementation. We also observed a 0.5-percentage-point larger probability that high-policy exposure students in the English sample transferred to a four-year institution within one year following AB 705.

Within four years. In the long term, we find a significant association between increased access to transfer-level courses and improvements in course-taking outcomes for the low-propensity, high-AB 705 exposure students in both math and English subsamples. After the policy's implementation, these students were more likely to pass, attempt, and earn more transfer-level credits within four years of college entrance, compared to similar students prior to the policy. Moreover, high-policy exposure students in the math and English subsamples experienced a 7.5 percentage point and 6.4 percentage point larger probability of transferring to a four-year institution within four years, respectively, compared with students with similar academic readiness who entered college pre-policy. While those in the math sample also had a 3.7 percentage point higher probability of earning an associate degree, the difference in AB 705 exposure did not result in differences in community college degree attainment within four years of college entry among the high-policy exposure students in the English sample.

RQ4: What is the overall impact of the AB 705 policy on student outcomes (e.g., transfer-level math passing rate in the first year)?

To address the question of the overall impact of AB 705 on student outcomes more broadly, we employ a single interrupted time series (ITS) design, which is particularly well-suited for evaluating large-scale, population-level "natural experiments" such as AB 705, where a traditional comparison group is unavailable (Baicker & Svoronos, 2019; Kontopantelis et al., 2015; Bloom, 2003). In this analysis, we also address the sub research questions: Does the effect of AB 705 vary across students with high, middle, and low high school achievement? Does the overall policy effect vary across different socio-demographic student groups?

The weighted interrupted time series (ITS) analysis provides strong evidence that California's AB 705 developmental education reform led to substantial increases in enrollment in and completion of transfer-level math and English courses during students' first year, particularly in math and among students with low or middle prior academic achievement. Enrollment gains were evident as early as fall 2018 and peaked in 2019, though English outcomes declined sharply in 2020 due to COVID-19 disruptions. The policy had its strongest and most consistent impact on students in the low and middle achievement groups, with limited or even negative effects observed among high achievers, especially during the pandemic. Analyses by race/ethnicity indicate that Black and Hispanic students experienced significantly larger gains in both enrollment and completion than White students, suggesting that AB 705 helped narrow racial equity gaps. However, women showed greater improvements than men across most outcomes, particularly in math, implying that the policy may have slightly widened gender disparities in women's favor. Overall, AB 705 successfully expanded access to gateway courses and improved course completion rates, especially for students historically underserved by developmental education placements.

Analytic Strategy: Interrupted Time Series Analysis

Although AB 705 was officially implemented in fall 2019, many colleges began reducing below transfer-level course offerings and expanding transfer-level courses as early as fall 2018. According to the RP Group (2019), over 90% of colleges reduced English DE courses and 84% reduced math DE courses during this period. To reflect this early implementation, we categorize fall 2018 as a roll-out cohort, rather than grouping it with the pre-policy period.

The following linear probability model is used to estimate the impact of the policy on first-year student outcomes:

$$Y_{ijt} = \beta_0 + \beta_1 Time_t + \beta_2 P_{18-19} + \beta_3 P_{19-20} + \beta_4 P_{20-21} + \beta_5 X_{ijt} + C_j + \varepsilon_{ijt}$$

where:

Variable	Description
Y_{ijt}	first year outcome for a FTIC student i, enrolled in college j, in the fall of academic year t
$Time_t$	a continuous variable which indicates the time (i.e., academic year)
P_{18-19}	1 for student i in the fall 2018 (AB705 roll-out year) cohort, 0 otherwise
P_{19-20}	1 for student i in the fall 2019 (AB705 full implementation year 1) cohort, 0 otherwise
P_{20-21}	1 for student i in the fall 2020 (AB705 full implementation year 2) cohort, 0 otherwise
X_{ijt}	a vector of student demographic background and baseline (high school)

	math/English achievement variables for a first-time college student i, enrolled in college j, in the fall of academic year t
C_j	college fixed effects
ε_{ijt}	random errors

In this model, β_0 and β_1 represents the intercept and slope of pre-policy trend line (i.e., baseline trend), and β_2, β_3, and β_4 capture deviations from the baseline trend, estimates of the overall policy impact on the outcomes of the AB705 roll-out cohort and two follow-up cohorts, respectively. β_5 captures the effects of a vector of student background variables, including high school academic achievement.

To address cohort compositional changes, we applied inverse probability weights (IPWs). These weights were estimated using multinomial logistic regression models based on 11th-grade state assessment scores, demographic variables, and SES indicators, with the fall 2017 cohort serving as the reference group. The weights ensure that the pre- and post-policy cohorts are balanced in terms of observed baseline characteristics. All results reported in the following section are based on weighted ITS regression models using these IPWs.

We conducted a single interrupted time series (ITS) analysis to evaluate the effects of California's developmental education (DE) reform, implemented via AB 705, on transfer-level math and English course enrollment and completion rates within the first academic year, which is defined as the primary policy goal of AB 705. Our analysis also examined differential effects of the reform on students with low, middle, and high baseline academic achievement defined by high school math and ELA state assessment scores as well as across race/ethnic and gender subgroups.

ITS Sample and Data

A common concern in single ITS designs is selection bias, which occurs when cohort-level compositional changes influence outcome trends and thereby confound policy effect estimates (Bloom, 2003; Park-Gaghan et al., 2020; Cullinan & Biedzio, 2021). To address this potential threat to validity, we obtained and merged 11th-grade state math and ELA assessment data for all California public high school graduates from 2011 through 2023 with the full sample of FTIC students reported in Table 4.

We used students' state assessment scores, demographic characteristics, and socioeconomic status (SES) to assess and establish baseline equivalence across pre- and post-AB 705 cohorts. As a result, the ITS analytic sample was restricted to FTIC students who (1) graduated from California public high schools and (2) had valid 11th-grade state assessment scores. Furthermore, we excluded the 2015, 2021, and 2022 cohorts, as state tests were not administered in 2014 due to statewide transitions in math and ELA assessments (from STAR to CAASPP) and in 2020 and 2021 due to the COVID-19 pandemic. Consequently, over 90% of FTIC students who graduated from CA public high schools in these cohorts lacked state assessment scores. Table 9 shows the number of FTIC students included in the ITS analysis sample by subject and cohort.

Table 9. Number of FTIC students included in the ITS analytic samples for math and English, by cohort

Subject	College entry year of FTIC students in fall cohort								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Math	54,289	Dropped	47,591	49,632	58,005	64,761	56,684	Dropped	Dropped
English	60,225	Dropped	48,516	50,308	58,515	65,329	57,023	Dropped	Dropped

ITS Results

Table 10 presents the weighted interrupted time series (ITS) regression results estimating the effects of California's developmental education reform under AB 705 on first-year enrollment in and completion of transfer-level math and English courses. The analysis includes three post-policy cohorts: 2018 (roll-out year), 2019 (first year of full implementation), and 2020 (second year of full implementation). The reported coefficients for these cohorts represent deviations from the baseline trend observed in the pre-policy period.

Table 10. Impact of AB 705 development education reform on the enrollment and completion of transfer-level math and English courses during the first academic year (weighted Interrupted Time Series analysis results)

	Transfer-level course enrollment		Transfer-level course completion	
	Math	English	Math	English
Time	0.0134***	0.0587***	0.0054***	0.0418***
	(0.0012)	(0.0014)	(0.0010)	(0.0013)
Fall 2018 cohort	0.0489***	0.0353***	0.0255***	0.0138***
	(0.0031)	(0.0035)	(0.0026)	(0.0034)
Fall 2019 cohort	0.1932***	0.0587***	0.0826***	-0.0066
	(0.0042)	(0.0047)	(0.0036)	(0.0045)
Fall 2020 cohort (COVID cohort)	0.1281***	-0.0721***	0.0611***	-0.1077***
	(0.0053)	(0.0060)	(0.0045)	(0.0058)
R-squared	0.227	0.243	0.181	0.188
N cohorts	6	6	6	6
N colleges	104	104	104	104
N students	330,962	339,942	330,962	339,942

Note: All models include variables for high school state assessment scores, student demographic/SES characteristics, and college fixed effects. Standard errors are shown in parentheses. *** p<0.001, ** p<0.01, * p<0.05.

Following the policy implementation, enrollment and completion rates were higher than the pre-policy trend line, except during the COVID-19 period. Gains in enrollment consistently outpaced gains in completion and effects were more pronounced in math than English. For transfer-level course enrollment, the results show that both math and English enrollment rates began rising in the 2018 cohort, with statistically significant gains of 4.9 percentage points for math and 3.5 percentage points for English above the expected baseline trend. The increases peaked in the 2019 cohort, with math enrollment jumping by 19.3 percentage points and English by 5.9 percentage points. However, by the 2020 cohort, enrollment trends diverged. While math enrollment remained well above the baseline trend (by 12.8 percentage points), English enrollment dropped sharply, falling 7.2 percentage points below the baseline trend. This decline may reflect both the high pre-policy upward trajectory in English enrollment (an average annual increase of 5.9 percentage points), which may have led to a ceiling effect, and the significant disruptions caused by the COVID-19 pandemic, which impacted instructional delivery and student engagement statewide.

For transfer-level course completion, math outcomes improved consistently across all three post-policy cohorts. Completion rates rose by 2.6 percentage points in 2018, 8.3 percentage points in 2019, and 6.1 percentage points in 2020, each relative to the baseline trend and statistically significant at the 0.001 level. In contrast, English completion patterns were more variable. The 2018 cohort saw a modest but statistically significant increase of 1.4 percentage points. The 2019 cohort showed no significant deviation from the baseline trend. However, in 2020, English completion declined sharply by 10.8 percentage points below the trend. This pattern likely reflects a combination of pandemic-related learning disruptions, the decline in transfer-level English course enrollment, and the strong pre-policy upward trend in English completion (an average increase of 4.2 percentage points per year), which may have created a ceiling effect.

Differential impacts based on prior academic preparation

Since the implementation of AB 705, faculty and others have raised concerns about students entering transfer-level coursework underprepared, based on their prior academic preparation. To examine whether the effects of AB 705 varied based on students' prior academic preparation, we grouped FTIC students into three achievement levels—high**,** middle, and low—based on their 11th-grade California state math or ELA assessment scores. Students in the high achievement group scored at or above the 75th percentile, those in the middle achievement group scored between the 25th and 75th percentiles, and those in the low achievement group scored at or below the 25th percentile. Table 11 presents the weighted ITS regression results for each achievement group.

Table 11. Impact of the AB 705 Development Education reform on the enrollment and completion of transfer-level math and English courses during the first academic year, by high school math and English achievement level (weighted Interrupted Time Series analysis)

	Transfer-level course enrollment		**Transfer-level course completion**	
	Math	English	Math	English
High Achievement Group (State math/ELA assessment score >= 75th percentile)				
Time	0.426***	0.0339***	0.0389***	0.0361***
	(0.0035)	(0.0029)	(0.0035)	(0.0032)
Fall 2018 cohort	-0.0196*	-0.0043	-0.0212*	-0.0130
	(0.0087)	(0.0073)	(0.0088)	(0.0080)
Fall 2019 cohort	-0.0106	-0.0384***	-0.0196	-0.0651***
	(0.0117)	(0.0098)	(0.0119)	(0.0107)
Fall 2020 cohort	-0.1170***	-0.1528***	-0.1167***	-0.1766***
	(0.0150)	(0.0126)	(0.0150)	(0.0058)
Middle Achievement Group (25th percentile < State math/ELA assessment score < 75th percentile)				
Time	0.0028	0.0617***	-0.0055***	0.0431***
	(0.0017)	(0.0018)	(0.0014)	(0.0018)
Fall 2018 cohort (roll-out year)	0.0802***	0.0371***	0.0488***	0.0201***
	(0.0042)	(0.0047)	(0.0034)	(0.0047)
Fall 2019 cohort	0.2544***	0.0554***	0.1284***	0.0018
	(0.0057)	(0.0062)	(0.0047)	(0.0062)
Fall 2020 cohort	0.1972***	-0.0817***	0.1263***	-0.1055***
	(0.0073)	(0.0080)	(0.0059)	(0.0079)
Low Achievement Group (State math/ELA assessment score <= 25th percentile)				
Time	0.0020	0.0718***	-0.0041***	0.0423***
	(0.0014)	(0.0026)	(0.0001)	(0.0021)

Fall 2018 cohort	0.0436***	0.0574***	0.0162***	0.0142*
	(0.0038)	(0.0069)	(0.0024)	(0.0058)
Fall 2019 cohort	0.2312***	0.1525***	0.0730***	0.0252*
	(0.0054)	(0.0090)	(0.0035)	(0.0075)
Fall 2020 cohort	0.1959***	0.0240*	0.0773***	-0.0482***
	(0.0069)	(0.0116)	(0.0035)	(0.0095)

Note: All models include variables for high school state assessment scores, student demographic/SES characteristics, and college fixed effects. Standard errors are shown in parentheses.

*** p<0.001, ** p<0.01, * p<0.05

AB 705 had the most positive and consistent effects on students with middle and low levels of prior academic achievement. In contrast, students in the high achievement group, who likely already had access to transfer-level coursework before the policy, did not benefit from the reform. While all groups experienced setbacks in 2020 coinciding with the onset of the COVID-19 pandemic, the decline in transfer-level course outcomes was most pronounced among high achievers. For students in the middle and low achievement groups, declines in 2020 were more modest, as the substantial gains in enrollment and completion following AB 705 helped offset the negative effects of the pandemic.

Among students in the **high achievement group**, AB 705 did not appear to generate positive effects on transfer-level math or English course enrollment or completion. Enrollment rates for both subjects remained relatively flat in the 2018 and 2019 cohorts compared to the baseline trend. However, in the 2020 cohort, transfer-level enrollment rates declined sharply by 11.7 percentage points for math and 15.3 percentage points for English. For course completion, there were no significant changes in math in either the 2018 or 2019 cohorts. In English, completion rates held steady in 2018 but dropped significantly—by 6.5 percentage points—below the baseline trend in 2019. In 2020, completion rates for both math and English declined substantially, falling by 11.7 and 17.7 percentage points, respectively, consistent with the enrollment declines and pandemic-related disruptions.

In contrast, we observed stronger positive effects among students in the **middle achievement group**. For math, transfer-level enrollment rates increased substantially across all three post-policy cohorts—by 8.0 percentage points in 2018, 25.4 points in 2019, and 19.7 points in 2020. English enrollment also rose significantly in 2018 (3.7 points) and 2019 (5.5 points) but declined by 8.2 points in the 2020 cohort relative to the baseline trends, again reflecting COVID-19-related impacts. Across all years, estimated policy effects were consistently larger for math than for English. For course completion, math rates increased significantly in all three cohorts compared to the baseline trends by 4.9, 12.8, and 12.6 percentage points, respectively. For English, completion increased by 2.0 percentage points in 2018 but showed no improvement in 2019 and declined by 10.6 points in 2020. Notably, across cohorts and subjects, the increases in completion were generally about half the size of the increases in enrollment, suggesting that expanded access did not always translate to equivalent gains in course success.

Students in the **low achievement group** also saw substantial improvements in math outcomes following AB 705 implementation. Transfer-level math enrollment increased by 4.4 points in 2018, 23.1 points in 2019, and 19.6 points in 2020, relative to baseline trends. English enrollment rates rose by 5.7 points in 2018 and 15.3 points in 2019, though the upward trend leveled off in 2020, with only a modest 2.4-point increase. In terms of completion, math rates improved significantly in all three cohorts, increasing by 1.6, 7.3, and 7.7 points, respectively. English completion showed small but statistically significant gains in 2018 (1.4 points) and 2019 (2.5 points) but then dropped below the baseline trend by 4.8 points in the 2020 cohort, again likely influenced by pandemic-era challenges.

Differential impacts based on student race/ethnicity

A key motivation behind AB 705 was improving equitable placement and outcomes among racially minoritized student populations, who had previously been overrepresented in developmental education. To assess whether the effects of AB 705 varied across racial and ethnic subgroups, we estimated weighted ITS models with interaction terms between post-policy cohort indicators and race/ethnicity, using White students as the reference group (see Table 12). The estimates in the table report the differential effects of AB 705 on transfer-level course enrollment and completion rates for Black, Hispanic, Asian, and other students relative to White students.

Table 12. Impact of AB 705 Development Education reform on the enrollment and completion of transfer-level math and English courses during the first academic year, by race/ethnicity group (weighted Interrupted Time Series analysis)

	Transfer-level course enrollment		**Transfer-level course completion**	
	Math	English	Math	English
Black vs. White				
Fall 2018 cohort	0.0181*	0.0802***	0.0084	0.0259*
	(0.0092)	(0.0113)	(0.0073)	(0.0106)
Fall 2019 cohort	0.0583***	0.1333***	-0.0241**	0.0307**
	(0.0101)	(0.0105)	(0.0078)	(0.0103)
Fall 2020 cohort	0.0933***	0.1668***	-0.0005	0.0447***
	(0.0105)	(0.0116)	(0.0079)	(0.0105)
Hispanic vs. White				
Fall 2018 cohort	0.0146**	0.0698***	-0.0001	0.0278***
	(0.0050)	(0.0053)	(0.0044)	(0.0054)
Fall 2019 cohort	0.0533***	0.1099***	-0.0127**	0.0237***
	(0.0053)	(0.0052)	(0.0048)	(0.0055)
Fall 2020 cohort	0.0863***	0.1358***	0.0169***	0.0488***
	(0.0053)	(0.0055)	(0.0047)	(0.0055)
Asian vs. White				
Fall 2018 cohort	0.0084	0.0517***	0.0243**	0.0373***
	(0.0080)	(0.0079)	(0.0076)	(0.0083)
Fall 2019 cohort	-0.0278*	0.0142	-0.0094	0.0070
	(0.0082)	(0.0078)	(0.0079)	(0.0085)
Fall 2020 cohort	0.0030	0.0185*	0.0347***	0.0039
	(0.0050)	(0.0083)	(0.0078)	(0.0085)
Other vs. White				
Fall 2018 cohort	0.0033	0.0160	0.0007	-0.0102
	(0.0084)	(0.0091)	(0.0074)	(0.0092)
Fall 2019 cohort	-0.0093	0.0155	-0.0300***	-0.0179*
	(0.0081)	(0.0081)	(0.0072)	(0.0084)
Fall 2020 cohort	0.0439***	0.0733***	0.0114	0.0211*
	(0.0088)	(0.0090)	(0.0078)	(0.0090)

Note: All models include variables for high school state assessment scores, student demographic/SES characteristics, and college fixed effects. Standard errors are shown in parentheses.

*** p<0.001, ** p<0.01, * p<0.05

Results indicate that Black and Hispanic students experienced significantly greater gains in transfer-level course enrollment in both math and English, compared to White students, across all three post-policy cohorts. For instance, in the 2020 cohort, math enrollment rates were 9.3 percentage points higher for Black students and 8.6 percentage points higher for Hispanic students than for White students. English enrollment rates showed similarly strong advantages, with increases of 16.7 and 13.6 percentage points for Black and Hispanic students, respectively, over their White peers. Asian students saw modest gains in English enrollment in 2018 and 2020, but less consistent improvement in math. Students in the "Other" race/ethnicity category had smaller and more variable effects, with significant enrollment gains over White students appearing only in the 2020 cohort.

Importantly, AB 705 also helped narrow racial/ethnic gaps in transfer-level course completion, especially in math. Black and Hispanic students both showed significantly greater improvements in math completion rates relative to White students—particularly in the 2020 cohort, where the math completion rate was 1.7 percentage points higher for Hispanic students and on par for Black students despite the pandemic. While gains in English completion were smaller in magnitude, both groups still outpaced White students in all three cohorts. For example, Hispanic students had English completion rates that were 2.8, 2.4, and 4.9 percentage points higher than White students in 2018, 2019, and 2020, respectively. These findings suggest that AB 705 has contributed to reducing longstanding racial/ethnic disparities in access to and success in transfer-level courses. The consistent and significant improvements for Black and Hispanic students across both math and English—particularly in course completion—underscore the equity implications of the reform, helping to narrow outcome gaps that have historically disadvantaged these student populations.

Differential impacts based on student gender identity

Lastly, to assess whether the effects of AB 705 varied across gender, we estimated weighted ITS models with interaction terms between post-policy cohort indicators and gender, using male students as the reference group (see Table 13). As in the previous section, the estimates in Table 13 represent the differential effects of AB 705 for female students relative to their male peers.

Table 13. Impact of AB 705 Development Education reform on the enrollment and completion of transfer-level math and English courses during the first academic year, by gender group (weighted Interrupted Time Series analysis)

	Transfer-level course enrollment		**Transfer-level course completion**	
	Math	English	Math	English
Female vs. Male				
Fall 2018 cohort	0.0286***	0.0229***	0.0122***	0.0195***
	(0.0038)	(0.0042)	(0.0022)	(0.0042)
Fall 2019 cohort	0.0411***	0.0092*	0.0266***	0.0237***
	(0.0040)	(0.0040)	(0.0022)	(0.0042)
Fall 2020 cohort	0.0318***	-0.0019	0.0166***	0.0017
	(0.0042)	(0.0043)	(0.0024)	(0.0043)

Note: All models include variables for high school state assessment scores, student demographic/SES characteristics, and college fixed effects. Standard errors are shown in parentheses.

*** p<0.001, ** p<0.01, * p<0.05

The weighted ITS analysis by gender reveals that women experienced significantly greater improvements than men in transfer-level course enrollment and completion following AB 705, particularly in math. As shown in Table 13, women outpaced men in math enrollment across all three post-policy cohorts, with statistically significant differences ranging from 2.9 to 4.1 percentage points. In English,

women also saw higher enrollment gains in 2018 and 2019, though a significant difference was not observed in 2020. For course completion, the advantage for women was consistent and notable in math, with improvements over men ranging from 1.2 to 2.7 percentage points across all three cohorts. In English, women again showed greater gains than men in 2018 and 2019, but the difference was no longer statistically significant in 2020. These findings suggest that AB 705 may have slightly amplified existing gender disparities in favor of women, particularly in math, where they benefited more consistently than their male peers from the expanded access to transfer-level coursework.

Summary of the Impact Study

This impact study presents a comprehensive assessment of AB 705's effects on access to and success in transfer-level coursework and various longer term post-secondary outcomes, leveraging multiple causal inference methods and statewide administrative data. Three research questions guided the analysis: (1) the impact of transfer-level placement on short- and long-term outcomes (RQ3), (2) the overall impact of AB 705 on first-year transfer-level course enrollment and completion rates (RQ4), and (3) whether the impacts on the first year enrollment and completion rates varied by students' prior (high school) academic achievement and socio-demographic characteristics (RQ4a).

Across both analytic strategies used to address RQ3, Inverse Probability Weighted Regression Adjustment (IPWRA) and a difference-in-differences-inspired approach, results consistently show that early access to transfer-level math and English courses was related to improved short-term and long-term educational outcomes. These results suggest that early placement into transfer-level coursework accelerates academic momentum and contributes to higher rates of program completion. Students placed directly into transfer-level courses in their first semester attempted and earned more college-level credits, accumulated higher GPAs, and had higher rates of associate degree completion and transfer to four-year institutions over four years.

The weighted interrupted time series (ITS) analysis (RQ4) similarly showed that AB 705 significantly improved transfer-level course enrollment and completion rates during the first year of college, particularly in math. Gains were evident in the roll-out year (2018) and peaked in 2019. Although English outcomes declined and fell below the baseline trend level in 2020—likely due to pandemic-related disruptions and a ceiling effect—the overall trend confirmed the reform's success in increasing access to and completion in transfer-level coursework within the first academic year in college. The increases in enrollment, however, generally outpaced gains in course completion, suggesting that expanded access to transfer-level courses alone did not always translate into equivalent improvements in completion rates.

Subgroup ITS analyses (RQ4a) revealed clear patterns of differential impact. AB 705 had the most positive and consistent effects for students with low and middle levels of high school academic achievement, while students in the high-achieving group, who likely had high access to transfer-level courses prior to AB 705, experienced null or even negative effects. Notably, Black and Hispanic students saw significantly greater improvements in transfer-level course enrollment and completion rates than their White peers, pointing to the placement reform's role in reducing racial and ethnic disparities in access and outcomes. Women also experienced more favorable impacts than men, particularly in math, over time.

Taken together, the findings across different multiple analytic methods strongly support the conclusion that AB 705 expanded equitable access to and success in transfer-level coursework and improved long-term community college outcomes. The most substantial benefits were observed among students who were likely to begin their math and English coursework in developmental education, particularly those with lower academic readiness and racially minoritized students. These findings highlight the reform's effectiveness in promoting both access and equity in California's community colleges.

Cost Effectiveness Study

The cost-effectiveness study seeks to understand AB705 from the perspective of impacts on student outcomes in relation to the costs required to implement the reform, guided by the following research questions:

Cost Effectiveness Study	Research Question	Details
	RQ5	Are introductory transfer-level courses with or without cocurricular support more cost-effective than DE courses as a whole (corresponding to RQ4)?
	RQ6	Which cocurricular support model is the most cost-effective (corresponding to RQ5)?

To address RQ5, we draw on estimates from the IPWRA study above that identify the effectiveness of placement into transfer-level courses with or without cocurricular supports relative to placement into developmental education. Cost estimates are derived from implementation data collected in AY 2022-23 and adjusted to reflect the timing of IPWRA estimates using discount rates. To address RQ6, we focus on the three most prominent cocurricular support models implemented in response to AB705. These models include embedded tutoring, corequisite-paired courses, and enhanced courses. We conduct new analyses using AY 2022-23 to estimate differences in course completion rates between students who enroll in transfer-level courses with cocurricular supports and observably similar students who enroll in transfer-level courses without those supports within a propensity score matching framework. We estimate effectiveness estimates separately for each type of cocurricular support to generate separate cost-effectiveness estimates for each of the three cocurricular support models.

Data and Methods

The cost effectiveness study draws on cost data collected from the 13 original institutions sampled for in-depth fieldwork in 2022. To collect data on AB705 implementation costs, we applied the Ingredient Cost Method (Levin et al., 2018) to identify costs borne by institutions and students, identifying two primary categories of costs: (1) implementation support for faculty, and (2) course and student support. Within these two cost categories, we drew on multiple sources of data to identify ingredients related to institutions' implementation responses to AB 705:

1. *Faculty Survey:* The spring 2024 administration of the faculty survey included questions related to the number of hours English and math faculty spent on instructional practices and other activities in response to AB 705 in AY 2022-23. For example, we asked faculty members to estimate the time they spent on attending professional development sessions, revising curricula, and providing different types of cocurricular supports. A total of 104 faculty members completed the cost study questions within the faculty survey. Fifty-five percent of respondents were English faculty, and the remaining 45 percent were math faculty. Among faculty who responded to the cost study questions, 64 percent taught a transfer-level with cocurricular support, and among those, 44 percent taught a course with embedded tutors, 41 percent taught a corequisite-paired course, and less than ten percent taught an enhanced course (Table 14). By contrast, 36 percent of faculty who completed the cost study questions taught a transfer-level course without any cocurricular support.

Table 14. Faculty engagement in cocurricular supports

Faculty Response	Percentage
Taught a transfer-level course without any cocurricular support	36%
Taught a transfer-level with cocurricular support	64%
Taught a course with embedded tutors	44%
Taught a corequisite-paired course	41%
Taught an enhanced course	Less than 10%
Taught a transfer-level course without any cocurricular support	36%

2. *College Administrator Questionnaire:* In spring 2024, we administered a College Administrator Questionnaire to each sample institution. We received responses from 11 out of the 13 institutions. Through this questionnaire, we gathered data specifically on what implementation activities and cocurricular supports the institutions implemented in response to AB 705 in AY 2022-23. We also asked questions specific to each type of cocurricular support model to identify cost ingredients that are distinct to each cocurricular model.

3. *Systemwide Departmental Survey:* We used data from a 2024 systemwide departmental survey that includes section-level data on cocurricular support models. The survey asks institutions to identify, for each English and math course section, whether and which cocurricular supports are offered. We linked these data to systemwide administrative data from the Chancellor's Office Management Information Systems (COMIS; see below) to identify individual students in course sections with different types of cocurricular support models to compile student-level cost estimates by type of cocurricular model.

4. *Chancellor's Office Management Information Systems (COMIS)*: This systemwide student-level dataset provides us with information on the costs incurred by students to complete transfer-level courses with and without cocurricular supports. It also includes information about faculty teaching load used to estimate faculty instructional costs across cocurricular models.

5. *Publicly available market prices:* After identifying ingredients, we priced each ingredient using cost data collected from the faculty survey and college administrator questionnaire, web searches, and the CostOut tool, which is a dataset of publicly available market prices from the U.S. Bureau of Labor Statistics and other sources. For example, we gathered information on tutor salary through the college administrator questionnaire, whereas data on faculty salary (to generate costs of instructional time) came from web searches and CostOut and reflects regional specific math and English community college faculty salaries. Each ingredient was priced to reflect local costs. We calculated per-pupil costs for each ingredient individually using the total number of students served by the given ingredient. For example, ingredients that apply to all implementation conditions such as faculty release time on implementation activities are associated with a greater number of students served than ingredients that apply to a single implementation condition, such as embedded tutors, which only applies to students in sections offering embedded tutors.

From these data, we identified ingredients and their costs, itemizing ingredients across implementation conditions. These implementation conditions include transfer-level courses with or without cocurricular supports; transfer-level courses with any cocurricular support; transfer-level courses with embedded tutors; transfer-level courses with enhanced support; corequisite-paired transfer-level courses. Table 15 below offers an overview of the cost categories with example ingredients across each implementation condition.

Table 15. Cost categories and example ingredients

Cost Perspective	Cost Category	Example Ingredients				
		With or without cocurriculars	Without cocurriculars	Embedded Tutors	Enhanced	Corequisites
Institution	Faculty time on implementation	Faculty time as a designated point person for AB705 Faculty "release time" to focus on implementation activities	Faculty time as a designated point person for AB705 Faculty "release time" to focus on implementation activities	Faculty time as a designated point person for AB705 Faculty "release time" to focus on implementation activities **Faculty time training embedded tutors**	Faculty time as a designated point person for AB705 Faculty "release time" to focus on implementation activities **Faculty time preparing lessons**	Faculty time as a designated point person for AB705 Faculty "release time" to focus on implementation activities **Faculty time coordinating with support lab instructor**
	Faculty professional development	Community of practice External conferences	Community of practice External conferences	Community of practice External conferences	Community of practice External conferences	Community of practice External conferences
	Course and student support	Expansion of academic supports for students	Expansion of academic supports for students	Expansion of academic supports for students	Expansion of academic supports for students	Expansion of academic supports for students
	Institutional Savings	Closed testing center	Closed testing center	Closed testing center	Closed testing center	Closed testing center
Student	Course and student support	Textbooks, course supplies, tuition and fees	Textbooks, course supplies, tuition and fees	Textbooks, course supplies, tuition and fees	Textbooks, course supplies, tuition and fees	Textbooks, course supplies, tuition and fees

Across implementation models, implementation conditions largely draw on the same ingredients. These ingredients largely represent activities required to implement AB 705 as a whole, such as faculty release time spent on implementation activities, or expansion of academic supports for students, including additional tutoring or summer bridge programs.

Within the "faculty time on implementation" cost category, there are some ingredients that vary across cocurricular models. For example, costs required to implement the embedded tutor model include faculty time to train embedded tutors, whereas costs required to implement corequisite-paired courses include faculty time coordinating with the support lab instructor.

Cost Study Results

RQ5: What is the cost-effectiveness of transfer-level placement programs, with and without co-curricular student supports, relative to business-as-usual developmental education programs?

To address this question, we drew on effectiveness estimates from the IPWRA impact study (see Tables 5 and 6), which assess the impact of placement into transfer-level courses, both with and without cocurricular supports. To estimate the cost of implementing transfer-level placement programs at California community colleges, this study uses cost data collected in AY 2022–23. These figures are adjusted to 2019 dollars using a 3% annual discount rate and regional price parities, following U.S. Bureau of Economic Analysis guidelines (2025).

For the comparison group, effectiveness estimates for developmental education programs are obtained from a literature review, prioritizing studies that employ quasi-experimental designs (QED) and report outcome measures that can be used to compute standardized effect sizes (Cohen, 1988). Our study leverages effectiveness measures for the following outcomes: passing a transfer-level math or English course within one year and within four years and earning any community college credential within four years. The cost of business-as-usual developmental education programs was obtained through a literature review and similarly adjusted to 2019 dollars using the same discount rate and California-specific regional price parities.

Table 16 presents cost estimates based on AY 2022–23 data, adjusted to 2019 dollars using a 3% annual discount rate and California-specific regional price parities. The table shows that **transfer-level placement programs are substantially less costly than prerequisite-type developmental education, highlighting the potential of transfer-level placement program to significantly reduce institutional expenditure while ensuring its accessibility.** The total cost per student is approximately $180 for math and $166 for English under the transfer-level placement model, compared to $1,512 for math and $1,446 for English in the business-as-usual developmental education model.

Table 16. Estimated costs of transfer-level placement vs. developmental education programs in math and English in California (Adjusted to 2019 Dollars)

Cost Category	**Math**		**English**	
	Transfer-Level	Dev-Ed	Transfer-Level	Dev-Ed
Faculty time on implementation	$1,355,076.51	N/A	$1,342,196.96	N/A
Course and student support	$288,225.00		$288,225.00	
Faculty professional development	$154,657.63		$161,833.85	
Institutional savings	($9,150.00)		($9,150.00)	
Total cost to institutions	$1,788,809.14		$1,783,105.81	
Per-student cost to institutions	$16.48		$16.42	
Per-student cost to students	$163.61		$149.94	
Total cost per student	$180.09	$1511.58	$166.36	$1446.31
Total students served	108,575	140,130	134,408	206,075

Notes: Due to differences in how cost categories were aggregated across studies from the literature review, only the total instructional cost per student is reported for the Dev-Ed group. The overall total cost per student for this group is a weighted

average, adjusted for variation in enrollment sizes across study samples. Cost data from empirical studies were adjusted using regional price parities (RPP) to reflect California's cost of living. The adjusted California-equivalent cost was calculated by multiplying the original cost by the ratio of California's RPP to that of the comparison state. All amounts are expressed in 2019 dollars using the Consumer Price Index (CPI). For example, the adjusted dollar value in 2019 is calculated by multiplying the value in 2022 by the ratio of the CPI in 2019 to the CPI in 2022.

Sources: U.S. Bureau of Labor Statistics. (n.d.); U.S. Bureau of Economic Analysis. (2025).

Limitations

A major limitation of this study is that cost and effectiveness estimates were not derived from a within-study comparison design. While the literature review focused on studies of prerequisite-type developmental education programs, these programs differ greatly in institutional context, implementation readiness, duration, level, and in how outcomes are measured and data are collected. Additionally, the transfer-level placement costs we collected exclude institutional overhead and administrative expenses. In contrast, published cost figures for prerequisite developmental education are typically aggregated, and the estimates reported may therefore be higher than what similar activities would actually cost.

Due to differences in program contexts and data reporting, it is difficult to determine whether the cost analysis approach used in this study systematically overestimates or underestimates the relevant costs of transfer-level programs compared to prerequisite-type programs. The exclusion of institutional overhead may lead to an underestimation of the true cost of implementing transfer-level placement, thereby overstating its cost advantage relative to prerequisite programs. On the other hand, if studies of prerequisite programs do not account for students' repeated course attempts and focus only on their initial enrollment in developmental education, they may underestimate the total cost of those programs, thereby understating the cost advantage of transfer-level placement. As a result, the findings should be interpreted with an understanding of these limitations, including the assumptions made and the potential for bias introduced by cross-study comparisons. Sensitivity analyses are planned to assess the robustness of our findings by incorporating adjustments for factors such as indirect costs and students' repeated course attempts. These analyses will help establish a plausible range of program costs and clarify how key contextual factors may influence our conclusions.

RQ6: Which cocurricular support model is the most cost-effective?

While AB 705 prompted institutions to increase student enrollment in transfer-level math and English courses, the reform did not mandate cocurricular support models within transfer-level courses. As a result, institutions' implementation responses have varied considerably. The purpose of this analysis is to understand the cost-effectiveness of these various responses by focusing on the three most prominent cocurricular support models implemented in the context of AB 705 (embedded tutors, enhanced courses, and corequisite-paired courses) to identify which cocurricular model is the most cost-effective.

Data sources

Effectiveness estimates come from new analyses drawn from a sample of 65 institutions that completed the systemwide departmental survey. Our analysis is restricted to these institutions because the systemwide departmental survey data provide information on the specific cocurricular supports offered with each introductory math and English transfer-level course section. We merge these data with student-level data from COMIS for information on course section enrollment and completion, which allows us to track student course completion outcomes across sections with different cocurricular support models. Our dataset also includes information on student background characteristics from COMIS and high school achievement data from the California Department of Education. All analyses draw on data from AY 2022-23 to align with our cost estimates.

Analytic methods

We use a propensity score matching approach to estimate differences in 1-year course completion rates between observably similar students in each cocurricular model relative to transfer-level courses without those supports. Our matching approaches balance each set of treatment students (those in transfer-level courses with embedded tutors, corequisites, and enhanced) to a unique set of comparison students (in transfer-level courses without those supports) on baseline high school achievement measures and demographic indicators. We thus create three distinct analytic samples, one for each treatment condition. We then used regression models with college fixed effects to estimate adjusted mean differences in 1-year course completion rates between students in each type of cocurricular model and those in transfer-level courses without those supports.

Overall, our results indicate that transfer-level courses with cocurricular supports are more costly to implement than standalone transfer-level courses but are not more effective than standalone transfer-level courses in terms of 1-year course completion rates. Results are shown in Tables 17-19 and described in more detail below.

To understand the costs of different cocurricular models in relation to the costs of standalone transfer-level courses, we leveraged cost data collected from AY 2022-23. Cost estimates for math courses are shown in Table 17 below, and for English in Table 18.

Table 17. Estimated costs of math transfer-level cocurricular support models vs. standalone transfer-level courses (2023 Dollars).

Cost Category	Embedded Tutor	Enhanced	Corequisite	Standalone Transfer
Faculty time on implementation	$679,043.15	$593,443.83	$873,235.11	419,294.77
Course and student support	$519,750.00	$315,000.00	$315,000.00	319,916.85
Faculty professional development	$169,024.74	$169,024.74	$169,024.74	768,476.77
Institutional savings	($10,000.00)	($10,000.00)	($10,000.00)	($10,000.00)
Total cost to institutions	$1,357,817.89	$1,067,468.57	$1,347,259.85	1,497688.39
Per-student cost to institutions	$252.09	$3,122.39	$192.32	$23.35
Per-student cost to students	$2,215.00	$2,283.50	$2,215.00	$2,215.00
Total cost per student	$2,467.09	$5,405.89	$2,407.32	$2,238.35
Total students served	2,306	88	2,994	71,378

Table 18. Estimated Costs of English Transfer-Level Cocurricular Support Models vs. Standalone Transfer-Level Courses (2023 Dollars).

Cost Category	Embedded Tutor	Enhanced	Corequisite	Standalone Transfer
Faculty time on implementation	469,884.20	788,884.10	578,049.50	$1,849,524.01
Course and student support	519,750.00	315,000.00	315,000.00	$315,000.00

Faculty professional development	145,995.00	145,995.00	145,995.00	$144,788.00
Institutional savings	($10,000.00)	($10,000.00)	($10,000.00)	($10,000.00)
Total cost to institutions	$1,125,629.22	$1,239,879.09	$1,029,044.53	$2,299,312.01
Per-student cost to institutions	1,279.42	810.63	263.36	$19.21
Per-student cost to students	$2,215.00	$2,146.50	2,113.50	$2,147
Total cost per student	$3,494.42	$2,957.13	$2,376.86	$2,165.71
Total students served	318	645	1,196	107,043

Cost data show that implementing college-level courses with cocurricular models is more costly than implementing transfer-level courses without those supports. In both math and English, standalone transfer-level courses are less costly than any cocurricular model – an expected finding given cocurricular models offer additional supports beyond what is available in a standalone course. The costs of implementing transfer-level courses with cocurricular supports are largely driven by faculty time on implementation activities. In math, the corequisite model is the least costly with a $2,407.32 per pupil cost, and enhanced courses are the costliest with $5,405.89 per pupil cost. In English, the corequisite model is the least costly with a $2,376.86 per pupil cost, and embedded tutoring is the costliest at $3,494.42 per pupil.

While overall access to transfer-level courses improves both short and longer term outcomes for students (as described in the impact study above), we show in Table 19 that, across all cocurricular models, and for both math and English, coefficients do not reach conventional levels of statistical significance, indicating that **there are no detectable differences in 1-year course completion rates between students who enroll in transfer-level courses with and without cocurricular supports.** Together with the cost analyses in Tables 17 and 18 above, these data suggest while there may be cost differences associated with alternative models of transfer-level course supports, more expensive models may not be more effective in driving 1-year transfer-level course completion rates.

Table 19. Adjusted mean differences in 1-year transfer-level course completion rates between students in cocurricular support models and transfer-level courses without supports.

	Math			
	Coefficient	N Treatment	N Control	N Institutions
Embedded tutor	0.019 (p=0.421)	765	765	12
Corequisite	-0.002 (p=0.891)	2804	2804	26
Enhanced	0.023 (p=0.503)	319	319	6
	English			
	Coefficient	N Treatment	N Control	N Institutions
Embedded tutor	0.019 (p=0.216)	1,578	1,578	17
Corequisite	-0.018 (p=0.234)	1,819	1,819	18
Enhanced	0.017	798	798	13

	(p=0.614)			

Limitations

This study is not without limitations. We first acknowledge limitations to the identification strategy used to estimate effectiveness estimates, noting our matching approach cannot account for all observable and unobservable differences between treatment and comparison students. We consider our effectiveness estimates as descriptive associations rather than causal impact estimates. We also note that our effectiveness estimates are drawn from relatively small samples, particularly with respect to the number of institutions. For example, the analysis estimating differences in math course completion rates between students in enhanced courses and students in standalone transfer-level courses are drawn from a sample of 638 students across six institutions. In addition, findings from our implementation study evidence varied responses even within cocurricular models, making it difficult to identify effects associated with a given model. We also acknowledge that cost estimates are drawn from a sample of 11 institutions and our estimates may not be generalizable to institutions outside of our sample.

Conclusion

This study builds upon existing research and provides quasi-experimental evidence of increased enrollment in, and completion of, transfer-level math and English coursework among students of all academic and racial backgrounds following the implementation of AB 705. In addition, we offer what we believe are the first quasi-experimental estimates of the impact of AB 705 reforms on long-term educational attainment measures like credential attainment and transfer to public universities. Our results indicate that enrollments in transfer-level math and English are associated with significant gains in throughput, credit accumulation, and academic achievement as measured by GPA. Enrollment in transfer-level coursework is also significantly associated with improved credential attainment and transfer success. Findings from the ITS and DID studies indicate that students with middle and low prior achievement are seeing the most positive and consistent effects from AB 705 reforms. These students experienced gains in enrollment and completion of transfer-level coursework, and are more likely than similar pre-policy students to complete associate degrees and transfer to a four-year institution. From our ITS models, we also find that Black and Hispanic/Latinx students have experienced significantly greater gains in transfer-level course enrollment and completion, suggesting that these reforms have helped to narrow gaps for these racially minoritized and historically underserved populations.

Our cost study analyses find that transfer-level courses with cocurricular supports are more costly to implement than enrolling students in standalone transfer-level courses without additional supports. We also find no detectable differences in 1-year course completion rates associated with these additional supports. However, our implementation study findings suggest that institutions are continuing to experiment with cocurricular supports and structures, and there persists wide variation in how institutions are implementing these reforms. We also note that our effectiveness estimates show descriptive associations and stand in contrast to prior work using experimental approaches that show short- and long-term benefits of additional supports, such as corequisite remediation (e.g., Douglas et al., 2022). Findings should be interpreted with these limitations in mind.

Our implementation study finds that many institutions are still iterating on the designs of their course supports and struggling to effectively target these supports to the students who need them most. This may be partly because most institutions believe that the laws do not currently permit them to require certain students to enroll in supports. This may also be related to the difficulty many institutions reported with accessing and utilizing campus data to support implementation, suggesting that more can be done to

encourage partnerships between faculty and institutional researchers. Despite these challenges, our faculty survey findings indicate that support for these reforms appears to be growing among both math and English faculty, as institutions leverage funds provided by the CCCCO to provide professional development aimed at nurturing growth mindset and helping faculty adopt equity-minded practices.

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