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

Final Report - June 2026

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Introduction

Many students entering community colleges are assessed unprepared for college-level math and English courses. These students are typically required to enroll in developmental education (DE) courses designed to improve their academic preparedness for college-level standards. However, a large body of evidence has emerged suggesting that DE requirements more often serve as a barrier to students' degree completion. Students placed in DE commonly 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 (Bailey et al, 2010; Boatman & Long, 2018; Clotfelter et al., 2015). 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, Latine, and Indigenous students in DE (Chen & Simone, 2016), creating opportunity gaps between those students and their White and Asian peers.

In response to this research highlighting the harmful and racialized impacts of DE, many states have introduced reforms that modify DE placement policies, loosen DE requirements, and/or alter curriculum and pedagogy. For example, Florida's 2014 reform required the state's community colleges to make DE coursework optional, with entering students exempt from placement testing (Park-Gaghan et al., 2020). In Texas, a 2017 reform required community colleges to implement and scale up corequisite models to support students (Meiselman & Schudde, 2022). Similar DE reform models were introduced in Tennessee in 2015 (Ran & Lin, 2022) and in Louisiana in 2022 (Louisiana Board of Regents, 2022).

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. Policymakers and practitioners in California have been working to improve student equity and outcomes through placement and curricular reform for over three decades. While multiple measures assessment has been recommended for use in placement since 1991, placement tests were still the predominant measure used by community colleges to determine college readiness until recently (Duffy et al., 2014). The majority of incoming students, particularly Black and Latine students, were placed into remedial coursework and very few students went on to complete gateway courses needed for transfer, due to high attrition rates (Cuellar Mejia et al., 2020).

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 legislation requires all California community colleges to use high school transcript data to assess college readiness and inform students' introductory English and math course placements, to "maximize the likelihood that the student will complete transfer-level[1] English and math within one year". AB 705 took effect in January 2018, with implementation of curricular reforms required by fall 2019. The law was also considered a racial equity mandate, as the language of the law includes the fact that students of color had historically been disproportionately placed into DE course sequences. To support institutions' implementation, the 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, CCCCO guidance made it clear that 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: Closing the Gaps

In September 2022, assessing that institutions were not making adequate changes in response to AB 705, the legislature passed AB 1705. 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 also prevents colleges from making students repeat coursework they've already passed in high school.

Responding to research indicating that some Black and Latine 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, 2024), AB 1705 further required that by July 2024, all colleges would limit the pathway to STEM Calculus to two transfer-level prerequisites. AB 1705 originally required colleges to enroll STEM students directly into Calculus as their first transfer-level STEM math course starting in July 2025.[3] A December 2024 memo permitted colleges to continue offering up to two semesters of transfer-level Calculus prerequisites. This 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.

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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 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.

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 study contributes 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. Additionally, 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.

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 (Cuellar Mejia & Wigul, 2026; RP Group 2019; 2021; 2025a). However, research has suggested that equity gaps in completion have persisted between Black and Latine students and their White peers (RP Group, 2019; 2025a), although gaps appear to be closing (Cuellar Mejia & Wigul, 2026). Completion rates among older students (>25) have risen in recent years, as has math completion among female students (Cuellar Mejia & Wigul, 2026). These authors also note that completion patterns in math differ by pathway: while success rates in Statistics and Liberal Arts Math (SLAM) have been rising, those in STEM math courses lag significantly behind (Cuellar Mejia & Wigul, 2026).

Enrollment in Concurrent Support. Colleges were encouraged by the Chancellor's Office to provide cocurricular supports for their transfer-level math and English courses to promote student success, particularly among those students who might have otherwise been placed in DE. However, a recent study (RP Group, 2026) found that while nearly all colleges offer corequisite support for some sections of transfer-level math and English, only 10% of English and 12% of math students enroll in these sections, with section counts and enrollments declining since their 2019-2020 peak. Further, the study indicated that enrollments in these corequisite sections were composed primarily of higher-performing students, rather than the "low-placement-profile" students for whom they were intended, especially in English and SLAM. This aligns with our findings, described below, that colleges have offered fewer sections with cocurricular support over the course of the study, and helps to explain why we do not see the benefit to student outcomes associated with enrollment in these sections that we might expect.

Another recent study, which looked at the combined effect of corequisite-paired and enhanced courses, found that enrollment in concurrent support increased from 2022 to 2024, but still found that standalone SLAM and STEM math courses had higher success rates than their concurrently supported counterparts (Cuellar Mejia & Wigul, 2026). This provides additional suggestive evidence of the compositional effects of student self-selection into these courses.

Transfer and attainment outcomes. Scholars have found that rates of transfer to four-year colleges and associate's degree attainment have increased 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). Others have found improvements in two-, three-, and four-year outcomes, observing that transfer rates have improved most among Asian and Latine students, and among female students (Cuellar Mejia & Wigul, 2026).

Purpose of this Final Report

Researchers from Research for Action (RFA) and the University of Texas at Austin have been 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 final report, presented at the conclusion of year five of the study, summarizes our learnings across the three studies.

Table 1. Research Questions

Study	Number	Research Question(s)
Implementation Study	RQ1	How are California community colleges implementing curricular reforms? How do institutional policies and practices regarding curricular reform vary across colleges?
	RQ2	How does institutional capacity affect institutional adoption and implementation of curricular reforms?
	RQ3	How do policies and practices in math and English departments vary within colleges?
	RQ4	How does faculty buy-in vary between math and English departments, and why?
Impact Study	RQ5	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?
	RQ6	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?
	RQ6a	Does the overall policy effect vary across different socio-demographic student groups?
Cost Effectiveness Study	RQ7	Are introductory, transfer-level courses with or without cocurricular support more cost-effective than DE courses as a whole (corresponding to RQ4)?
	RQ8	Which cocurricular support model is the most cost-effective (corresponding to RQ5)?

Implementation Study

Our implementation research was focused on four research questions aimed at understanding **what** implementation has looked like, **who** has been implementing these reforms, and **how** these reforms have been experienced and vary across institutions. More specifically, the research questions on implementation are as follows:

- RQ1. How are California community colleges **implementing curricular reforms**? How do institutional policies and practices regarding curricular reform **vary across colleges**?
- RQ2. How does **institutional capacity** affect institutional adoption and implementation of curricular reforms?
- RQ3. How do **policies and practices** in math and English departments vary within colleges?
- RQ4. How does **faculty buy-in** vary between math and English departments? Why?

This section of the report will answer each of these research questions in order, highlighting key findings from across the study, focusing on cocurricular reforms and instructional support strategies, institutional capacity and buy-in for the reforms, and variation across math and English departments.

Data Sources

These findings are drawn from several data sources:

- **Departmental spreadsheets**. Each year of the study, beginning in 2021, we sent spreadsheets to each math and English department across the California community college system to collect data on each introductory gateway course section in English and math, as well as information regarding the structure of the course (i.e., stand-alone, corequisite, enhanced), and additional supports (e.g., embedded tutors, supplemental instruction). Individuals completing these spreadsheets received a $25 gift card. These section-level data support our understanding of broad implementation trends across the system, as well as supporting our Scale of Implementation classification and site visit sampling. This data collection was voluntary, and our response rates have ranged across the five years of the study, with a high of 64% of colleges providing these data in 2021-22 and a low of 40% of colleges participating in 2025-26.
- **Interviews with faculty and administrators.** We conducted in-depth fieldwork in study years 2 (AY 2022-23) and 4 (AY 2024-25) at 15 California community colleges, including 60-minute interviews with math faculty (n=55), English faculty (n=50), department administrators (n=61), student services administrators (n=54), academic administrators (n=37), and counselors (n=22) to better understand implementation of AB 705 and 1705 reforms. These colleges were 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. Our year 2 sample included 4 high implementers, 5 middle, and 4 low implementers, and our year 4 sample included an additional high and middle implementer. Sampled colleges were smaller on average than unsampled institutions, but enrollments of Black and Latine students were comparable, as were the prevalence of enhanced courses and embedded tutors. We oversampled institutions offering corequisite courses so that we could better understand the variation and implementation of that model. Additional details about the Scale are available in our year 2 report

(Burkander et al., 2024), and more information about our site selection is in our year 4 report (Burkander et al., 2025).

- **Student focus groups.** During our site visits in year 2 and 4 at our 15 partner California community colleges, we also conducted 30-60 minute focus groups (n=92) with students (n=934) in introductory transfer-level math and English classes. Classes were identified by our college contact, and all students in those classes were offered the opportunity to participate in the focus groups, with no penalty for non-participation. Students were provided $15 gift cards for their participation.
- **Faculty survey.** Our fieldwork data are complemented by a survey administered to all math and English faculty at our 15 site visit institutions in spring 2024 (n=121), spring 2025 (n=142), and spring 2026 (n=72). Faculty members received $25 gift cards for completing the survey. The survey was developed to address four constructs: institutional capacity, faculty buy-in, pedagogy, and faculty mindsets. Each year of survey administration, we obtained math and English department rosters from our sample institutions and sent personalized survey links to all full- and part-time faculty members. Our response rates were as follows: 26% in 2024, 20% in 2025, and 23% in 2026. Demographic characteristics of the full survey sample are provided in Appendix A.

Analytic Methods

The interview and focus group findings below are synthesized from our 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 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). Detailed findings from our site visits in years 2 and 4 are summarized in prior interim reports. Below we highlight larger takeaways from the full complement of student focus group and interview data with math and English faculty and administrators, as well as survey data from faculty regarding their implementation of AB 705 and 1705 reforms.

Implementation Study Findings

This report presents findings associated with our four implementation study research questions, aimed at understanding **institutional implementation** across the system, how **institutional capacity** influences implementation**,** and **comparisons between math and English departments** regarding their implementation and support for reforms.

Institutional Implementation

In answering part one of RQ1 (i.e., *How are California community colleges implementing curricular reforms?*) our first research activity was classifying each institution on a Scale of Implementation developed by our research team. Following other research which used the percent of introductory courses offered at transfer-level as an indication of implementation strength (Hern et al., 2020), we used this metric as well as several others that we believed would serve to identify meaningful variation in implementation. We evaluated colleges on this Scale in year 1 of the study and again in year 5 to assess change over time in institutional implementation.

Original Classification

While all California community colleges were required to revise their placement policies in accordance with the laws, AB 705 did not prescribe a specific implementation approach, so a traditional fidelity of implementation study does not work in this context. In order to understand variation in implementation and identify a diverse sample of colleges for our site visits, the research team developed a Scale of Implementation that relied on four indicators: 1) proportion of introductory courses offered at transfer-level; 2) prevalence of cocurricular supports; 3) placement measures used in math and English; and 4) placement guidance provided to students. Indicators 1 and 2 were obtained through the Departmental Spreadsheets collected from colleges across the system. We used data from the AY 2021-22 administration, which included 65 spreadsheets from math departments and 64 spreadsheets from English departments. Because implementation of AB 705 tended to be more complicated in math departments, due to the multiple math pathways available to students, we included in our sampling frame all institutions (n=65) that had submitted at least a math spreadsheet. Indicator 3 was obtained from a survey conducted by the CCCCO, and Indicator 4 was obtained through web review by our research team.

We binned the percent indices (Indicators 1 and 2) into quintiles and assigned values from 1-5. We assigned each college an Indicator 3 value (1-3) based on colleges' responses to the CCCCO survey, and an Indicator 4 value (1-5) based on AB 705 messaging directed to students available on the website. Composite scores across indices were summed, and colleges were binned into quintiles (1-5), yielding a group of colleges at the low (1), middle (3), and high (5) end of implementation. We used these implementation bands to sample 5 institutions at each level, with consideration for region, institutional size, student demographics, urbanization, and variation in cocurricular supports offered. More information about the development of our Scale of Implementation and site sampling is available in our year 2 report (Burkander et al., 2024).

Updated Classification

We updated our classification of each institution on our Scale of Implementation in year 5 to evaluate how colleges had changed over time. We restricted the sample to colleges for which we had at least two timepoints of spreadsheet data (n=55). Indicators 1, 2, and 4 were collected and assigned values in the same way as in year 1. For colleges that did not provide 2026 spreadsheet data, we used the most recent year of spreadsheet data available to populate Indicators 1 and 2.

Indicator 3 in year 1 relied on a 2021 placement survey administered by the CCCCO; this survey was not re-administered. For the year 5 ranking, we utilized responses from a 2026 survey administered by the RP Group regarding colleges' approaches to placement under AB 1705. We gave all responding colleges a value (1-3) based on their survey responses. While the 2021 survey had a score for English and math, the 2026 survey had just one score for math. Colleges without 2026 survey responses had their 2021 math survey values populated for Indicator 3.

We created a composite score from the sum of the four indicators collected for 2026. Because the placement survey included a score for each department in 2021, but only a math score in 2026, we recomputed the 2021 composite scores using only the math score. We then recomputed ranking bins (1-5) based on quantiles calculated from the recomputed 2021 data. Finally, we assigned colleges to a ranked bin based on their scores in each of 2021 and 2026.[4] Figure 1 below shows the change in Scale ranking over time.

Figure 1. 5-year change in college rankings on the Scale of Implementation (n=55 colleges), 2021-22 to 2025-26

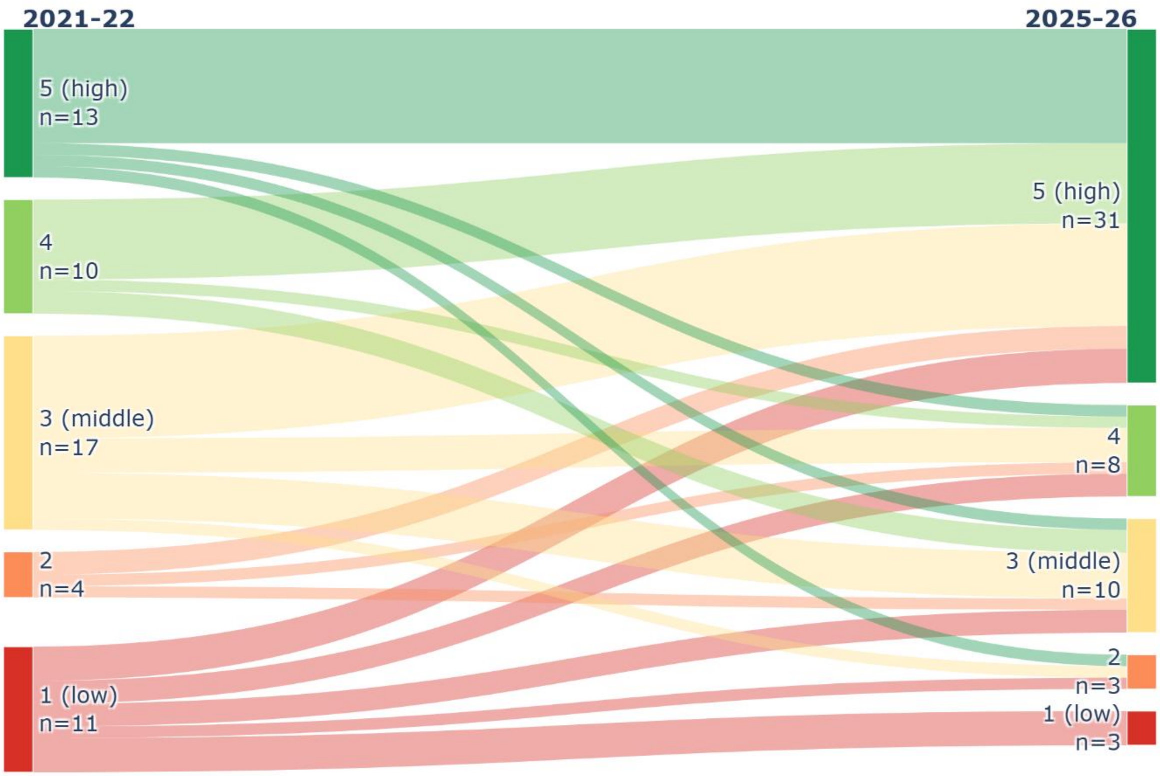

Figure 1 above demonstrates that overall, colleges have improved their rankings on the Scale of Implementation. We see that in year 1, 13 colleges were ranked as high implementation colleges, and in year 5, that number grows to 31, or 56% of the sample. While we do not have data from the rest of the system's colleges, we believe this mirrors trends observed around the state. Similarly, the number of colleges ranked as low implementation colleges shrinks from 11 in year 1 to 3 in year 5. However, we do see a fair amount of movement between levels, with some high implementation colleges dropping lower on the scale over the course of the study. This is likely due to changes over time in Indicator 2, the percent of introductory courses with cocurricular support. As noted in our previous reports and below, many colleges have reduced or discontinued their use of corequisites and other cocurricular supports in their introductory courses due to administrative complexity, lack of student demand, and/or a lack of clear improvement in student outcomes tied to cocurricular supports.

However, when we look just at how colleges changed in terms of Indicator 1, the percent of introductory math courses offered at transfer-level—perhaps the most direct measure of implementation of AB 705—we see a much clearer pattern of improvement over the course of the study, as shown in Figure 2 below.

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[4] The recomputed 2021 scores were different from the original scores for all colleges, since the recomputed scores excluded one component with a possible value ranging from 1-3. However, most colleges were binned into the same quantile of data with the new score. Only 9 colleges (16% of the sample of 55) changed quantiles and those that did only changed one quantile ranking. Three were in a higher quantile ranking and 6 were in a lower quantile.

Figure 2. 5-year change in percent of introductory math courses offered at transfer-level (n=55 colleges), 2021-22 to 2025-26

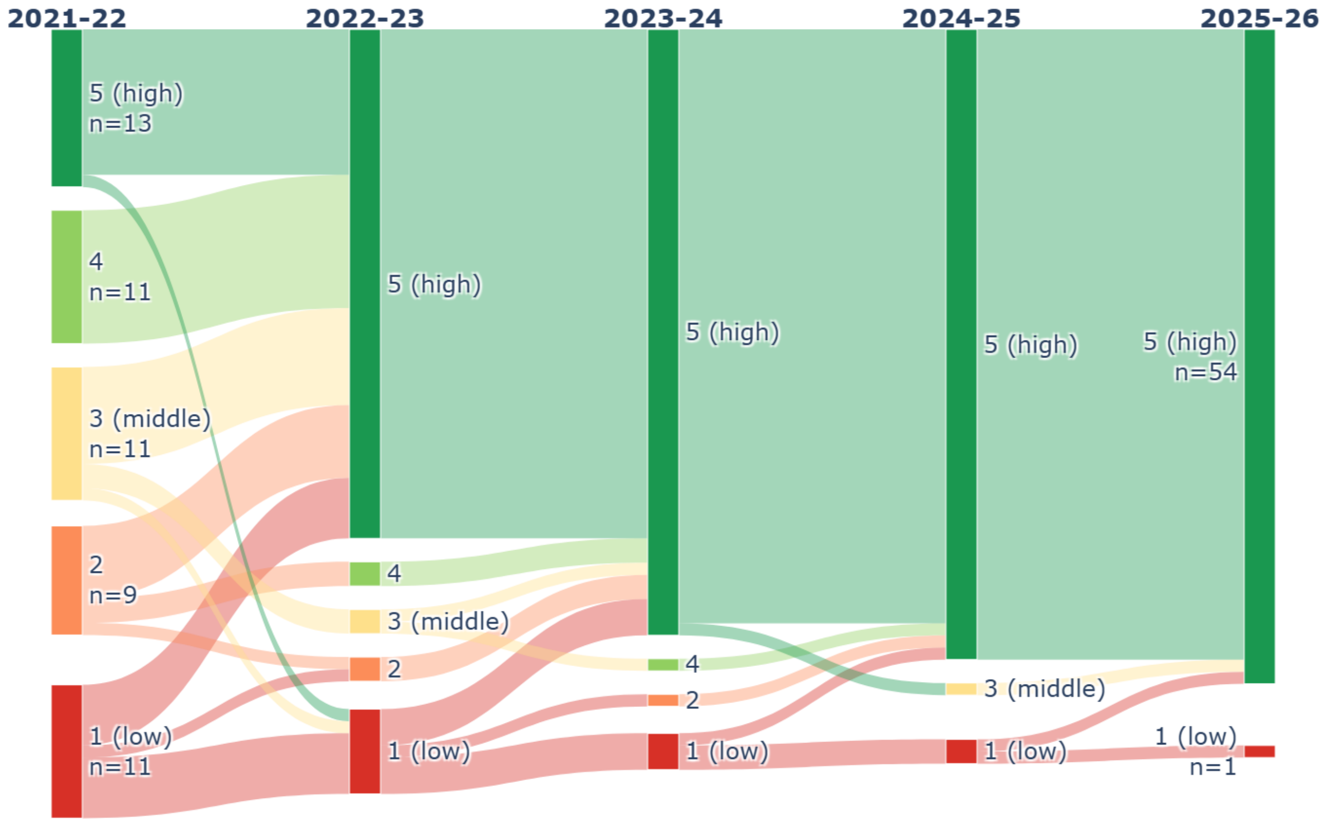


Figure 2 visualizes the incremental impact of AB 705 on colleges' introductory course offerings over time. In year 1, only 13 colleges were ranked in the highest implementation band on Indicator 1 with at least 93% of introductory math courses offered at transfer-level, but by year 5 all but one institution is in the highest band. While we see some fluctuation across years, the overall trend is clear and positive in response to the reform. We are again limited to observing this trend among the colleges providing these data, but we believe this pattern is consistent throughout the state. These figures serve to illustrate that despite the challenge of COVID and responding to other policies during the study period, colleges across the California system have worked diligently to reform their introductory course placement to maximize access to transfer-level coursework for all students.

Implementation of Cocurricular Supports and Instructional Strategies

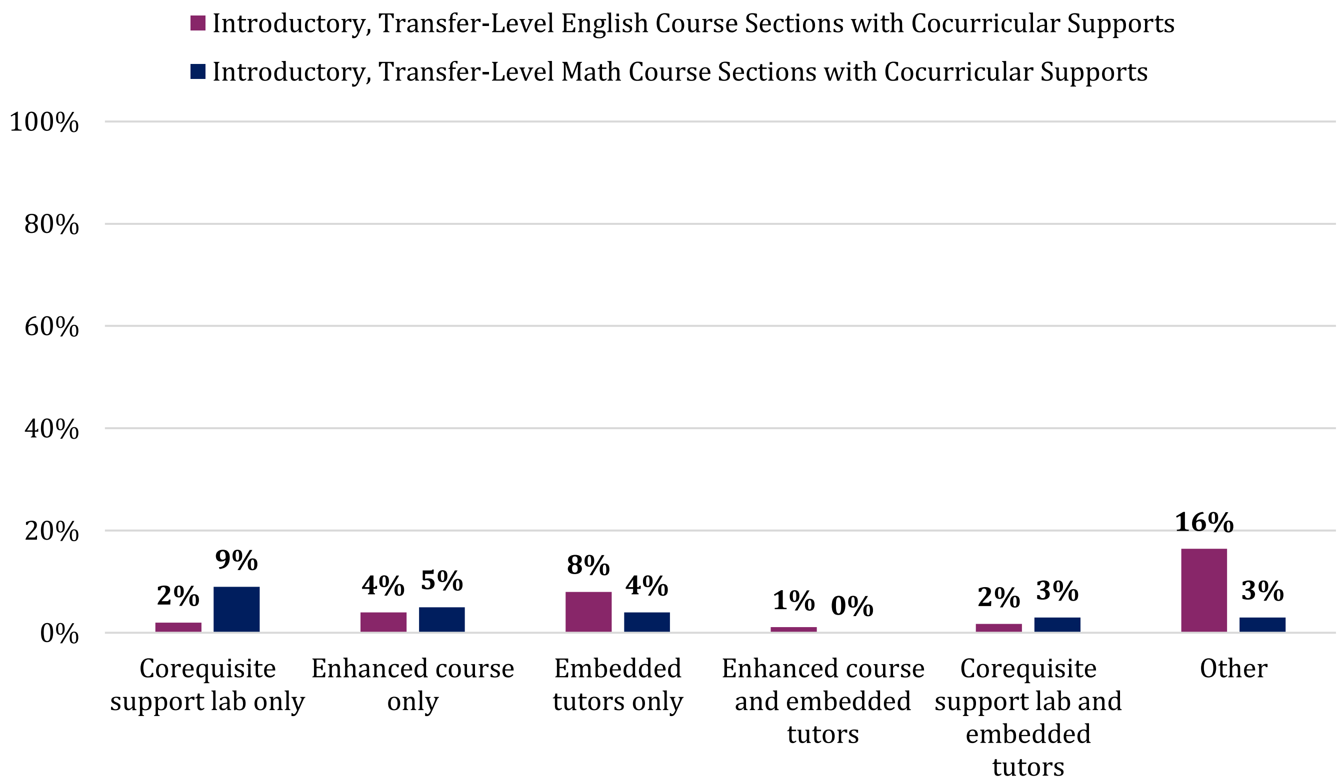
In order to explore part two of RQ1 (i.e., *How do institutional policies and practices regarding curricular reform vary across colleges?*), the study focused on the adoption and implementation of cocurricular reforms. As colleges have been required to place all students directly into transfer-level math and English coursework, they have been encouraged to offer cocurricular supports to help students succeed. Among the participating colleges that provided spreadsheet data in the 2025-26 academic year (AY), the three most frequently reported cocurricular supports are listed and defined in Table 2 below.

Table 2. Cocurricular supports and descriptions

Cocurricular Support	Description
Corequisite Course	Course section has a primary lecture and separate paired academic support lab, which can either be required or optional
Enhanced Course	Course section is primary lecture with additional credit(s) to provide extra instructional support
Embedded Tutors	Course section has tutors assigned to the section who provide support to students inside and outside the classroom

Nearly all colleges in our sample offer at least one section of introductory, transfer-level English and math courses with some form of cocurricular supports (only two institutions out of 42 did not offer any English sections with cocurricular supports; all institutions in our math sample offered at least one section with supports). However, if you look at the share of total course sections with cocurricular supports across our sample, few have any cocurricular supports (33% of English course sections, 24% of math sections), therefore access to these supports is limited. Figure 3 below shows the frequency with which each of these supports were used in course sections offered during the 2025-26 academic year (AY), among colleges who completed our data collection spreadsheets.

Figure 3. Most frequently used cocurricular supports in introductory, transfer-level English and math course sections during the 2025-26 AY (n= 42 community colleges for English, 41 community colleges for math)



Note: “Other” includes different support configurations, such as a standard course with both embedded and outside tutors or only outside tutors and a standard course with a learning community and a required corequisite with embedded tutors and counselors, among others.

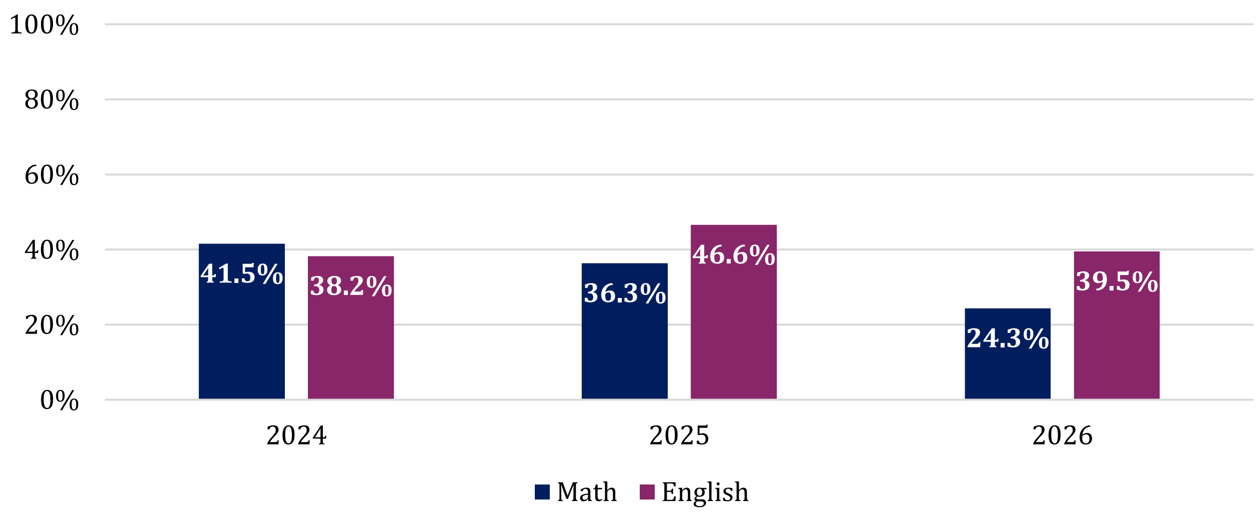
The corequisite model and embedded tutoring, either individually or in combination with another model, were the most common cocurricular support models. As can be seen in Figure 3 above, among the community colleges that completed spreadsheets for the 2025-26 academic year, the corequisite model was offered as the only cocurricular model in 2% of English and 9% of math introductory, transfer-level course sections, decreases in both subjects from the previous year (not pictured, the rates were 7% of English sections and 16% of math sections in the 2024-25 AY; Duffy et al., 2025). An additional 2% of English and 3% of math introductory, transfer-level course sections offered the corequisite model in conjunction with embedded tutoring, for a total of 4% of English and 12% of math introductory, transfer-level course sections offering corequisite support. Embedded tutoring was offered as the only cocurricular model in 8% of English (an increase from the previous year) and 4% of math introductory, transfer-level course sections (a decrease from the previous year), and in combination with the enhanced model in 1% of English introductory, transfer-level course sections, but not in math. It is also worth noting that at least two-thirds of introductory-level course sections in English (67%) and math (76%) did not offer any cocurricular supports.

The following discussion will highlight key lessons learned on each of these cocurricular reforms.

Corequisite Course Model: Variation and Challenges

Despite the corequisite model being one of the most common types of cocurricular reforms, most participating community colleges offered the model in no more than 12% of their introductory, transfer-level English and math sections, and have experienced decreases in its use (Duffy et al., 2025). This may align with findings from survey data on faculty perceptions of the effectiveness of the corequisite model, as shown in Figure 4.

Figure 4. Percentage of faculty responding that corequisite support labs are "very" or "extremely effective", by subject



Note: Sample sizes for math faculty are as follows: 2024 n=53; 2025 n=54; 2026 n=37. Sample sizes for English faculty are as follows: 2024 n=68; 2025 n=88; 2026 n=38.

Fewer than half of faculty reported that the corequisite model was very or extremely effective across years, with that percentage among math faculty decreasing each year. As shown in Figure 4 above, the percentage of math and English faculty who completed the survey and reported that the corequisite model was very or extremely effective never reached 50%. The percentage of math faculty reporting that the corequisite model was very or extremely effective peaked in 2024 at 41.5% and decreased in the following two years, ending at below a quarter of faculty (24.3%). Perceptions of effectiveness among English faculty was higher than in math in 2025 and 2026, peaking in 2025 at 46.6%.

Implementing corequisite courses can vary widely in several areas. Corequisite courses have not been implemented in the same way across institutions, departments, or faculty members in California Community colleges. Corequisite courses can vary in many ways, such as the timing of academic supports, the characteristics of faculty assigned to the courses, the instructional modalities utilized (e.g., online vs. in-person, with or without embedded tutoring), the math pathways available through the courses (e.g., quantitative reasoning, statistics, or algebra-based), and the class composition and size (Ryu et al., 2022). Building on this framework, study participants at sample community colleges identified the following common variations across corequisite courses:

- **The same instructor did not always teach the introductory, transfer-level course and related support lab.** As was also found by Ryu and colleagues (2022), one of the structural elements that varied in our sample colleges was whether the same instructor taught both the main and support courses. When the instructors are different, they must work to align their course content and assignments; otherwise, misaligned courses can result in confusion for students and faculty.
- **The timing of the academic support varied.** In the corequisite model, additional academic support is provided in a support lab adjacent to the main course, but there was still variation in the support lab schedule in some cases: they could be scheduled immediately before or after the main course or on a different day from the main course.
- **The support lab was sometimes used to provide additional content instead of support on course material covered in the main course.** The primary purpose of the support lab is to provide additional support to ensure success in the main course. However, students and faculty at several colleges expressed concern that the support labs were used to deliver new content rather than providing academic support on the content from the main course. This was especially true in math courses, where some faculty used the support lab to teach additional content (e.g., algebra content in a support lab for a statistics class).
- **Support labs were provided in-person and online.** As mentioned by Ryu and colleagues (2022), there was also variation in whether support labs were available online or in-person. Some faculty in our sample asserted that corequisite courses were only effective in person.
- **Corequisite courses sometimes included embedded tutors and/or learning communities.** Embedded tutors are typically community college students who have successfully completed an introductory math or English course and then are recruited to provide support to students in that course. While some faculty have embraced these tutors as a resource and found value in the model, others have been reluctant to collaborate with them in the classroom. Similarly, in some cases course sections were reserved for students in a learning community, such as the Puente program[5].

Along with these variations, a number of challenges with the corequisite model were also identified:

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[5] Learning communities provide academic and non-academic support to a cohort of students based on similar backgrounds or interests. This often includes enrollment in the same introductory course sections, as well as mentoring and other services, thereby creating a supportive community and environment for students. The Puente program provides one example of this model, focusing primarily on supporting Latine students.

- **Student enrollment in corequisite courses is typically recommended but not required.** In 2019, PPIC found that over half of colleges implemented placement policies that made enrollment in corequisite courses recommended or optional instead of required (Cuellar Mejia et al., 2020). This aligns with the findings from our 15 case study institutions: most did not require students whose placement results fell below a particular threshold to enroll in sections of introductory, transfer-level courses utilizing the corequisite model. Faculty also reported that students who needed the support most were often not enrolling in the corequisite sections for a number of reasons, including confusion among students about the support lab options, limited time in student schedules to enroll in a supported section due to the additional unit load, and limited section availability due to faculty capacity to teach a supported section. Despite the law allowing colleges to require enrollment, interview respondents reported that many college personnel were reluctant to make corequisite course enrollment mandatory for some students, reflecting a lack of clarity around AB 705.
- **Registration processes for corequisite support labs can be confusing for students.** Unlike the enhanced course model in which the lecture and support portions happen in the same class period, the corequisite model typically requires enrollment in two individual courses. These two courses are linked in the registration software so that when students enroll in the main course, they are prompted to enroll in the support lab as well. Faculty respondents described the registration process with the corequisite model as cumbersome and acknowledged that it can be confusing to students. Numerous faculty and administrators also reported difficulties encountered in programming the two paired courses into their registration systems. Three of the case study institutions shifted from the corequisite to the enhanced model to overcome such registration challenges.
- **There can be a large unit load with the corequisite model.** Along with the number of units for the transfer-level course, a support lab attaches additional units to the overall unit load for a student. PPIC found that corequisite courses most commonly had a total of six units (Cuellar Mejia et al., 2020). In contrast, the enhanced model offers an option for support with fewer units. While the additional unit(s) represent opportunities for increased academic support, they also have time and cost implications for students and can thus be less accessible to students with limited time and financial resources. The additional credits associated with the support portion are also not transferable. Further, faculty shared that students who see English or math as difficult may be less interested in spending additional time in these classes.
- **The level of faculty professional development and support did not always reflect the challenge of implementing the corequisite model.** Community college faculty often have limited pedagogical training, and the implementation of corequisite courses presents considerable instructional challenges. In response, colleges provided varying levels of professional development to support faculty in meeting the needs of students through these reforms. While some colleges or academic departments required faculty teaching corequisites to participate in professional development and/or communities of practice, others did not. Professional development at individual institutions was most often left to faculty peers who had limited experience and expertise in some cases.
- **Grades for main corequisite course and paired support lab may be different.** Since the transfer-level course and the support labs are separate, it is possible for students to pass one and not the other. If a student passed the support course but not the main course, it may mean that they cannot retake the support course even if they need additional support to retake the main course. In response, some colleges decided to make the support lab ungraded or pass/fail, determining the overall grade for the course based on the main course alone.

The variation and challenges in implementation outlined above may help to explain in part why the utilization of this model has been more limited than might be expected in California. In response to these issues, some colleges have shifted to the enhanced course model to provide student support in the classroom.

Enhanced Course Model: Combining Instruction and Support

Some colleges have chosen to bundle the main and support courses into a single, extended class session rather than having them as two separate courses; we call this the “enhanced” model. None of the sample colleges were implementing this model prior to AB 705. Of the sample colleges implementing this model, it was most commonly found in the English department, often in response to concerns regarding the corequisite model based on the challenges discussed above.

A number of early successes were identified regarding the enhanced course model, including the following:

- **Extra time to build skills and community.** Similar to the corequisite courses, enhanced courses afford extra time to cover the content at a slower pace and incorporate community-building strategies to increase students’ comfort with asking for help.
- **Students receive additional support with less time and fewer additional credits.** Enhanced courses can provide similar levels of additional support as the corequisite course, by adding just one credit to the single course.
- **Additional support without the registration confusion.** Colleges which have adopted this model have indicated that the registration process is more easily understood and implemented than the paired course model.

At the same time, challenges were also identified, including the following:

- **All course credits may not transfer.** We heard that some of the enhanced course credits may not transfer to the CSU or UC system, which creates confusion for students and may serve as a disincentive. Given that a goal of the law is to promote transfer, this raised concerns among many of our respondents.
- **Student skill levels vary widely.** As with corequisite sections, the variation in student ability in enhanced sections requires differentiated instruction, which can be challenging for faculty.
- **Enhanced sections are voluntary.** Students who may benefit from this model may choose instead to enroll in a section without support rather than selecting a course that is longer and carries more credits.
- **Longer classes can affect engagement.** Faculty shared the concern that students’ attention can drift and it can be difficult to keep them on task for long periods of time.

Embedded Tutoring: A Promising Practice

The embedded tutoring model can be thought of as a hybrid between traditional tutoring and supplemental instruction, as shown in Table 3 below. Unlike traditional tutoring and supplemental instruction, embedded tutoring provides support both during and outside of class time and does not require students to seek out a tutor in order to receive the support.

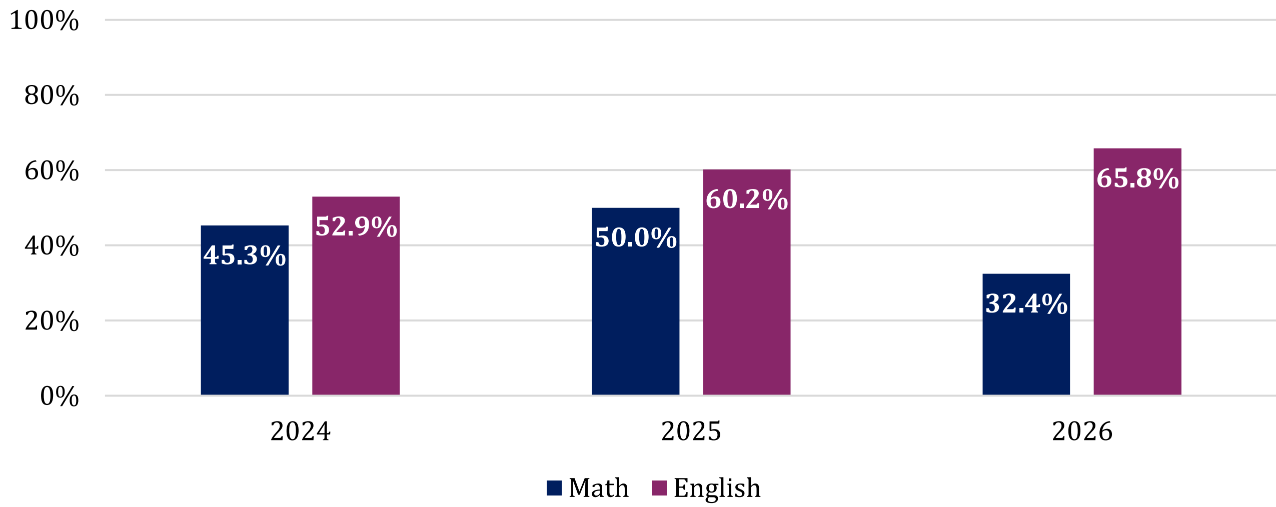
Table 3. Comparison between tutoring models

Tutoring Model	Description
Traditional Tutoring	Voluntary academic support provided one-on-one in the tutoring center
Supplemental Instruction	Voluntary group instruction offered by the tutor outside of class

Embedded Tutoring	Academic support provided in collaboration with the instructor during class time, along with group and/or individual tutoring offered outside of class

Figure 5 below displays the percentage of math and English faculty who participated in the annual survey and reported that embedded tutoring was very or extremely effective.

Figure 5. Percentage of faculty responding that embedded tutoring is "very" or "extremely effective", by subject



Note: Sample sizes for math faculty are as follows: 2024 n=53; 2025 n=54; 2026 n=37. Sample sizes for English faculty are as follows: 2024 n=68; 2025 n=88; 2026 n=38.

While over half of English faculty reported that embedded tutoring was very or extremely effective across survey years, perceptions among math faculty were more mixed. As shown in Figure 5 above, more than 50% of English faculty who completed the survey reported that embedded tutors were effective; further, the percentage increased each year and peaked at nearly two-thirds (65.8%) in 2026. In math, exactly half of faculty respondents (50%) reported that embedded tutoring was a very or extremely effective model; in 2024 and 2026, however, the percentage of math faculty was below half (45.3% in 2024 and 32.4% in 2026). At the study colleges implementing the model after AB 705, faculty and students both praised embedded tutoring, with some faculty calling the model “a game changer” and students describing their tutors as “extremely helpful.”

The six main strengths associated with embedded tutoring, based on the perspectives of community college faculty, administrators, and students in California include the following (Duffy et al, 2024):

- **The model does not require students to spend additional time and funds on coursework.** Students are often unable to spend a significant amount of time on campus, so an embedded tutoring program can help to address this issue while allowing students to access academic support resources. Across multiple case study sites, respondents reported that with the corequisite model, the additional time and credits required, and the additional tuition cost were deterrents for students to sign up for introductory courses with a support lab. In contrast, the use of embedded tutors as a part of the course itself provides additional support during scheduled class time, without requiring students to spend additional time and money for the support.

- **Embedded tutors are seen as more approachable than faculty.** In our interviews and focus groups, students and faculty reported that students are more comfortable speaking with tutors than faculty because they are "more of a peer who can help them." For example, one faculty member explained that because "tutors are [the students'] peers, it makes them approachable… comfortable." A student similarly mentioned that "some people might be afraid to go talk to the instructor… with the tutor that's like another student and you don't have to be afraid to talk to that person."

- **Embedded tutors are familiar with the course content and faculty expectations.** In California, embedded tutors were typically students who had taken the class before with the same instructors and were therefore familiar with how the class is structured and the content covered. Students shared that collaborating with an embedded tutor was more helpful than working with other members of the tutoring center staff because "you don't have to explain… [and] waste your breath and time [because the tutor] already knows" what is taking place in the course and what is expected by the instructor.

Cocurricular Model Spotlight: Embedded Counseling

Although not yet a commonly implemented cocurricular support, embedded counseling has been developed in two sample community colleges. In one study college, a partnership was created between the counseling and English departments, pairing a counselor with each section of English composition to provide holistic supports and intrusive advising to students. Faculty reported that this partnership was effective, and students shared that developing a relationship with a counselor made seeking support feel more accessible. In the second study college, embedded counseling was a much lighter touch, with a counselor visiting English courses once in the beginning of the semester.

- **Embedded tutors help provide individualized instruction to students.** Providing students with "just-in-time" remediation that helps to address skills that students have not yet developed or were never exposed to takes considerable personal attention from instructors. Leveraging an embedded tutor to help provide assistance to students as they work through assignments, whether in or outside the classroom, can provide critical additional capacity to faculty responsible for the course. Students in our case study institutions reported that it was helpful to have another resource person in the room "because a teacher can't help everybody in the class, so… [with the embedded tutor] everybody's getting the help that they need."

- **Embedded tutors interact with all students in the class, not just those who seek out tutoring.** The faculty interviewed in case study sites commonly reported that embedding the tutors in the classroom reduces the stigma associated with seeking help. For example, one instructor explained that "the tutoring center [does not feel] so distant [to the students when you]… have a tutor in the classroom" with whom students have already built rapport. As a result, embedded tutoring can extend the benefits of social interaction and support to all students.

- **Embedded tutors help students not only learn course content but also develop study skills.** In the California case study sites, many faculty recognized the need to provide students in their introductory math and English classes with study skills in addition to the course content. Part of instructional support, according to one English instructor, is "not just teaching students… but showing them what being in college is like." Similarly, a math instructor shared the importance of teaching "study skills, how to be a college student, time management… not just math."

At the same time, an embedded tutoring program requires the **recruitment and retention** of the tutors and **extra time from faculty** to work with the tutors outside of class to coordinate instructional strategies, as well as **training for tutors and faculty**, all of which can present challenges (Duffy et al, 2024).

Institutional Capacity

In response to RQ2 (i.e., *How does institutional capacity affect institutional adoption and implementation of curricular reforms?),* we operationalize institutional capacity as the financial, technological, curricular, and/or human resources leveraged to support implementation of reforms. We also consider professional development as well as the ability of colleges to respond to the equity principles of AB 705 and 1705 as components of institutional capacity.

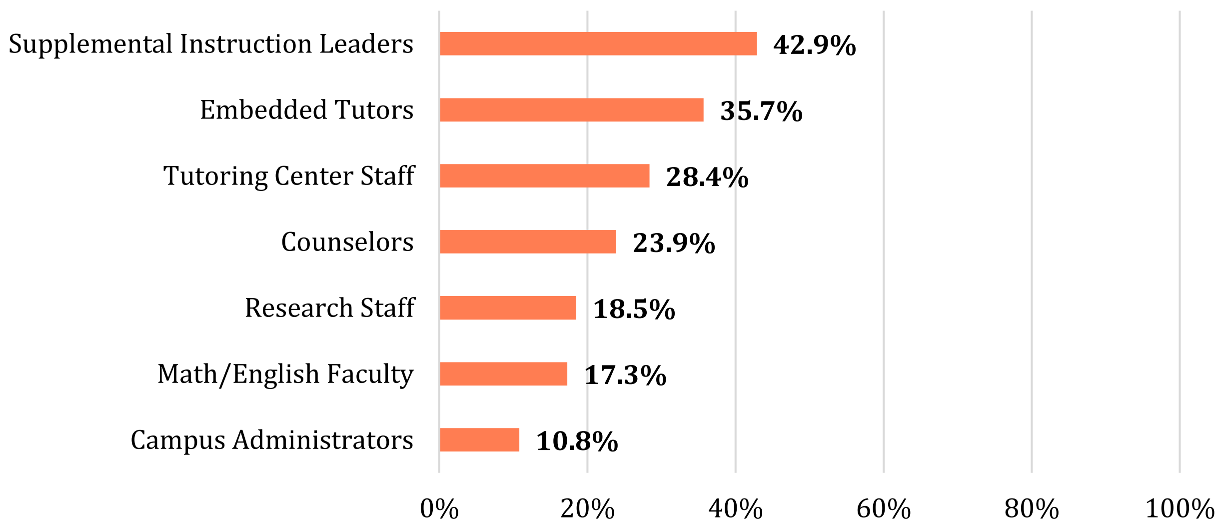
Our site visit colleges were sampled using our Scale of Implementation to maximize variation across levels of implementation, so that we could evaluate differences in institutional capacity. Resources, professional development, and equity approaches were explored during visits to each college.

Institutional capacity to implement AB 705 and 1705 varied between low and high implementer colleges. Although math and English faculty were the drivers of implementation, institutional capacity to implement was related to support provided by administration. In colleges identified as high implementers according to the Scale of Implementation, faculty reported a high level of support from administration, and experienced productive intradepartmental collaboration and support. Faculty also reported more agency in determining what professional development support they need, as well as how they would be compensated by the institution for working on reforms. In contrast, at low implementing colleges faculty felt persistent conflict and tension with administrators, a lack of intradepartmental collaboration and support, and agency. Given that high implementing colleges were associated with high levels of support from administration, institutional capacity seems to be determined at the institutional level with implications becoming visible at the departmental level (Burkander & Stenley, 2026).

Resources

Colleges leveraged various funding streams to support AB 705 and AB 1705 implementation. Most colleges reallocated categorical funds and used COVID recovery funds to support AB 705 implementation. Colleges invested in technology and curriculum tools such as new registration and placement systems, laptops and online tools, and expanded Open Educational Resource (OER) usage. Targeted use of AB 1705 funds and state funding streams was common in Year 4 (AY 2024-25) at institutions for initiatives such as embedded tutoring (n=3), course redesign (n=3), and additional student support roles (n=3). Although AB 1705 funds were used for additional student support staff, on our 2026 faculty survey, at least a fifth of faculty respondents reported insufficient supplemental instruction leaders, embedded tutors, tutoring center staff, and counselors to support implementation.

Figure 6. Percentage of faculty responding that there is “Nowhere Near Enough” of each position, 2026

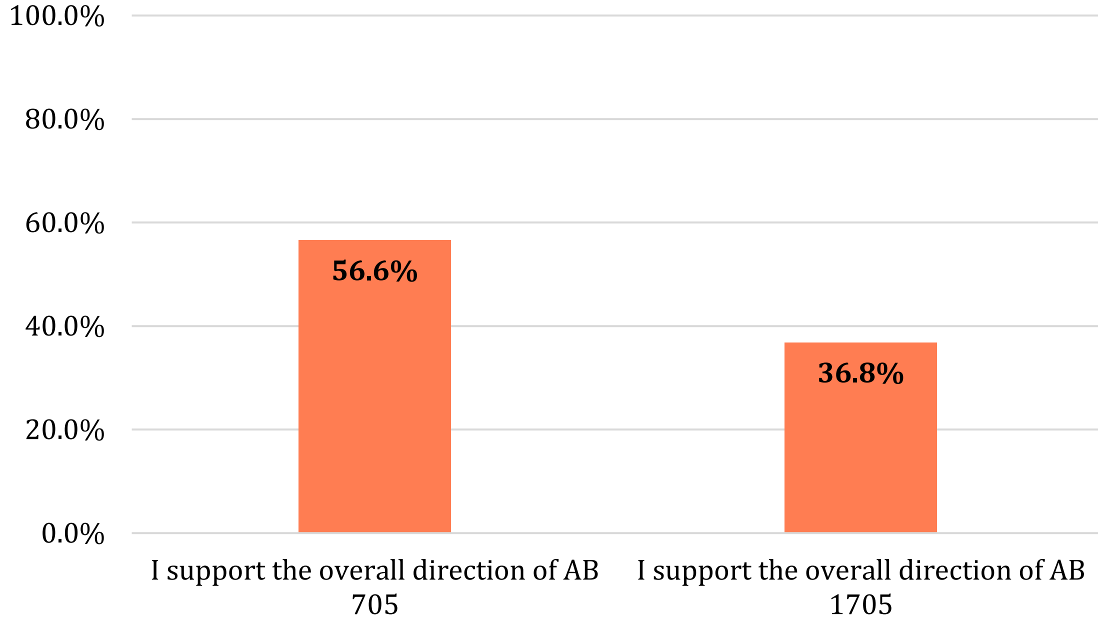


Note: Data represents responses from 75 faculty who completed the survey.

English and math faculty spearheaded institutional responses and implementation of AB 705 and AB 1705. College administrators had final decision-making authority but had a more limited role in making specific recommendations on college level policies and instructional changes. Administrators typically supported implementation by coordinating resources that faculty requested, and facilitating conversations among faculty leaders on structuring cocurricular supports and placement reform compliance. Counselors often had limited involvement in early conversations about the reforms, which in some cases hampered their ability to align with implementation approaches and provide adequate support to students.

Overall, levels of faculty support were mixed for both policies, but were stronger for AB 705 than AB 1705. Most site visit institutions (n=10) reported higher levels of support for AB 705 than 1705, and faculty reported similar sentiments on our 2026 survey, as shown in Figure 5. In 2024-25 site visits, faculty interview respondents commonly shared their perceptions of the benefits of removing multiple layers of developmental coursework, which may explain the higher levels of support for AB 705. In Year 2 of the study (AY 2022-23), counselor buy-in for AB 705 varied across colleges according to perceptions of faculty and administrators. Buy-in for AB 705 and 1705 differed among math and English faculty, as will be explained below.

Figure 7. Percentage of faculty responding that they "Agree" or "Strongly Agree" to each statement, 2026



Note: Data represents responses from 75 faculty who completed the survey.

Professional Development

Professional development to support faculty and staff in making changes to adapt to the new requirements of the reforms was voluntary and may not have reached all of those who could benefit. Although AB 705 was an unfunded mandate, internal professional development such as communities of practice and workshops were offered to math and English faculty at many colleges. With the passage of AB 1705 and the funding associated with that reform, most colleges offered professional learning opportunities for faculty (12 out of 15 in our 2024-25 site visit sample), and sometimes administrators, specifically to support their adoption of growth mindsets and equity-minded instructional practices. Further, a small number (4 colleges in our 2024-25 site visit sample) sponsored professional development for counselors in response to AB 1705 implementation. Because participation in professional development is commonly voluntary, administrators and faculty reported that these opportunities were often attended by those who already supported the reforms. They reported challenges in reaching additional faculty who might benefit, and limited uptake among those faculty, particularly related to equity training.

Institutionalizing Equity

Some colleges have embraced the equity principles of AB 705 and AB 1705 through shifting campus policy and practices, while others were slow to make change and/or found change to be challenging in their campus environments. Beginning in response to AB 705 and with additional funding associated with AB 1705, many colleges have institutionalized equity efforts through campus policies. At one college that defined what equity meant institution-wide, a respondent 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." Some colleges (N=8) had created institutional structures and leadership to support equity initiatives as of our 2024-25 site visits. Colleges have been exploring equity-minded instructional practices (Zamani-Gallaher, 2020) such as culturally responsive pedagogy in their math and English departments, although these shifts were more common among English faculty than math faculty (as discussed in more detail below). In addition to institutional policies and instructional support, some colleges implemented or expanded student support programs such as Mathematics, Engineering, Science Achievement (MESA)[6] and Puente, and enhanced their basic needs structures.

Comparing implementation in math and English departments

To address RQ3 (*How do policies and practices in math and English departments vary within colleges?)*, we consider how departments responded to the requirements associated with AB 705 and AB 1705, including their adoption of new placement approaches, elimination of developmental coursework, and instructional support strategies.

Placement policies

In many cases, placement testing had been eliminated prior to the passage of AB 705. None of the study colleges reported requiring placement testing to determine course placement. **In English, either official or self-reported high school GPA is the most common measure.** Incoming students typically only take introductory English courses, such as English 101 or English 1. Colleges most often use high school GPA to determine whether to recommend introductory English with or without support. **In math, high school coursework completed and/or grades in individual high school math courses are the most common placement measures.** Nearly all of the sample colleges reported using high school math courses completed and/or grades in specific high school courses to make recommendations for math placement. Colleges frequently make placement recommendations to students based on the last math class the student passed in high school, as self-reported on the guided placement survey. High school GPA, whether based on the official transcript or self-reported, as well as guided self-placement, are also used for placement recommendations in more than half of sample colleges.

Nearly all study colleges adopted the default placement guidelines outlined by the Chancellor's Office. The California Community Colleges Chancellor's Office recommended that students who graduated from high school within the past 10 years and have a goal of transfer or degree attainment be recommended to enroll directly into transfer-level courses based on a set of guidelines. While community colleges were not required to use these guidelines, those who chose not to were required to submit local data showing that their placement process was maximizing throughput for degree, certificate, and transfer students, which proved a deterrent in some cases.

Most sample colleges did not require students to enroll in a course section with cocurricular support but instead only provided recommendations based on the placement process, leaving students wide latitude on the course enrollments. Although students typically met with a counselor to determine their first semester courses, they were not required to register for the courses with support that were recommended. Two of the study colleges were exceptions to this trend: in the first, both the English and math departments required students to enroll in a corequisite section if their high school GPA was below a specific threshold, while in the second, the college decided to require students to enroll in a corequisite course if they fell into the middle placement band in English; students had to complete a form to "opt out" of the support course.

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[6] MESA is a program established in 1991 to support underserved and underrepresented community college students pursuing STEM fields: https://www.cccco.edu/About-Us/Chancellors-Office/Divisions/Educational-Services-and-Support/What-we-do/Curriculum-and-Instruction-Unit/Mathematics-Engineering-Science-Achievement

Elimination of below-transfer-level coursework

Most, but not all, institutions in our sample (9 of 13) eliminated below transfer-level math and English courses by spring 2023; all site visit colleges had eliminated these courses by spring 2026. Among these colleges, most had gradually eliminated below-transfer level courses over time. Colleges retaining below-transfer offerings often reported that they offered these options for students in the interest of being student-centered. Trends in the status of below-transfer level courses across sites included in the sample should be understood in the context of content areas.

English and Math departments have followed different pathways towards the dissolution of below-transfer level courses. English departments tended to engage in the process of accelerating their below-transfer level courses and eliminating them earlier than math departments. One sample college maintained a section of below-transfer level English designated for English language learners and students with disabilities, but English departments were typically able to discontinue these below-transfer level courses. The process in math departments was often more complicated, due to multiple math pathways and prerequisites for other STEM programs. For instance, three of the sample institutions required below-transfer level math courses as prerequisites for subjects such as Chemistry and Nursing. One sample college maintained a section of below-transfer level English designated for English language learners and students with disabilities.

Equity-Minded Instructional Support Strategies

As mentioned above, in response to the changing needs of students in introductory, transfer-level courses, faculty were also implementing many equity-minded instructional strategies (Zamani-Gallaher, 2020) to support student success, both in standalone courses and those with concurrent support. While strategies were more frequently used in English than in math, overall, the findings suggest a commitment among faculty to applying instructional practices that foster inclusion, responsiveness, and formative feedback, with ongoing opportunities to increase adoption across math departments.

Figures 8 and 9 below display the frequency with which English and math faculty in sample community colleges who completed the faculty surveys use common instructional support strategies in the classroom.

Figure 8. Instructional support strategy usage frequency according to faculty survey respondents in introductory, transfer-level math courses

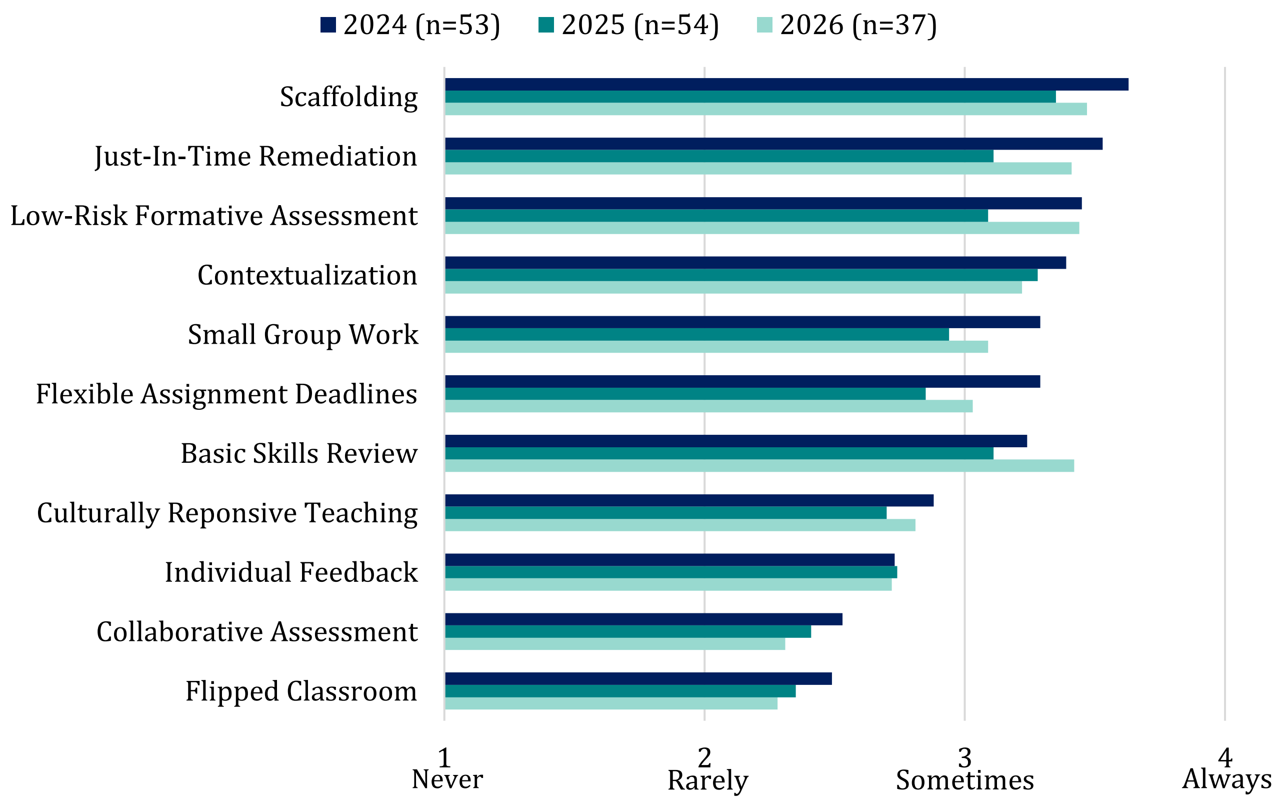
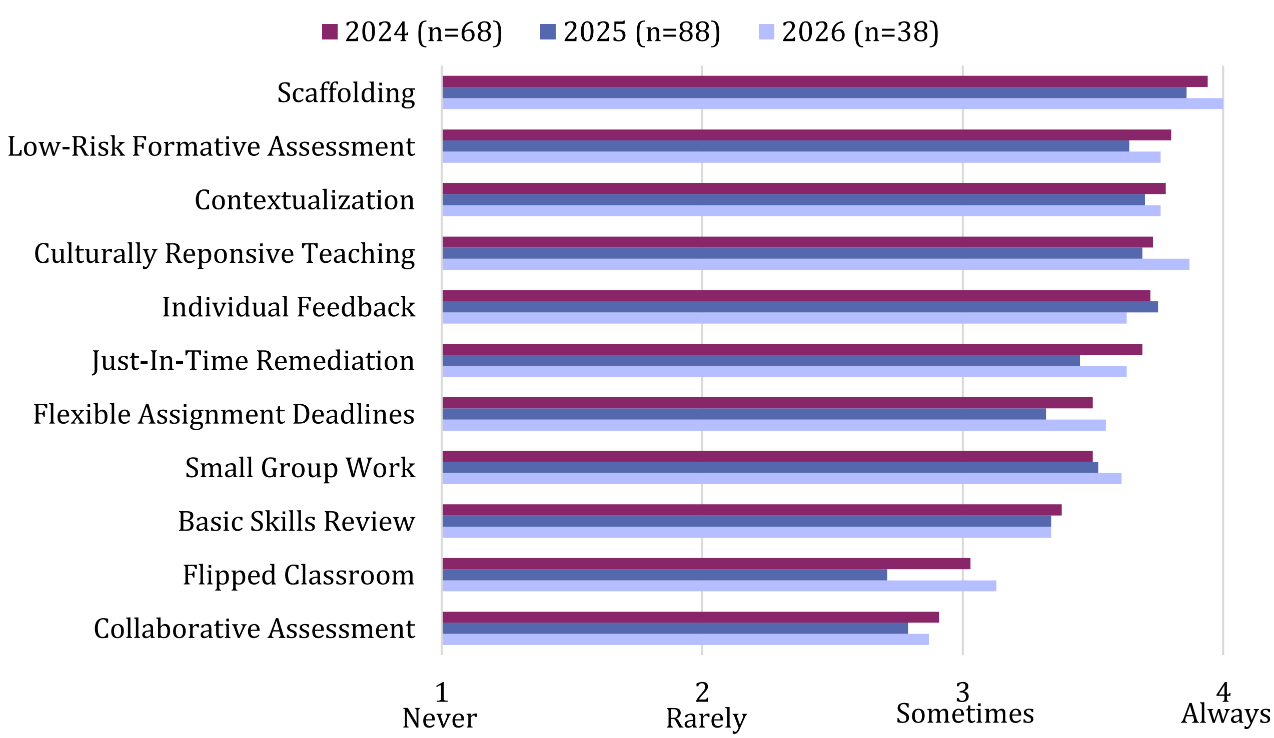


Figure 9. Instructional support strategy usage frequency according to faculty survey respondents in introductory, transfer-level English courses



Five instructional support strategies were frequently implemented across both English and math faculty, with faculty indicating that they used these strategies "sometimes" or "always"**.** As shown in Figures 8 and 9, while English faculty reported utilizing all but two of the strategies frequently (i.e., flipped classroom and collaborative assessment), both math and English faculty implemented scaffolding, contextualization, just-in-time remediation, low-risk formative assessments, and basic skills review frequently.

Perceptions of the effectiveness of instructional support strategies varied between the math and English departments. Figures 10 and 11 indicate 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 consistent differences between department faculty as well.

Figure 10. Percent of math faculty reporting that strategies are "very" or "extremely" effective

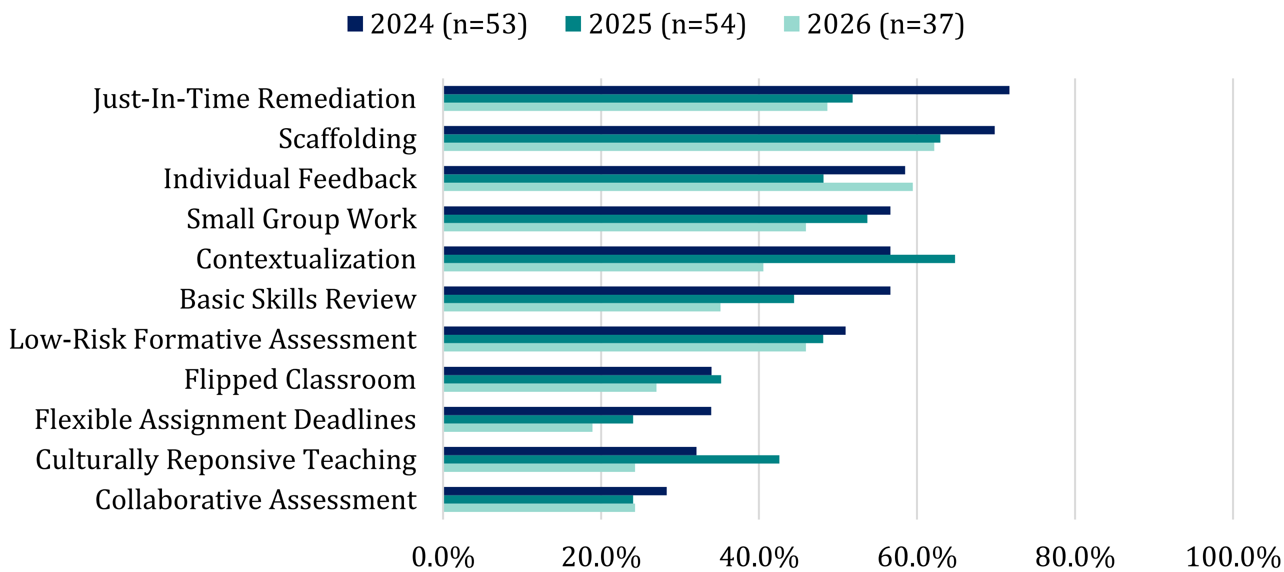
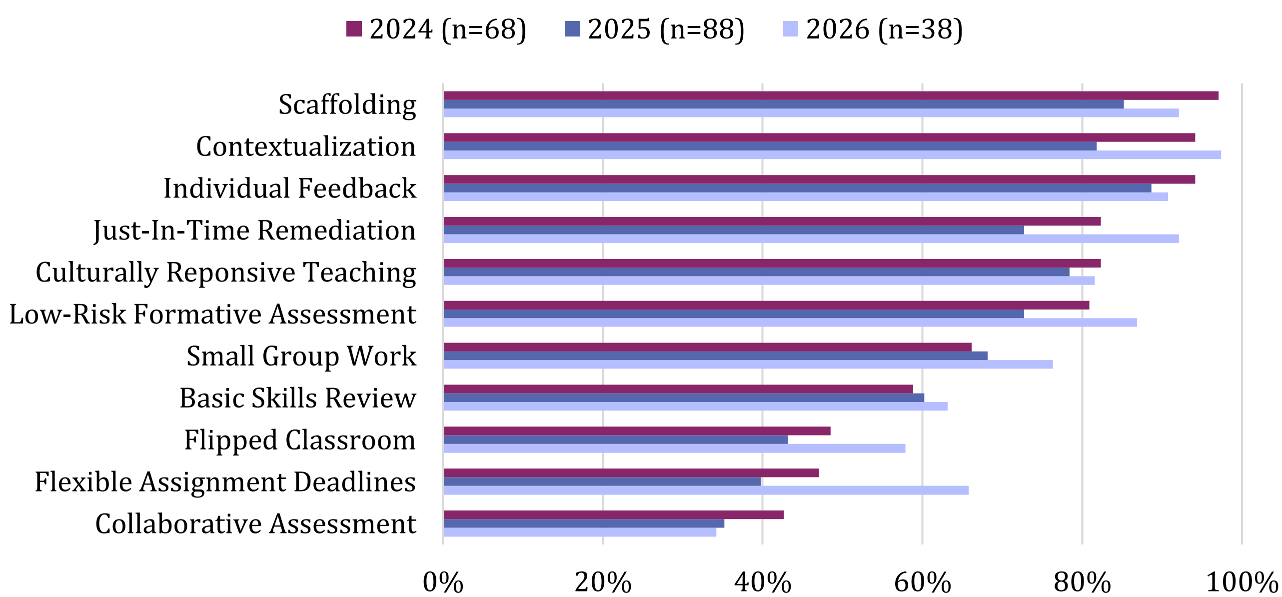


Figure 11. Percent of English faculty reporting that strategies are "very" or "extremely" effective



Regardless of department, scaffolding, individual feedback, and just-in-time remediation were identified by most faculty as very or extremely effective practices. While the percentage of faculty reporting these strategies to be very or extremely effective varied across years, each was consistently identified as highly effective. In focus group discussions across sites, students similarly 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 less likely to be perceived as effective. Collaborative assessment received the lowest endorsement from math and English faculty as an effective strategy across years. Few faculty also reported that flipped classrooms and flexible deadlines were highly 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.

Comparing faculty buy-in and mindsets between math and English departments

Lastly, in response to RQ4 (*How does faculty buy-in vary between math and English departments? Why?*), we highlight findings from our interviews as well as our faculty survey. While both math and English departments were subject to reforms associated with AB 705 and 1705, **English faculty were generally more supportive of the changes than math faculty**. This is likely due to some of the ways in which the reforms were experienced differently, such as:

- Faculty engagement in pre-reform momentum;
- Implementation of AB 705 placement reforms;
- Staffing implications of AB 705 reforms;
- Faculty experience of AB 705; and
- Faculty experience of AB 1705.

English faculty may have been more engaged in pre-reform momentum than math faculty. In 2010, years before AB 705 became law, the California Acceleration Project (CAP) began offering workshops for faculty, presenting professional development on the harmful effects of developmental education and providing training on just-in-time remediation and acceleration practices, where colleges were encouraged to consolidate their extensive developmental sequences. Faculty at several of our site visit colleges had participated in these optional workshops in the years before AB 705 was passed. This engagement was typically initiated by English department leaders, who brought their faculty to conferences; many of these faculty became trained in CAP practices and in some cases presented as workshop leaders.

In a few cases, we heard that both math and English faculty had participated in CAP workshops prior to the reform. This early engagement helped to build skills in new pedagogy and helped departments feel prepared for the coming change. In contrast, faculty and administrators who had not engaged in this work, disproportionately those in math departments, expressed surprise and frustration with the content and accelerated pace of the reform.

In our site visits, we heard that while both math and English departments were subject to AB 705 reforms, implementation was more complex in math departments. In English departments, the primary task was eliminating below-transfer-level course options and placing all students directly into transfer-level English Composition. This typically meant shuttering the Reading and Writing departments whose primary course offerings were developmental, and shifting faculty from those departments into English departments. Most English departments created corequisites for English Composition, and many utilized the embedded tutoring model in those courses.

In math, however, the complexity of multiple pathways (i.e., SLAM and STEM) made implementation more challenging. Math departments were charged with eliminating below-transfer-level math coursework in both pathways, but additional work was typically required to provide adequate pathway support for students.

Math departments commonly determined that Statistics would now be the primary SLAM math course offered, which required significant shifts, as many math departments had limited Statistics offerings in the pre-reform period. As these departments reduced below-transfer-level course options, many part-time faculty positions were eliminated, and full-time faculty were charged with teaching more introductory courses. We heard from many math faculty that they were teaching Statistics for the first time:

> *I was mainly teaching college algebra, trigonometry, intermediate algebra, calculus, but since AB 705, it's just mostly statistics now.*

Many colleges also decided to create new transferable SLAM math course options for students and had to ensure that they met articulation agreements with California State University (CSU) and University of California (UC) schools.

On the STEM side, faculty worked to eliminate below-transfer-level courses such as Intermediate Algebra, which had enrolled large numbers of students in the pre-reform period. Many faculty described that course as their "bread and butter." STEM departments typically responded to AB 705 by creating corequisite courses to support their College Algebra, Trigonometry, and Precalculus courses, and many invested in the embedded tutor model.

English and math departments in the site visit sample experienced different staffing implications as a result of AB 705 reforms. As noted above, Reading and Writing departments were typically eliminated post-AB 705. If faculty in those department had the qualifications to teach English Composition, they were often absorbed by English departments, but others had to reskill or leave the college. One respondent explained that:

> *All of us Reading teachers, we put our heart and soul into that Reading program and we really believed in it. We saw how much it was benefitting students. So when we had to dismantle [it], it was very emotional. I was resentful.*

These DE faculty had been using many of the pedagogical approaches recommended in the reforms (e.g., scaffolding), so English departments integrating these faculty benefited from having these experienced individuals joining their ranks; these faculty could support others in adopting these instructional practices. Many of these formerly-DE faculty were now teaching the corequisite-paired English Composition courses.

In contrast, most DE math courses had been taught by part-time faculty, whose positions were eliminated in the reform. Full-time math faculty were now expected to teach these introductory courses to students with a broader range of skills. This created conflict in some departments, with full-time faculty resisting the change. In response, some math departments assigned those courses to part-time faculty. In other cases, full-time faculty resigned or retired, creating an opportunity to replace those faculty with “new blood, new thinking, and an interest in doing things differently.”

Math and English faculty expressed different perceptions of the effectiveness of these reforms, based on their experiences of the students in their courses. We heard in site visits, that while English faculty generally observed students being successful in their courses, math faculty experienced persistent struggles. Math faculty perspectives often differed between STEM and SLAM pathways, with SLAM faculty experiencing more success in their courses than STEM faculty.

This difference is partly due to the fact that SLAM math courses are typically terminal, with no subsequent coursework required to satisfy the requirement. This means that faculty can focus on supporting their students to pass the course without worrying about how their skill levels may impact their success in future coursework. In contrast, STEM faculty felt responsible for preparing their students to be successful in subsequent STEM math courses, as well as courses in other disciplines such as science and business. These faculty expressed concern about students who entered with inadequate skills and struggled to provide sufficient support while covering all of the course content. Instructors commonly shared that even with the additional time of a corequisite course, it was not sufficient to remediate the skills of many of their students, and many were failing their courses. These faculty commonly described this increase in failing grades as “demoralizing”.

We also observed differences between math and English faculty in terms of instructional strategies and their perceptions of professional development. Whereas English faculty often readily adopted equity-minded practices and perceived internal and external professional development opportunities as helpful, we often heard that math faculty questioned the value of these strategies and commonly described professional development opportunities as “insulting”, “irrelevant”, or “inapplicable”. One math faculty member explained that:

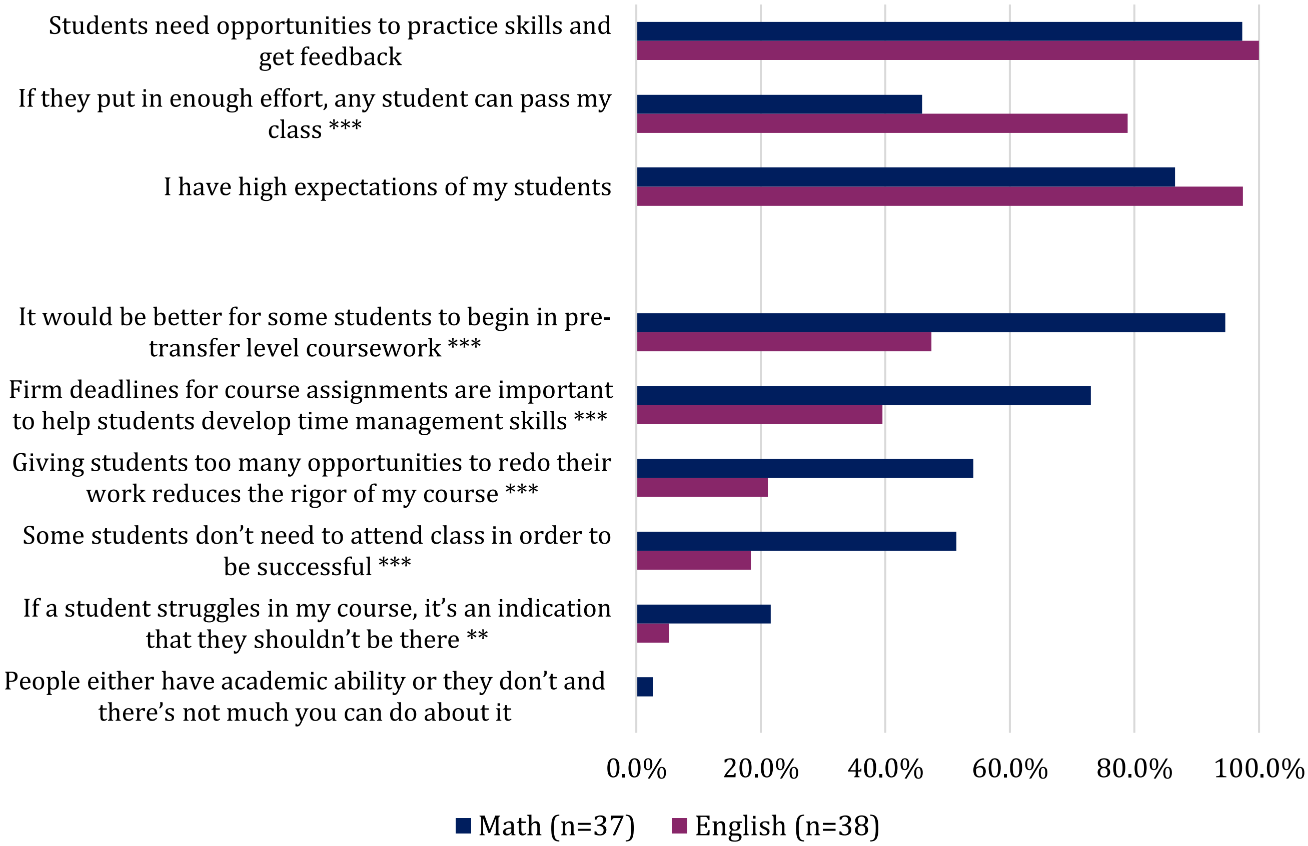
> *There's some professional development and stuff we’re like, ‘Well that doesn't quite apply’… It's a little challenging to find things that are applicable to ‘Where's the magic formula to get my students who are two levels below [transfer-level] closer [to transfer-level]?’*

Compounding this challenge, **many STEM math faculty shared that their administration has been critical of their lack of success under the reform**. Some faculty suggested that they felt pressure to reduce the rigor of their courses to improve success rates, which they strongly objected to, believing that it would not ultimately support students in their future courses.

Math and English departmental faculty commonly experienced AB 1705 differently. In our conversations with faculty in math and English departments, we commonly heard the perception from English faculty that AB 1705 did not require any additional work from their departments. In contrast, math faculty expressed shock and outrage about the proposed reduction in preparatory courses before Calculus, indicating that this would have dire consequences for students. These faculty suggested that while the goal of the reform was to help more students access and complete STEM math, it may ultimately reduce the number of students entering STEM fields and may have disproportionately negative impacts on students of color whose equitable outcomes it was designed to improve.

English faculty were more likely to exhibit growth mindset than math faculty. In the most recent survey administration in 2026, we saw significant differences between math and English faculty in their agreement with nearly all statements on growth and deficit mindset, as shown in Figure 12 below.

Figure 12. Percent of faculty reporting that they "Agree" or "Strongly Agree" with each growth mindset statement by subject taught, 2026



Note: Table displays results of the 2026 administration of the survey only. Significant differences in responses to each question from math and English faculty were measured using t-tests. Statistical significance is denoted with stars: **p<0.05, ***p<0.01.

As seen in Figure 12, English faculty were more likely to express agreement with statements supporting a growth mindset, and math faculty were more likely to agree with statements supporting a deficit mindset. While many math and English departments noted making changes to instructional strategies, our research suggests that without changes in faculty mindset institutional efforts to improve student outcomes will have limited impact (Burkander & Duffy, 2026).

Implementation Study Summary

Collectively, these data help us understand how institutions responded to AB 705 and 1705 reforms across the system, how institutional capacity informed implementation at our site visit colleges, and how math and English departments differed in their experiences and support for these reforms.

Overall, we observe that colleges have transformed math and English pathways to increase access to transfer-level coursework and reduce their below-transfer level course offerings. However, while the laws encouraged institutions to develop cocurricular supports to promote success in these courses, these supports (e.g., corequisites, embedded tutors) were not required, and over the course of the study we have observed a decline in their availability to students. Concurrently, we have observed that many faculty have adopted equity-minded instructional strategies aimed to provide academic support to marginalized students, in both standalone and cocurricular-supported course sections. Our interview and survey data suggest that support for and implementation of these strategies is more common among English faculty than math faculty, which may be related to the persistence of equity gaps that we observe in student success, discussed in the Impact section that follows.

Our Scale of Implementation measures offer a broad view of how these reforms have changed course offerings at colleges throughout the state. When we take all four indicators of implementation together, we see that overall, most colleges improved on the Scale over the course of the study. However, we do observe that some institutions that started higher on the Scale have lower rankings by the end of the study; we believe that this is driven by a decline in the number of introductory transfer-level courses were being offered with cocurricular support (Indicator 2). As described in detail above, many colleges continued to iterate on their approaches to offering cocurricular support (e.g., corequisites, enhanced courses) during the study, with many reducing the number of corequisite-paired courses offered. In our 2026 spreadsheet data, at least two-thirds of introductory-level course sections in English (67%) and math (76%) did not offer any cocurricular supports. We enumerate some of the challenges with these models above, including declining faculty support. When we focus just on the change in percent of introductory courses offered at transfer-level (Indicator 1), we see that all but one institution was ranked as a high implementer by the end of the study period. This provides clear evidence that AB 705 and 1705 reforms have led to dramatic improvements in the availability of transfer-level coursework for all students, a key target of the reform.

Recognizing that institutional capacity can help shape implementation of statewide reforms (Hu et al., 2015), we consider the financial, technological, curricular, and/or human resources mobilized to respond to AB 705 and 1705. Our research indicates that institutional rankings on our Scale of Implementation helped to explain some of the variation we observed in institutional capacity, with faculty reporting higher levels of autonomy and support from administrators at high implementer colleges, which facilitated implementation. Faculty at low implementer colleges reported higher levels of tension and less intradepartmental collaboration, which hampered their institutional response. While colleges received funds to support the implementation of AB 1705, faculty still commonly reported that staffing levels were inadequate, particularly with respect to embedded tutors, research staff, and counselors. Given the equity impetus for AB 705 and 1705, many institutions leveraged funds to support professional development and other campus practices to promote equitable outcomes for all students, although optional professional development may not be reaching all who might benefit.

Lastly, we examine how math and English departments experienced these reforms. Most math and English departments adopted the default placement rules provided by the CCCCO, and most eliminated pre-transfer level math and English by spring 2023. However, we see significant differences between departments when considering their implementation of instructional support strategies, buy-in for the reforms, and mindsets. While both departments were subject to AB 705 and 1705 requirements, the complexity of math pathways made implementation more challenging. We detail above some of the ways in which the burden of these reforms fell more heavily on math departments, with many math faculty reporting that their departments were struggling with implementation and buy-in. English faculty had typically engaged earlier in reform activities, and were able to acquire Reading and Writing faculty with more experience teaching diverse skill levels. Math faculty commonly reported that covering the content in their courses was more difficult in the post-reform period, and saw more student failure. Math faculty also frequently reported that their administrators were critical of their low success rates, which further decreased morale. These contrasts help to illustrate how professional development and administrative support, aspects of institutional capacity, can support departments in implementing DE reforms.

Impact Study

Our impact study utilized two different quasi-experimental methods to understand the impact of the reforms on student outcomes. These analyses address the following research questions:

- RQ5. 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?
- RQ6: What is the overall impact of the AB 705 policy on student outcomes (e.g., transfer-level math passing rate in the first year)?
    - RQ6a: Does the effect of AB 705 vary across students with high, middle, and low high school achievement?
    - RQ6b: Does the overall policy effect vary across different socio-demographic student groups?

This section of the report will answer each of these research questions in order, highlighting key findings from the individual analyses.

Data Sources

We used multiple administrative data sources to construct analytic samples for both analyses. Our core dataset came from the California Community Colleges Chancellor's Office Management Information System (COMIS), which includes information about college enrollment, demographic characteristics, course-taking, and degree outcomes. We supplemented with two additional sources: (a) CCCApply, which provides self-reported high school GPAs from college applications; and (b) the California Department of Education (CDE), which has data about high school course enrollment records and California Assessment of Student Performance and Progress (CAASPP) and California Longitudinal Pupil Achievement Data System (CALPADS) test scores. We also used student identifiers—Social Security numbers, names, and birthdates—available in the CDE dataset to link the CDE and COMIS data, thereby generating an anonymized, integrated dataset for analysis.

IPWRA analysis

To examine which student characteristics predicted enrollment in transfer-level math and English courses during the early roll out of the policy and estimate the relationship between transfer-level course enrollment and subsequent student outcomes (RQ5), we applied an inverse probability weighted regression adjustment (IPWRA) approach using the first cohort after the policy passed. We addressed the following sub-questions:

RQ5a: Which student characteristics predicted enrollment in transfer-level math and English courses during their first semester of college?

RQ5b: What are the associations between transfer-level course enrollment and short- and longer-term outcomes—including course success, degree attainment, and vertical transfer?

To address these RQs using IPWRA, we focused on the transition cohort (fall 2018), when colleges varied substantially in their placement practices and continued to offer both transfer-level and below-transfer-level courses. This allowed us to examine which student characteristics predicted enrollment in transfer-level math and English courses during students' first semester of college (RQ5a), at a time when students could feasibly be placed in either developmental or transfer-level coursework. We used descriptive statistics and logistic regression models to estimate how student academic preparation and demographic characteristics predicted first-term enrollment in transfer-level coursework. Then we adjusted for the observable differences between students who enrolled in transfer-level courses and those who did not using IPWRA—outcome regression models that use the propensity scores from the prior stage (the logistic regressions estimating the probability of student enrollment in transfer-level math or English) as regression weights. This approach allows us to estimate the association between transfer-level enrollment and outcomes while accounting for observed differences in student characteristics. Although we do not directly observe institutional placement decisions, we account for institutional context by including college fixed effects and defining students' primary institution based on their first-term enrollment patterns.

Sample

The IPWRA analysis centers on the Fall 2018 cohort of first-time community college students (see Appendix B). During this AB705 roll-out year, many colleges expanded access to transfer-level courses while continuing to offer below-transfer-level courses. This natural variation allowed us to construct meaningful comparison groups of students enrolled in different course levels at the same institution. The 2018 cohort offers an analytical window for examining patterns of access and outcomes when the reform was not yet at scale.

We restricted the sample to students who enrolled in at least one math or English course in Fall 2018 and had valid academic preparation data including either transcript-based measures or self-reported high school GPA. Using these criteria, we constructed three overlapping analytic samples: students with CDE records (transcripts and test scores), students with CCCApply self-reported GPA, and students with both data sources. Our analysis relies on the CDE sample because it includes verified academic records.

For analytic purposes, we constructed separate but overlapping subject-specific analytic samples for math and English. The math analytic sample includes first-time community college students who enrolled in at least one math course in Fall 2018 and met the data availability and common support criteria. The English analytic sample is defined similarly for students who enrolled in at least one English course during the same term. Because many students enrolled in both math and English in their first semester, the two analytic samples partially overlap.

Variables

Treatment and Outcome Measures for IPWRA Analysis

For the math and English analytic samples, we created a treatment indicator that captures whether the highest course in each subject was transfer-level or below-transfer-level. This indicator served as the dependent variable in the selection (propensity score) models and as the primary independent variable of interest in the outcome models. To create the transfer-level course enrollment indicator, we used course enrollment records to classify initial math (or English) courses as transfer-level (i.e., transferable to UC and/or CSU systems) or below-transfer-level (i.e., nontransferable). Among students in the math sample, 40% enrolled in transfer-level math in their first term, whereas 60% enrolled only in below-transfer-level math. In the English sample, 70% enrolled in transfer-level English, and 30% enrolled only in below-transfer English.

To examine the relationship between initial transfer-level course enrollment and later academic progress, we constructed **nine outcome measures** capturing short-term (one-year) and longer-term (five-year) milestones. These outcomes include passing at least one transfer-level course, total below-transfer-level credits attempted, total transfer-level credits attempted, and total transfer-level credits earned. We also examine broader indicators of academic progress, including cumulative college GPA, completion of a community college credential (certificate or associate degree), and transfer to a four-year institution.

Baseline Covariates

The IPWRA models include a set of baseline demographic, socioeconomic, and academic preparation measures. These include race and ethnicity (Black, Hispanic/Latine, Asian, White, and other), gender, age at entry, first-year Pell Grant receipt, principal educational goal at entry, and highest parental education level. In addition to the state assessment scores from CDE data, the IPWRA also incorporates the highest-level high school course taken in each subject (ranging from Tier 1 to Tier 4), and the grade earned in that course. The IPWRA models use the same baseline covariates in the propensity score estimation but additionally include early college performance measures in the outcome models—specifically first-semester full-time enrollment status, first-semester college GPA, and credits attempted during the first semester—to account for differences in early academic momentum that may influence subsequent outcomes.

IPWRA Analysis

To understand which students were more likely to enroll in transfer-level math or English courses in their first semester (RQ5a), we used descriptive statistics and logistic regression models. We modeled the probability of enrolling in a transfer-level course (which we refer to as the selection model), separately for math and English, for student *i* at college *c* as follows:

$$Logit(p_{ic}) = ln(\frac{p_{ic}}{1 - p_{ic}}) = \beta_0 + \sum_{n=1}^{N} \beta_n X_{nic} + \lambda_c + \varepsilon_{ic}$$

where p_{ic} is the probability of enrolling in a transfer-level course (as opposed to enrolling only in below-transfer-level); β_0 is the intercept; $X_{1ic}, \ldots, X_{Nic}$ are covariates representing student demographic and pre-college academic measures; $\beta_1, \ldots, \beta_N$ are regression coefficients; λ_c is college fixed effects; and ε_{ic} is the residual term. To address variability in transfer-level course offering and experiences across colleges, we included college fixed effects based on each student's primary institution, which we operationalized as the college where the student attempted the most credits in the first term.

For RQ5b, which examines the associations between first-semester transfer-level course enrollment and student outcomes, we used IPWRA. The logit regression models described above were used to estimate the probability of transfer-level course enrollment in math and English for every student in each of the corresponding samples. These predicted probabilities were then used to calculate inverse probability weights (W_{ic}) to balance differences between students who enrolled in a transfer-level math (or English) course—the treatment group—and those who enrolled only in a below-transfer-level math (or English) course—the control group. We then estimated weighted linear regressions—which we refer to as the outcome model—to predict treatment-specific outcomes for each student, separately by treatment condition (treated versus control), subject (transfer-level math versus English), and outcome.

The outcome regression model was specified as:

$$Y_{ict} = \beta_{0t} + \sum_{n=1}^{N} \beta_t X_{ict} + \lambda_c + \varepsilon_{ict}, \text{with weights } W_{ic} = \begin{cases} \dfrac{1}{p(T_{ic} = 1|X_{ic})}, if\ T_{ic} = 1 \\ \dfrac{1}{1 - P(T_{ic} = 1|X_{ic})}, if\ T_{ic} = 0 \end{cases}$$

where, for each student i in college c under treatment condition t, Y_{ict} represents the outcome of interest, T_{ic} indicates their treatment status ($T_{ic} = 1$ if enrolled in a transfer-level course), X_{ict} denotes covariates, and λ_c represents college fixed effects implemented as a full set of college indicator (dummy) variables. Students were weighted by the inverse of their predicted probability of transfer-level course enrollment. The model included covariates from the propensity score model that did not meet baseline equivalence but were acceptable under What Works Clearinghouse [WWC] (2022) standards, including one covariate slightly exceeding the WWC equivalence threshold. We also added college-level variables—such as first-semester full-time status, GPA, and credits attempted—to control for early academic performance and included college fixed effects to account for institutional differences. The average treatment effect (ATE) was computed as the mean difference in predicted outcomes under each condition. We assessed covariate balance using standardized mean differences (SMDs); results showed substantial improvement after weighting (Tables B1 and B2 in Appendix B).

IPWRA Analyses Results

Predictors of Transfer-Level Course Enrollment (RQ5a)

Table B1 in Appendix B presents results from logistic regression models predicting enrollment in transfer-level math and English courses, estimated separately by subject. For ease of interpretation, we report average marginal effects (AMEs), which represent changes in the probability of enrolling in a transfer-level course associated with a one-unit change in a given variable, holding other variables constant. Given our large sample sizes and high statistical power, we adopted conservative thresholds for statistical significance ($p < .01$, .001, and .0001) to reduce the risk of overstating small differences and better reflect variation in statistical strength. This decision is consistent with guidance suggesting that conventional thresholds may overstate significance when sample sizes are large (e.g., Benjamin et al., 2017; Lin et al., 2013; Wasserstein & Lazar, 2016).

Demographic characteristics such as gender, race/ethnicity, and Pell Grant recipient status significantly predicted transfer-level enrollment in the first semester, with variation by subject. For example, identifying as a woman (compared to a man) was associated with a 3-percentage-point higher probability of enrolling in transfer-level math ($AME = .030$, $SE = .006$, $p < .0001$) vs below-transfer math. In English, identifying as Black, Hispanic/Latine, or "other race" (relative to White) predicted lower probabilities of transfer-level enrollment, with Hispanic/Latine students showing the largest negative association. Pell Grant receipt was negatively associated with English enrollment but not math. Parental education was positively associated with enrollment. Students' academic backgrounds were also important predictors. In math, each higher tier of high school course enrollment was associated with greater probability of transfer-level enrollment, while course tier was not significant for English. However, the grade earned in the highest-level high school course predicted transfer-level enrollment in both subjects. Higher CAASPP scores also positively predicted enrollment. Students with goals other than transferring to a university—including personal development, earning a community college degree, or undecided/unknown goals—were less likely to enroll in transfer-level courses.

Transfer-Level Math & English Course Enrollment and Student Outcomes (RQ5b)

We now turn to RQ5b, which examines associations between first-term transfer-level course enrollment and student outcomes using IPWRA models. We report ATEs for transfer-level enrollment with robust standard errors and apply conservative significance thresholds ($p < .01$, .001, and .0001).

Table B2 in Appendix B presents IPWRA estimates for the math sample, with unadjusted results included for comparison. We focus on the weighted models (third and fifth columns), which better adjust for potential confounding. **First-term transfer-level math enrollment was strongly associated with both short- and long-term outcomes**. Within 1 year, taking transfer-level math—compared with below-transfer-level—was associated with a 36-percentage-point increase in the probability of passing transfer-level math ($ATE = .357$, $SE = .018$, $p < .0001$), alongside improved math progress and reduced below-transfer-level credits. By year five, initial enrollment in transfer-level math, instead of below-transfer, was correlated with an average increase of 4.5 transfer-level credits and a decrease of 6.5 below-transfer-level credits ($ATE = 4.467$, $SE = .228$, $p < .0001$; $ATE = -6.484$, $SE = .134$, $p < .0001$).

Beyond course-specific outcomes, we observe moderate differences in broader academic progress and transfer outcomes. Transfer-level math enrollment was associated with higher GPAs at both 1 and 5 years. Although no association emerged for credential attainment in the first year, by year five it was associated with a 3.7-percentage-point increase in certificate attainment and a 6.4-percentage-point increase in associate degree attainment (ATE = .037, $SE = .011$, $p = .0001$; $ATE = .064$, $SE = .011$, $p < .0001$). It was also positively associated with vertical transfer, with increases of 0.8 percentage points in year one and 8.4 percentage points in year five ($ATE = .008$, $SE = .003$, $p = .008$; $ATE = .084$, $SE = .013$, $p < .0001$).

Table B3 in Appendix B presents IPWRA results for the English sample. As with math, we focus on weighted estimates while also reporting unadjusted results**. Course-specific patterns for English were similar to those in math.** Transfer-level English enrollment significantly predicted passing a transfer-level English course within 1 year, and this advantage persisted through year five. Students in transfer-level English attempted nearly three more transfer-level credits and earned two more credits in the first year than those in below-transfer-level courses (ATE = 2.920, SE = .076, $p < .0001$; ATE = 2.075, SE = .061, $p < .0001$). Although gains in cumulative credits continued over time, the magnitude of the gap narrowed: By year five, the difference in credits attempted declined to 1.8, and the gap in credits earned decreased to 1.4 credits (ATE = 1.821, SE = .133, $p < .0001$; ATE = 1.361, SE = .082, $p < .0001$). In addition, transfer-level English enrollment was associated with attempting fewer below-transfer-level credits.

Academic progress outcomes for transfer-level English enrollment, such as GPA, credential attainment, and vertical transfer, also showed positive associations in both the short and the long term. First-year and five-year GPAs were 0.1 and 0.17 points higher, respectively, for transfer-level English students (ATE = .101, SE = .020, $p < .0001$; ATE = .166, SE = .029, $p < .0001$). Taking transfer-level English was positively associated with credential attainment, particularly in the long term. For example, enrolling in transfer-level English predicted a 4.2-percentage-point increase in the probability of certificate attainment and an 8.5-percentage-point increase in the probability of associate degree attainment within 5 years (ATE = .042, SE = .011, $p < .0001$; ATE = .085, SE = .013, $p < .0001$). Transfer-level English enrollment was also associated with a higher probability of university transfer in the long term than was enrollment in below-transfer-level courses.

Interrupted Time Series analysis

We utilize an interrupted time series (ITS) analysis to address the other impact study research questions:

- RQ6: What is the overall impact of the AB 705 policy on student outcomes (e.g., transfer-level math passing rate in the first year)?
    - RQ6a: Does the effect of AB 705 vary across students with high, middle, and low high school achievement?
    - RQ6b: Does the overall policy effect vary across different socio-demographic student groups?

Sample

We initially constructed a sample of eleven first-time-in-college (FTIC) student cohorts who entered California public community colleges between fall 2014 and fall 2024. This sample includes four pre-AB 705 cohorts (fall 2014–2017), one rollout cohort (fall 2018), and six post-AB 705 cohorts (fall 2019–2024). 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 C1 in Appendix C presents the number of FTIC students included in the initial sample.

A key concern in single group interrupted time series designs is that cohort level compositional changes may confound estimates of policy effects (Bloom, 2003). Because AB 705 restructured placement practices based on measures of prior academic preparation, it is essential to account for baseline differences in high school achievement across cohorts. To address this issue, we merged 11th grade math and ELA assessment records from CALPADS with the initial FTIC sample. The ITS analytic sample is therefore restricted to FTIC students who (1) graduated from a California public high school and (2) had valid 11th grade math and ELA assessment scores.

Because statewide 11th grade assessments were not administered in 2014, 2020, and 2021, more than 90% of students in the 2015, 2021, and 2022 FTIC entry cohorts lack valid baseline assessment scores. Due to this, we exclude these cohorts from the ITS analytic sample to maintain a consistent and comparable measure of baseline academic preparation across cohorts. As a result, the final ITS analytic sample includes eight FTIC entry cohorts: 2014, 2016, 2017, 2018, 2019, 2020, 2023, and 2024. Across these cohorts, between approximately 49 percent and 66 percent of FTIC students are retained in the analytic sample. Table C2 in Appendix C reports the number of FTIC students included in the ITS analytic sample by cohort.

Variables

Treatment and Outcome Measures for ITS Analysis

We examine enrollment in and successful completion of transfer-level math and English courses within one and two academic years of initial college entry. For each cohort, the first academic year includes the fall term of entry, winter intersession, spring term, and the subsequent summer term. The second academic year includes the analogous sequence of terms in the following year.

Successful completion of transfer-level math or English is defined as earning a grade of A, B, or C, or a passing grade such as P or CR, in at least one transfer-level course within the specified time window. Grades of D or D minus are not considered successful because a minimum grade of C is required for transfer credit or degree applicability. Students may enroll in multiple math and English courses at both transfer and below transfer levels during the observation period; our outcome measures capture whether a student enrolled in, and separately completed, at least one transfer-level course in each subject area.

Baseline Covariates

We use students' 11th grade state math and ELA assessment scores as measures of baseline academic achievement and college readiness prior to initial college entry. In addition to these assessment measures, we include a set of baseline demographic and socioeconomic covariates. These include race and ethnicity (Black/African American, Hispanic/Latine, Asian, White, and other), gender, age at entry, first-year Pell Grant receipt, principal educational goal at entry, and highest parental education level. While demographic characteristics are fully observed, several socioeconomic variables contain missing values. To preserve sample size and avoid listwise deletion, we include indicator variables for missing categories in the interrupted time series models.

ITS Analysis

We estimated the overall impact of the DE reform on the enrollment and completion of transfer-level math and English courses within the first academic year for student *i* at college *j* in year (cohort) *t* using the following linear probability model:

$$Y_{ijt} = \beta_0 + \beta_1 Time_t + \beta_2 P_{18-19} + \beta_3 P_{19-20} + \beta_4 P_{20-21} + \beta_5 P_{23-24} + \beta_6 P_{24-25} + \beta_7 X_{ijt} + C_j + \varepsilon_{ijt}$$

where:

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 (AB 705 roll-out year) cohort, 0 otherwise
P_{19-20} =	1 for student ***i*** in the fall 2019 (AB 705 full implementation year 1) cohort, 0 otherwise
P_{20-21} =	1 for student ***i*** in the fall 2020 (AB 705 full implementation year 2) cohort, 0 otherwise
P_{23-24} =	1 for student ***i*** in the fall 2023 (AB 705 full implementation year 6) cohort, 0 otherwise
X_{ijt} =	a vector of student background 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, β_4, β_5, and β_6 capture deviations from the baseline trend, estimates of the overall policy impact on the outcomes of the AB705 roll-out cohort (fall 2018 cohort) and four follow-up cohorts (fall 2019, 2021, 2023, and 2024 cohorts), respectively. β_7 captures the effects of a vector of student background variables. For models estimating AB 705 effects on enrollment in and completion of transfer-level math and English courses within the first two academic years, the dummy variable for the fall 2024 cohort is dropped because two-year outcomes are not yet available for this cohort. As a result, the two-year outcome models estimate deviations from the baseline trend only for cohorts with sufficient follow-up time to observe outcomes over the full two-year period.

Because the ITS analytic sample consists of repeated cross-sectional cohorts of FTIC students nested within colleges, we do not assume that student-level errors are independently and identically distributed (iid). Students within the same college may share unobserved institutional conditions, such as advising practices, course scheduling, instructional capacity, local implementation decisions, or other college-level shocks that affect enrollment and completion outcomes. In addition, these unobserved factors may be correlated across cohorts within the same college. Bloom's (2003) basic ITS model assumes iid student-level errors, but his extended specification incorporates school-level cohort random errors that are shared by students in the same academic year. Consistent with this concern in our college-by-cohort setting, we estimate standard errors clustered at the college level. This approach allows residuals to be correlated among students within the same college across cohorts while preserving the fixed-effects specification used to control for time-invariant differences across colleges. The clustered standard errors provide a more conservative inference strategy than iid student-level errors, while the impact estimates remain interpretable as deviations from the pre-reform counterfactual trend.

The single ITS approach has potential weaknesses related to "selection bias" and "history" (Bloom, 2003). First, if the composition of students substantially changed across pre- and post-AB 705 cohorts and such changes affected student outcomes, that variation in selection may bias our estimates, making it difficult to interpret observed deviations from the baseline trends. Second, other concurrent events, like the COVID-19 pandemic or other policy changes that coincided with the reform, may present a problem of history, providing an alternative explanation for the observed reform effects.

We took the following measures to address the potential weaknesses of the ITS design. First, we use a propensity score approach to establish baseline equivalence of all pre- and post-reform cohorts. That is, we estimate inverse probability weights (IPW) using various baseline variables including high school math and ELA assessment scores, baseline demographic background, socio-economic background, and educational goals at entry and estimate the above statistical model with weights. These baseline variables are also included in the statical model to control for any residual variations not addressed by the weight. Second, recent studies reported that the transition to remote instruction and changes in health and work status due to COVID-19 negatively affected both enrollment and outcomes of the community college students during 2020 and 2021 (Bulman & Fairlie, 2022). Our data also showed the upward trend of transfer-level course enrollment and completion rates in the 2018 and 2019 cohorts leveled out in the 2020 and 2021 cohorts. To address this potential problem caused by COVID-19, our ITS model separately estimates the AB705 policy impact on each post-policy cohort (fall 2018, 2019, 2020, and 2023 cohorts).

ITS Analyses Results

Overall Impact of AB 705 on Transfer-Level Math and English Enrollment and Completion Rates within One and Two Academic Years

Table C3 in Appendix C presents the interrupted time series estimates of the effects of AB 705 on transfer level math and English enrollment and completion within one and two academic years. All models incorporate inverse probability weights derived from a multinomial propensity score model to improve baseline equivalence across cohorts, as well as controls for student demographic characteristics, high school socioeconomic status, academic preparation, parental education, and educational goal characteristics. Standard errors are clustered at the college level to account for the nested structure of the data and potential correlation of errors among students within the same college across cohorts. By combining inverse probability weighting, covariate adjustment, college fixed effects, and college clustered standard errors, the estimates reflect changes in outcomes attributable to the reform rather than compositional shifts in observable characteristics over time.

Pre-Reform Trends

Prior to implementation of AB 705, enrollment and completion rates exhibited generally stable baseline trends, though some outcomes showed modest pre-reform changes. Within one year, English enrollment showed a statistically significant positive pre-reform trend, increasing by 1.6 percentage points per cohort, while math enrollment exhibited no statistically significant change over time. For completion within one year, English completion increased by 0.9 percentage points per cohort prior to reform, whereas math completion showed a small but statistically significant negative trend of 0.2 percentage points per cohort.

Within two years, pre-reform trends were small but statistically significant across all four outcomes. Math enrollment declined by 0.3 percentage points per cohort, while English enrollment increased modestly by 0.3 percentage points per cohort. Two-year completion rates declined slightly in both math and English, by 0.4 and 0.3 percentage points per cohort, respectively. These baseline patterns indicate that, absent reform, improvements in transfer-level enrollment and completion were limited, and in several cases outcomes were flat or declining prior to AB 705 implementation.

Effects on Transfer-Level Course Enrollment within One Year

After accounting for baseline trends and student composition, AB 705 was associated with substantial increases in transfer-level enrollment within the first academic year. In the roll-out year, fall 2018, transfer-level math enrollment increased by 5.3 percentage points and English enrollment increased by 6.8 percentage points relative to projected baseline trends. Impacts grew considerably in the first post-implementation cohort, fall 2019, with math enrollment increasing by 18.7 percentage points and English enrollment by 13.4 percentage points. Although effects were somewhat smaller for the fall 2020 cohort, they remained large and statistically significant: math enrollment was 15.1 percentage points above baseline, and English enrollment was 6.6 percentage points higher.

The positive effects persisted and strengthened in later post-reform cohorts. By fall 2023, transfer-level math enrollment was 23.1 percentage points higher than projected under the pre-reform trend, while English enrollment was 10.1 percentage points higher. The fall 2024 cohort showed the largest estimated gains observed in the study period, with math enrollment increasing by 30.7 percentage points and English enrollment by 17.4 percentage points relative to pre-reform projections. These results indicate sustained and substantial increases in early access to transfer-level coursework following AB 705, particularly in mathematics.

Effects on Transfer-level Course Completion within One Year

AB 705 was also associated with meaningful improvements in transfer-level course completion within the first academic year, although completion gains were smaller than enrollment gains. In the fall 2018 roll-out year, transfer-level math completion increased by 2.8 percentage points and English completion increased by 4.1 percentage points relative to projected baseline trends. In fall 2019, completion gains increased to 8.1 percentage points in math and 5.4 percentage points in English. For the fall 2020 cohort, math completion remained 7.4 percentage points above baseline, while the estimated effect on English completion was small and not statistically significant.

Completion effects increased again in later post-reform cohorts. For the fall 2023 cohort, math completion was 11.5 percentage points higher than projected under the pre-reform trend, and English completion was 3.5 percentage points higher. The fall 2024 cohort showed the largest estimated one-year completion gains, with math completion increasing by 18.0 percentage points and English completion by 10.2 percentage points. These findings suggest that AB 705 not only expanded access to transfer-level coursework but also increased successful completion within students' first academic year, especially in mathematics.

Effects on Transfer-Level Course Enrollment within Two Years

When outcomes are measured within two academic years, the estimated impacts remain strong and are generally comparable to or larger than the one-year effects. In the fall 2018 roll-out year, two-year transfer-level enrollment increased by 8.3 percentage points in math and 7.9 percentage points in English relative to projected baseline trends. In fall 2019, enrollment gains were substantial, with increases of 18.2 percentage points in math and 12.7 percentage points in English. In fall 2020, two-year enrollment remained significantly elevated, with increases of 15.6 percentage points in math and 8.2 percentage points in English.

By fall 2023, the most recent cohort with two-year outcomes available, estimated impacts had grown further. Transfer-level math enrollment within two years increased by 29.8 percentage points, while English enrollment increased by 19.1 percentage points relative to pre-reform projections. Two-year outcomes are not yet available for the fall 2024 cohort. Overall, these results suggest that the reform not only accelerated enrollment into transfer-level courses within the first year but also substantially expanded access within the first two years of college.

Effects on Transfer-level Course Completion within Two Years

Completion gains within two years were also positive and statistically significant across all post-reform cohorts with available data. In the fall 2018 roll-out year, math completion increased by 4.7 percentage points and English completion increased by 4.7 percentage points relative to projected trends. In fall 2019, completion increased by 8.2 percentage points in math and 4.9 percentage points in English. For the fall 2020 cohort, two-year completion effects remained positive and statistically significant, with increases of 7.5 percentage points in math and 1.8 percentage points in English.

By fall 2023, two-year completion gains had become substantially larger. Math completion increased by 17.6 percentage points, while English completion increased by 12.1 percentage points relative to projected pre-reform trends. These results confirm that AB705 produced sustained improvements in both access to and successful completion of transfer-level math and English courses within two academic years. The magnitude and persistence of the effects, particularly in mathematics and in the later post-reform cohorts, suggest that the reform substantially altered students' early academic trajectories rather than merely shifting the timing of course enrollment.

Differential Reform Impacts by Race/Ethnicity

Table C4 in Appendix C reports selected estimates from the race and ethnicity subgroup ITS models examining whether the effects of AB 705 differed across racial and ethnic groups during students' first academic year. The full parameter estimates are reported in Appendix Table A4. For simplicity, Table 7 presents the main race and ethnicity coefficients capturing baseline differences relative to White students and the interaction terms between race and ethnicity and the post-reform cohort indicators that estimated whether reform effects differed between each racial and ethnic group and White students. The set of interrupted time series results, reported in Table 6, examines whether the developmental education reform had differential effects across students' race and ethnicity.

Prior to the reform, Black/African American and Hispanic/Latine students had significantly lower rates of first year transfer-level enrollment and completion than White students in both math and English. Relative to White students, Black/African American students' transfer-level math enrollment was 9.5 percentage points lower, and English enrollment was 20.6 percentage points lower. Their completion rates were also lower, by 5.8 percentage points in math and 13.3 percentage points in English. Hispanic/Latine students also had lower enrollment and completion rates than White students, although the estimated baseline gaps were smaller than those observed for Black/African American students. Asian students had higher math enrollment and completion rates than White students, but lower English enrollment rates and no statistically significant difference in English completion. Students in the "other" race and ethnicity category generally had lower enrollment and completion rates than White students, particularly in English.

Effects on Transfer-Level Course Enrollment by Race/Ethnicity

As shown in the overall ITS results, AB 705 was associated with substantial improvements in both transfer-level enrollment and completion for the full analytic sample. The race and ethnicity subgroup models examine whether these overall gains differed across student groups. The interaction results indicate that reform related enrollment gains were generally comparable across racial and ethnic groups. For Black/African American students, math enrollment gains were broadly similar to those of White students in the early post reform cohorts. However, in fall 2024, the math enrollment gain for Black/African American students was 8.0 percentage points smaller than the gain for White students. For English enrollment, Black/African American students' gains were comparable to those of White students across post reform cohorts.

For Hispanic/Latine students, math enrollment gains were generally similar to those of White students across post reform cohorts. In English enrollment, Hispanic/Latine students' gains were also largely comparable to those of White students in most cohorts, although their gain was smaller than that of White students in fall 2023. Asian students' enrollment gains were similar to those of White students in both math and English across post reform cohorts. Students in the "other" race and ethnicity category also showed enrollment gains that were generally comparable to those of White students.

Overall, the enrollment results suggest that AB 705 produced large increases in transfer level enrollment across racial and ethnic groups. However, the subgroup results provide limited evidence that enrollment gains were consistently larger for Black/African American, Hispanic/Latine, Asian, or "other" race and ethnicity students than for White students. In other words, access improved broadly across groups, but the results do not show consistent narrowing of enrollment gaps across post reform cohorts.

Effects on Transfer-Level Course Completion by Race/Ethnicity

The completion results show more variation across racial and ethnic groups, particularly in math. For Black/African American students, math completion gains were smaller than those of White students in several post reform cohorts. These differences were especially evident in fall 2019, fall 2023, and fall 2024. In fall 2024, the math completion gain for Black/African American students was 12.8 percentage points smaller than the gain for White students. In contrast, Black/African American students' English completion gains were generally comparable to those of White students.

For Hispanic/Latine students, math completion gains were also smaller than those of White students in multiple cohorts, including fall 2018, fall 2020, fall 2023, and fall 2024. Hispanic/Latine students also had smaller English completion gains than White students in fall 2020 and fall 2023. These findings suggest that, although AB 705 expanded access to transfer level coursework, completion gains for Hispanic/Latine students did not consistently keep pace with those of White students.

Asian students' completion gains were generally comparable to those of White students, with one exception. In fall 2020, Asian students had a larger math completion gain than White students. Students in the "other" race and ethnicity category also showed completion gains that were mostly comparable to those of White students, although their math completion gain was smaller in fall 2019.

Taken together, the race and ethnicity subgroup results indicate that AB 705 was associated with broad improvements in transfer level enrollment and completion, but these gains did not translate into the same level of progress for all groups. Enrollment increased across racial and ethnic groups, and most subgroup enrollment gains were similar to those of White students. However, completion results were less even. Black/African American and Hispanic/Latine students often had smaller gains in transfer level math completion than White students, and Hispanic/Latine students also had smaller English completion gains in some cohorts. These patterns suggest that expanding access was an important step, but access alone was not enough to ensure equally strong completion outcomes across racial and ethnic groups. Additional academic and institutional supports may be needed to help ensure that increased access to transfer level coursework leads to more equitable completion outcomes, particularly in math.

Differential Reform Impacts by Gender

We also examined whether the developmental education reform had differential impacts across gender by including interaction terms between gender and the post-reform cohort indicators in the ITS model. Table C5 in Appendix C presents the results. The female coefficient captures baseline differences between female and male students in the pre-reform period, while the interaction terms compare post-reform changes for male students relative to female students.

Before the reform, female students had lower rates of first year transfer-level math enrollment than male students, by 2.4 percentage points. Female students' math completion rates were not meaningfully different from those of male students. In English, female students had higher completion rates than male students, by 2.6 percentage points, while the difference in English enrollment was small and not statistically significant.

Effects on Transfer-Level Course Enrollment by Gender

For math enrollment, male students experienced larger gains than female students in some post reform cohorts. The differences were statistically significant in the fall 2018, fall 2019, and fall 2024 cohorts, with male students' gains exceeding female students' gains by 1.5, 1.9, and 3.6 percentage points, respectively. Differences in fall 2020 and fall 2023 were not statistically significant. Because female students already had lower math enrollment rates before the reform, these results suggest that AB 705 did not narrow the pre-reform gender gap in math enrollment and may have widened it in some cohorts.

For English enrollment, differences between male and female students were smaller and less consistent. None of the male versus female interaction terms were statistically significant, indicating that English enrollment gains were generally comparable across gender groups. Although the point estimates suggest somewhat larger gains for male students in fall 2018, fall 2023, and fall 2024, the evidence does not support a clear conclusion that English enrollment gains differed meaningfully by gender.

Effects on Transfer-Level Course Completion by Gender

For math completion, male students experienced larger gains than female students in selected post reform cohorts. The differences were statistically significant in fall 2019 and fall 2024, when male students' math completion gains were 2.1 and 2.9 percentage points larger than those of female students, respectively. Differences in fall 2018, fall 2020, and fall 2023 were not statistically significant. Because male and female students had similar math completion rates prior to the reform, these results suggest that male students experienced somewhat larger improvements in math completion in some cohorts, particularly in the later post reform period.

For English completion, male students' gains were generally similar to those of female students. None of the post reform gender differences were statistically significant, although the point estimates were positive in fall 2018, fall 2019, and fall 2024. Because female students had higher English completion rates before the reform, the absence of consistent gender differences in post reform gains suggests that the pre reform advantage for female students in English completion largely persisted.

Overall, the gender subgroup results indicate that AB705 produced broad improvements in transfer level enrollment and completion for both male and female students. However, the gains were not evenly distributed across all outcomes. Male students experienced larger gains than female students in math enrollment in several cohorts and in math completion in fall 2019 and fall 2024. In contrast, English enrollment and completion gains were generally comparable across gender groups. These findings suggest that the reform did not disproportionately benefit female students and that gender differences in reform effects were most evident in math outcomes.

Differential Reform Impacts Based on Prior Academic Preparation

Since the implementation of AB705, faculty and other stakeholders have raised concerns that increased access to transfer-level coursework may place academically underprepared students into courses for which they are insufficiently prepared. To examine whether the effects of AB705 varied based on students' prior academic preparation, we grouped FTIC students into three achievement levels based on their 11th grade California state math or English Language Arts (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. We then split the full analytic sample into three separate subsamples corresponding to these achievement groups and estimated the weighted ITS models separately for each group. Because the analytic samples differed across the high, middle, and low achievement groups, inverse probability weights were recalculated separately within each subsample before estimating the subgroup-specific ITS models. Table C6 in Appendix C presents the weighted ITS regression results for each achievement group.

Overall, the subgroup-specific ITS results show that AB705 increased transfer-level course enrollment and completion across all three achievement groups. The magnitude and consistency of the effects varied by prior academic preparation, with the strongest gains generally observed among students in the middle achievement group.

High Achievement Group

Students in the high achievement group experienced modest but statistically significant increases in transfer-level enrollment and completion in the early post-reform cohorts. In the roll-out year, fall 2018, transfer-level enrollment increased by 3.3 percentage points in math and 4.1 percentage points in English relative to baseline trends. Corresponding increases in completion were 2.3 percentage points in math and 3.2 percentage points in English. Larger gains were observed in the fall 2019 cohort, particularly in math, where enrollment increased by 8.5 percentage points and completion increased by 5.6 percentage points. English enrollment and completion also increased by 5.8 and 2.5 percentage points, respectively.

In the fall 2020 cohort, estimated effects for high-achieving students were smaller and less consistent. Transfer-level math enrollment increased by 4.9 percentage points, while the estimated effect on math completion was positive but not statistically significant. For English, the estimated effect on enrollment was not statistically significant, and completion declined by 2.4 percentage points relative to baseline trends. These weaker results likely reflect disruptions associated with the COVID-19 pandemic. By the fall 2023 cohort, effects increased substantially. Transfer-level enrollment rose by 13.3 percentage points in math and 12.0 percentage points in English, while completion increased by 8.2 percentage points in math and 6.9

percentage points in English. Gains were even larger for the fall 2024 cohort, with enrollment increasing by 21.8 percentage points in math and 21.5 percentage points in English, and completion increasing by 15.7 percentage points in math and 14.2 percentage points in English.

Middle Achievement Group

The largest and most consistent improvements occurred among students in the middle achievement group. Transfer-level math enrollment increased by 7.2 percentage points in the fall 2018 cohort and by 22.8 percentage points in the fall 2019 cohort relative to baseline trends. Corresponding increases in math completion were 4.1 percentage points and 10.9 percentage points, respectively. Although the magnitude of the gains moderated somewhat in the fall 2020 cohort, improvements remained substantial, with transfer-level math enrollment increasing by 19.5 percentage points and completion increasing by 11.4 percentage points. By the fall 2023 cohort, transfer-level math enrollment increased by 28.5 percentage points and completion increased by 16.2 percentage points. The largest effects were observed in the fall 2024 cohort, when math enrollment increased by 37.2 percentage points and math completion increased by 23.7 percentage points relative to baseline trends.

English outcomes for the middle achievement group followed a similar pattern, although the magnitude of the gains was generally smaller than for math. Transfer-level English enrollment increased by 7.4 percentage points in the fall 2018 cohort and by 13.9 percentage points in the fall 2019 cohort, with corresponding completion gains of 4.8 and 6.6 percentage points, respectively. In the fall 2020 cohort, English enrollment increased by 7.2 percentage points, while completion increased by 1.5 percentage points. By fall 2023, English enrollment increased by 11.0 percentage points and completion increased by 5.1 percentage points. In the fall 2024 cohort, English outcomes improved more sharply, with enrollment increasing by 18.9 percentage points and completion increasing by 12.1 percentage points relative to baseline trends.

Low Achievement Group

Students in the low achievement group also experienced substantial improvements following the implementation of AB705, particularly in transfer-level course enrollment. Transfer-level math enrollment increased by 3.3 percentage points in the fall 2018 cohort and by 18.8 percentage points in the fall 2019 cohort relative to baseline trends. Corresponding increases in math completion were 1.0 percentage point and 5.4 percentage points, respectively. In the fall 2020 cohort, positive effects remained substantial, with transfer-level math enrollment increasing by 16.1 percentage points and completion increasing by 5.4 percentage points. By the fall 2023 cohort, math enrollment increased by 24.1 percentage points, while completion increased by 8.3 percentage points. In the fall 2024 cohort, math enrollment increased by 29.6 percentage points and math completion increased by 12.7 percentage points relative to baseline trends.

English outcomes also improved markedly for students in the low achievement group, especially with respect to enrollment. Transfer-level English enrollment increased by 8.2 percentage points in the fall 2018 cohort and by 20.5 percentage points in the fall 2019 cohort. Corresponding completion gains were 3.2 and 6.4 percentage points, respectively. In the fall 2020 cohort, English enrollment increased by 12.6 percentage points, while completion increased by 2.2 percentage points relative to baseline trends. By fall 2023, English enrollment increased by 11.4 percentage points, although the estimated effect on English completion was small and not statistically significant. In the fall 2024 cohort, English enrollment increased by 16.1 percentage points and completion increased by 5.9 percentage points.

In summary, the results suggest that AB 705 substantially expanded access to transfer-level math and English coursework across the full academic preparation distribution, including among students who were least likely to enroll directly in transfer-level courses prior to the reform. However, the pattern of results also points to an important distinction between access and success. Students in the low achievement group experienced large increases in transfer-level enrollment, but their gains in completion were more modest than those observed for students in the middle achievement group, particularly in English. These findings suggest that expanded access alone may not be sufficient to eliminate disparities in successful completion and that academically less prepared students may continue to need additional supports once enrolled in transfer-level coursework. The sizable gains observed in the fall 2023 and fall 2024 cohorts further suggest that implementation of the reform continued to mature over time, contributing to broader increases in both enrollment and completion across achievement groups.

Impact Study Summary

Our impact study was designed to understand the impact of AB 705 reforms on student outcomes. We find that student characteristics including gender, race, and Pell status significantly predict transfer-level enrollment in the first semester, with variation by subject. Unsurprisingly, parental education, prior academic achievement, and enrollment goals also predict this enrollment. Recognizing that California community colleges are working toward enrolling all students in transfer-level math and English within their first years, knowing that student demographic characteristics can inform this enrollment may be useful to counselors in supporting student decision making.

We examined impact of the reforms in two ways: an IPWRA analysis of post-enrollment academic outcomes, and an ITS analysis of enrollment and completion trends across cohorts. Overall, our analyses suggests that AB 705 substantially expanded access to transfer-level coursework and was also associated with meaningful, though smaller, gains in completion.

Our IPWRA analyses, controlling for student background characteristics and utilizing conservative significance thresholds, find that transfer-level enrollment in the first semester is strongly associated with significantly increased likelihoods of passing transfer-level coursework, improved academic progress, and reduced below-transfer credits. Transfer-level enrollment was also associated with higher GPAs at years 1 and 5, and significantly increased likelihoods of certificate and credential attainment in year 5. Students who enrolled in transfer-level coursework were also significantly more likely to transfer to four-year institutions.

Similarly, our ITS analyses also find significant increases in transfer-level enrollment for students in the post-reform period, particularly in math. We see meaningful improvement in transfer-level completion as well, though completion gains have consistently been smaller than enrollment gains. For example, by Fall 2024, math completion increased by 18 percentage points compared to a 30.7 percentage point gain in enrollment. This suggests that AB 705 substantially expanded access to transfer-level coursework, with more modest corresponding gains in completion. These trends continue when looking at two-year outcomes, suggesting that the reform substantially altered students' early academic trajectories rather that merely shifting the timing of course enrollment.

Our subgroup analyses indicate that AB 705 increased transfer-level course enrollment broadly across racial and ethnic groups, with gains generally comparable across groups. However, completion gains were less unilateral: Black and Latine students had smaller gains in transfer-level math completion than White students in several post-reform cohorts, and Latine students also had smaller English completion gains in some cohorts. We also find gender differences in math outcomes. Male students experienced larger gains than female students in transfer-level math enrollment in Falls 2018, 2019, and 2024, and in math completion in Falls 2019 and 2024. Because female students had lower pre-reform math enrollment rates, these results suggest that AB 705 did not narrow the pre-existing gender gap in math enrollment and may have widened it in some cohorts. English enrollment and completion gains were generally comparable across gender groups. These patterns suggest that expanded access did not translate into equally strong completion outcomes across groups.

Cost Effectiveness Study

While community colleges have increasingly replaced traditional developmental education with direct placement into introductory, transfer-level coursework, little is known about the cost-effectiveness of these reforms or the relative value of alternative support models. This component of the study examines the cost-effectiveness of institutional reforms in response to AB 705. Using linked administrative, survey, and cost data, the research team explored whether transfer-level placement was more cost-effective than traditional developmental education and how the three most common cocurricular models (i.e., embedded tutoring, enhanced courses, and corequisites courses) compared with standalone transfer-level courses. Additional details about the approach and findings are available in our year 4 report (Burkander et al., 2025), but we summarize high-level findings here.

Data and Methods

Costs were estimated using an ingredients-based approach (Levin et al., 2018) and effects using 1) inverse probability weighted regression adjustment for transfer-level placement versus developmental education and 2) propensity score matching for cocurricular support model comparisons. Incremental costs and incremental effects were also combined using the incremental cost-effectiveness ratio (ICER):

$$ICER = \frac{Cost_{Alternative} - Cost_{Comparison}}{Effect_{Alternative} - Effect_{Comparison}}$$

The ICER represents the incremental combined measured cost associated with producing one additional unit of outcome when moving from the comparison condition to the alternative condition. The cost estimates reflect institution-borne costs and selected student-borne course-related costs captured within the study's measured-cost framework; they do not represent a full social-cost accounting. When incremental costs are negative and incremental effects are positive, the alternative is both less costly and more effective within the measured-cost framework.

Findings

In both math and English, transfer-level placement was associated with lower estimated per-student costs and better outcomes than developmental education. All cost estimates are reported in 2019 dollars in this analysis. Developmental education costs were benchmarked from prior studies and harmonized to a California 2019 price frame to support comparability with the transfer-level placement estimates. In math, total measured per-student costs were $180 for transfer-level placement versus $1,521 for developmental education; in English, the corresponding costs were $163 and $1,452. Within the transfer-level condition, most measured per-student costs reflected student-borne costs rather than institutional costs. The developmental education estimates similarly include institutional instructional costs and student-borne costs for courses whose credits did not apply toward degree requirements. Thus, the higher developmental education totals reflect both the multi-course structure of prerequisite pathways and the cost burden associated with them.

In math, transfer-level placement reduced per-student costs by $1,341 and increased one-year transfer-level math completion by 35.7 percentage points, corresponding to an ICER of −$3,756 per additional one-year completer. For four-year transfer-level course completion, the incremental effect was 26.5 percentage points, yielding an ICER of −$5,060. For any community college credential completion within four years, the incremental effect was 6.3 percentage points, yielding an ICER of −$21,286.

In English, transfer-level placement reduced per-student costs by $1,289 and increased one-year transfer-level English completion by 28.6 percentage points, corresponding to an ICER of −$4,507 per additional one-year completer. For four-year transfer-level course completion, the incremental effect was 18.8 percentage points, yielding an ICER of −$6,856. For community college credential completion, the incremental effect was 8.6 percentage points, yielding an ICER of −$14,988. In both subjects, transfer-level placement was associated with lower costs and better outcomes.

Cocurricular support models generally cost more than standalone transfer-level courses. In 2023 dollars, standalone transfer-level courses had the lowest per-student institutional costs in both math and English, partly because they served substantially more students and distributed fixed implementation costs more broadly. Cocurricular support models had higher per-student costs because they served fewer students and required additional resources such as support personnel, instructional time, or linked support courses. Among support models, corequisites had the lowest total per-student cost in both subjects. Personnel-heavy models, such as embedded tutoring in English, had higher resource demands, and the high per-student cost for enhanced math sections should be interpreted cautiously given the small number of students served (N = 88).

Estimated incremental effects were generally small and mostly not statistically significant. The main exception was math embedded tutoring, which was associated with a 5.0 percentage-point increase in one-year completion at an incremental cost of $229 per student, which corresponds to an ICER of approximately $4,580 per additional one-year completer. For all other one-year comparisons, effects were small and not statistically significant. The two-year results followed a similar pattern: effects remained small and nonsignificant, although embedded tutoring showed the largest positive estimates in both subjects.

Overall, there is limited evidence that support models consistently improved completion relative to standalone courses. This may be partially related to the fact that faculty were implementing equity-minded practices in both standalone and concurrently supported courses, and because students needing additional support were commonly not enrolling in the concurrently supported sections (RP Group, 2026). However, the cost differences across models remain informative. Standalone courses were least costly, and corequisites had the lowest incremental cost among supports. Because most incremental effects were small and rarely distinguishable from zero, separate cost and effect estimates are more useful than ICERs for these comparisons.

Conclusion

AB 705 and 1705 have fundamentally transformed academic pathways for students in the largest and most diverse community college system in the country. All students now have access to transfer-level math and English upon entry and enrollment in transfer-level courses has increased substantially. Before the reform, roughly 17% of first-time students enrolled in transfer-level math within their first year. By fall 2024, that figure was 46.9%. Transfer-level English enrollment rose from approximately 46% to 63.3% over the same period. This represents a near-tripling of math access and a substantial expansion of English access across the largest community college system in the country, achieved within a decade.

Transfer-level enrollment also delivered long-term benefits for many students who experienced it. After adjusting for observable background characteristics, first-term transfer-level math enrollment was associated with a 36 percentage point higher probability of passing a transfer-level math course within one year, 4.5 additional transfer-level credits by year five, and 6.5 fewer below-transfer-level credits. By year five, transfer-level math enrollment was associated with a 6.4 percentage point increase in associate degree attainment and an 8.4 percentage point increase in transfer to a four-year institution. English outcomes followed a comparable pattern.

The completion picture is more complicated. Enrollment gains across the post-reform period consistently and substantially exceeded completion gains. For example, by fall 2023, two-year math enrollment was 29.8 percentage points above baseline, while two-year completion was 17.6 percentage points above baseline.

Our implementation work has highlighted the work that California community colleges have done in response to these reforms, reshaping their placement practices and instructional strategies. Many colleges have also concurrently undertaken equity initiatives, from classroom-based reforms to campus-wide engagement, to provide better support to their racially minoritized students. AB 705 and 1705 are part of a larger culture change happening across the California community college system. Indeed, while many colleges have reduced the number of course sections with concurrent support, faculty have commonly embraced growth mindsets and equity-minded instructional practices which are applied in standalone courses as well as those with concurrent support, particularly in English. These changes may be contributing to the gains in enrollment and completion that we observe in later years of the study, particularly among racially minoritized and low-prior-achievement students.

Our cost study provides additional support for the benefit of direct enrollment in transfer-level coursework; this approach is far more cost effective than developmental education. The autonomy of individual system colleges has meant that implementation has varied widely, which makes it difficult for us to measure cost-effectiveness of cocurricular support strategies. More research is needed to identify the impact of the various concurrent support approaches, although we have suggestive evidence that corequisites with embedded tutors can be beneficial in math courses.

Developmental reforms in California, like those in other states, were prompted by equity concerns regarding access to transferable coursework for racially minoritized students, particularly Black and Latine students in the California context. Our analyses suggest that these reforms have helped to narrow racial gaps in enrollment in transfer-level math and English, as well as those in English completion, but that Black and Latine students and those with lower prior academic preparation may need additional support to narrow racial completion gaps, particularly in math. Our implementation study highlights the role that faculty instructional practices have played in promoting student success. Recognizing the diversity of math pathways, and the ways in which these reforms have been experienced differently between English and math departments, future research should explore how, if at all, these reforms have influenced students' major choices. The field also needs additional guidance regarding how variations in cocurricular support are implemented and how they impact student outcomes.

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Appendix A. Faculty Survey Demographics

Table A1. Demographics of Faculty Survey Respondents, 2024-2026

Demographics	2024	2025	2026
N faculty	121	142	75
% English	56.2	62	50.7
% Math	43.8	38	49.3
Race/Ethnicity			
Hispanic/Latine	9.1	11.3	20
Asian	5	9.2	8
White	41.3	59.2	54.7
Black/African American	0.8	1.4	4
Middle Eastern/North African	2.5	1.4	1.3
American Indian/Alaska Native	0	0	1.3
Other Race	0	1.4	1.3
Two or More Races	0.8	4.2	1.3
Missing Race	40.5	12	8
Gender			
Female	38	57.8	50.7
Male	22.3	36.6	42.7
Non Binary	0.8	0.7	1.3
Missing Gender	38.8	4.9	5.3
Teaching Tenure			
0-2 Years	4.1	2.8	1.3
3-5 Years	5	5.6	9.3
6-10 Years	8.3	21.1	12
11 or More Years	46.3	70.4	77.3
Missing Tenure	36.4	0	0

Note: Faculty who reported not teaching English or math were dropped from the sample (N(2024) = 5; N(2025) = 1; N(2026) = 1). Percentages in the race variable do not sum to 100% because faculty could indicate more than one option.

Appendix B. IPWRA Analysis Results

Table 1

Balance Check with Standardized Mean Difference Before and After IPWRA for the Math Sample

	Unadjusted			Adjusted		
Variable	Below-Transfer-Level *M* (*SD*)	Transfer-Level *M* (*SD*)	*SMD*	Below-Transfer-Level *M* (*SD*)	Transfer-Level *M* (*SD*)	*SMD*
Demographics						
Female	0.476 (0.499)	0.452 (0.498)	0.058	0.468 (0.499)	0.476 (0.499)	0.019
Race						
White	0.182 (0.386)	0.264 (0.441)	0.289	0.209 (0.407)	0.214 (0.410)	0.018
Black	0.036 (0.185)	0.018 (0.132)	0.431	0.031 (0.172)	0.025 (0.156)	0.134
Hispanic/Latine	0.626 (0.484)	0.463 (0.499)	0.402	0.573 (0.495)	0.571 (0.495)	0.005
Asian	0.081 (0.273)	0.178 (0.382)	0.545	0.113 (0.316)	0.117 (0.321)	0.024
Other	0.045 (0.208)	0.056 (0.230)	0.140	0.049 (0.216)	0.050 (0.219)	0.013
Unknown	0.030 (0.170)	0.021 (0.144)	0.222	0.025 (0.158)	0.022 (0.147)	0.079
Age	18.062 (0.569)	18.008 (0.487)	0.100	18.046 (0.559)	18.055 (0.513)	0.017
Parents' highest education level						
HS diploma or less	0.383 (0.486)	0.292 (0.455)	0.248	0.350 (0.477)	0.346 (0.476)	0.011
Some college but no degree	0.190 (0.392)	0.172 (0.377)	0.074	0.185 (0.389)	0.188 (0.391)	0.012
Associate degree	0.093 (0.291)	0.090 (0.286)	0.022	0.099 (0.299)	0.095 (0.294)	0.028
Bachelor's degree	0.140 (0.347)	0.235 (0.424)	0.385	0.167 (0.373)	0.165 (0.371)	0.009
Advanced degree	0.071 (0.257)	0.115 (0.319)	0.322	0.083 (0.275)	0.085 (0.279)	0.016
No parent or unknown	0.122 (0.328)	0.096 (0.295)	0.163	0.116 (0.320)	0.121 (0.326)	0.029
First-year financial aid applicant	0.673 (0.469)	0.630 (0.483)	0.115	0.658 (0.474)	0.665 (0.472)	0.019
First-semester Pell grant recipient	0.393 (0.488)	0.328 (0.470)	0.171	0.373 (0.484)	0.363 (0.481)	0.026
Pre-College Academic Measures						
Highest-level math course						
Tier 1 group	0.034 (0.181)	0.003 (0.052)	1.490	0.022 (0.147)	0.028 (0.164)	0.150
Tire 2 group	0.164 (0.370)	0.026 (0.160)	1.209	0.113 (0.317)	0.133 (0.340)	0.113
Tier 3 group	0.416 (0.493)	0.252 (0.434)	0.454	0.362 (0.480)	0.358 (0.479)	0.011

Variable	Unadjusted: Below-Transfer-Level M (SD)	Unadjusted: Transfer-Level M (SD)	Unadjusted: SMD	Adjusted: Below-Transfer-Level M (SD)	Adjusted: Transfer-Level M (SD)	Adjusted: SMD
Tier 4 group	0.387 (0.487)	0.719 (0.449)	0.848	0.503 (0.500)	0.481 (0.500)	0.053
Grade in highest-level math course						
Grade A+ or A	0.107 (0.309)	0.233 (0.423)	0.564	0.145 (0.352)	0.149 (0.356)	0.019
Grade A-	0.052 (0.222)	0.100 (0.300)	0.428	0.072 (0.259)	0.067 (0.250)	0.047
Grade B+	0.031 (0.173)	0.056 (0.230)	0.374	0.037 (0.189)	0.036 (0.185)	0.017
Grade B	0.164 (0.371)	0.224 (0.417)	0.234	0.191 (0.393)	0.185 (0.388)	0.024
Grade B-	0.088 (0.284)	0.100 (0.299)	0.085	0.092 (0.289)	0.092 (0.289)	0.000
Grade C+	0.047 (0.212)	0.037 (0.190)	0.151	0.044 (0.205)	0.044 (0.206)	0.000
Grade C	0.197 (0.397)	0.143 (0.350)	0.234	0.179 (0.383)	0.171 (0.377)	0.034
Grade C-	0.089 (0.285)	0.040 (0.196)	0.516	0.072 (0.258)	0.070 (0.255)	0.018
Grade D+	0.022 (0.147)	0.006 (0.080)	0.797	0.016 (0.126)	0.025 (0.156)	0.276
Grade D	0.096 (0.294)	0.031 (0.173)	0.727	0.073 (0.261)	0.076 (0.266)	0.026
Grade D-	0.036 (0.185)	0.011 (0.105)	0.734	0.027 (0.161)	0.026 (0.158)	0.023
Grade F	0.071 (0.257)	0.019 (0.137)	0.832	0.052 (0.222)	0.060 (0.237)	0.092
Math CAASPP test *z*-score	-0.260 (0.643)	0.498 (0.708)	1.132	-0.021 (0.706)	-0.127 (0.904)	0.134
Educational goal						
Personal development or other requirements	0.070 (0.256)	0.056 (0.230)	0.144	0.062 (0.241)	0.055 (0.227)	0.077
Community college degree	0.068 (0.252)	0.029 (0.168)	0.541	0.055 (0.228)	0.061 (0.239)	0.067
Transfer to a 4-year institution	0.705 (0.456)	0.776 (0.417)	0.225	0.722 (0.448)	0.719 (0.449)	0.009
Undecided or unknown	0.156 (0.363)	0.140 (0.347)	0.077	0.161 (0.367)	0.165 (0.372)	0.018
Student *N*	11,808	7,768	—	11,808	7,768	—

Note. Total Student *N* = 19,576. *SMD* = standardized mean difference. We calculated *SMD*s using Hedges' *g* for continuous variables and the Cox index for dichotomous variables. Shaded cells indicate *SMD*s greater than 0.05.

Table 2

Balance Check with Standardized Mean Difference Before and After IPWRA for the English Sample

	Unadjusted			Adjusted		
	Below-Transfer Level	Transfer Level		Below-Transfer Level	Transfer Level	
Variable	*M* (*SD*)	*M* (*SD*)	*SMD*	*M* (*SD*)	*M* (*SD*)	*SMD*
Demographics						
Female	0.454 (0.498)	0.490 (0.500)	0.088	0.456 (0.498)	0.475 (0.499)	0.046
Race						
White	0.135 (0.342)	0.253 (0.435)	0.473	0.207 (0.405)	0.215 (0.411)	0.029
Black	0.040 (0.195)	0.027 (0.162)	0.246	0.035 (0.184)	0.032 (0.176)	0.056
Hispanic/Latine	0.697 (0.460)	0.525 (0.499)	0.444	0.582 (0.493)	0.581 (0.493)	0.002
Asian	0.066 (0.249)	0.119 (0.324)	0.387	0.103 (0.304)	0.101 (0.302)	0.013
Other	0.041 (0.199)	0.051 (0.220)	0.139	0.048 (0.213)	0.047 (0.211)	0.013
Unknown	0.021 (0.142)	0.025 (0.157)	0.108	0.026 (0.159)	0.024 (0.154)	0.050
Age	18.097 (0.603)	18.037 (0.530)	0.110	18.068 (0.582)	18.063 (0.555)	0.009
Parents' highest education level						
HS diploma or less	0.435 (0.496)	0.322 (0.467)	0.293	0.370 (0.483)	0.358 (0.479)	0.031
Some college but no degree	0.168 (0.374)	0.191 (0.393)	0.095	0.183 (0.387)	0.184 (0.388)	0.004
Associate degree	0.084 (0.278)	0.098 (0.297)	0.103	0.089 (0.284)	0.092 (0.289)	0.022
Bachelor's degree	0.113 (0.317)	0.196 (0.397)	0.393	0.166 (0.372)	0.171 (0.377)	0.022
Advanced degree	0.055 (0.228)	0.097 (0.296)	0.371	0.081 (0.273)	0.084 (0.277)	0.024
No parent or unknown	0.146 (0.353)	0.096 (0.294)	0.289	0.111 (0.315)	0.111 (0.314)	0.000
First-year financial aid applicant	0.720 (0.449)	0.646 (0.478)	0.208	0.682 (0.466)	0.661 (0.473)	0.058
First-semester Pell grant recipient	0.438 (0.496)	0.346 (0.476)	0.235	0.388 (0.487)	0.370 (0.483)	0.046
Pre-College Academic Measures						
Highest-level English course						
Tier 1 group	0.004 (0.064)	0.002 (0.043)	0.421	0.003 (0.052)	0.003 (0.050)	0.000
Tire 2 group	0.011 (0.104)	0.007 (0.081)	0.276	0.008 (0.089)	0.008 (0.090)	0.000
Tier 3 group	0.059 (0.235)	0.047 (0.211)	0.145	0.051 (0.220)	0.051 (0.219)	0.000
Tier 4 group	0.926 (0.261)	0.945 (0.229)	0.192	0.939 (0.240)	0.939 (0.240)	0.000

Variable	Unadjusted			Adjusted		
	Below-Transfer Level	Transfer Level		Below-Transfer Level	Transfer Level	
	M (*SD*)	*M* (*SD*)	*SMD*	*M* (*SD*)	*M* (*SD*)	*SMD*
Grade in highest-level English course						
Grade A+ or A	0.207 (0.405)	0.330 (0.470)	0.385	0.260 (0.439)	0.285 (0.451)	0.076
Grade A-	0.076 (0.264)	0.132 (0.338)	0.367	0.108 (0.311)	0.112 (0.315)	0.025
Grade B+	0.053 (0.223)	0.064 (0.246)	0.121	0.063 (0.243)	0.061 (0.240)	0.021
Grade B	0.222 (0.415)	0.225 (0.418)	0.010	0.246 (0.431)	0.221 (0.415)	0.085
Grade B-	0.091 (0.288)	0.082 (0.274)	0.069	0.090 (0.287)	0.084 (0.278)	0.046
Grade C+	0.050 (0.217)	0.032 (0.177)	0.282	0.035 (0.184)	0.039 (0.194)	0.068
Grade C	0.172 (0.378)	0.085 (0.278)	0.488	0.117 (0.322)	0.117 (0.321)	0.000
Grade C-	0.052 (0.223)	0.022 (0.147)	0.540	0.033 (0.180)	0.035 (0.185)	0.037
Grade D+	0.015 (0.120)	0.005 (0.068)	0.672	0.008 (0.086)	0.008 (0.087)	0.000
Grade D	0.040 (0.196)	0.014 (0.118)	0.652	0.025 (0.155)	0.023 (0.151)	0.052
Grade D-	0.010 (0.099)	0.004 (0.065)	0.559	0.007 (0.081)	0.007 (0.081)	0.000
Grade F	0.013 (0.112)	0.004 (0.066)	0.720	0.008 (0.088)	0.007 (0.084)	0.082
English CAASPP test z-score	-0.419 (0.756)	0.213 (0.754)	0.835	-0.041 (0.736)	-0.017 (0.887)	0.028
Educational goal						
Personal development or other requirements	0.079 (0.270)	0.063 (0.243)	0.148	0.067 (0.250)	0.069 (0.254)	0.019
Community college degree	0.090 (0.286)	0.047 (0.211)	0.422	0.061 (0.239)	0.059 (0.236)	0.021
Transfer to a 4-year institution	0.661 (0.473)	0.753 (0.431)	0.268	0.724 (0.447)	0.726 (0.446)	0.006
Undecided or unknown	0.170 (0.375)	0.137 (0.344)	0.149	0.148 (0.355)	0.146 (0.353)	0.010
Student *N*	7,161	16,974	—	7,161	16,974	—

Note. Total Student *N* = 24,135. *SMD* = standardized mean difference. We calculated *SMD*s using Hedges' *g* for continuous variables and the Cox index for dichotomous variables. Shaded cells indicate *SMD*s greater than 0.05.

Table 3

Predictors of Transfer-Level Course Taking in the First Semester of College

	Transfer-Level Course Taking in the First Semester of College	
	Math	English
Variable	*AME* (*SE*)	*AME* (*SE*)
Demographics		
Female	0.030*** (0.006)	0.010 (0.005)
Race (Ref. = White)		
Black	-0.038 (0.019)	-0.054** (0.016)
Hispanic/Latine	-0.013 (0.008)	-0.071*** (0.007)
Asian	0.029* (0.011)	-0.009 (0.010)
Other	0.002 (0.014)	-0.042** (0.013)
Unknown	-0.002 (0.024)	-0.047 (0.022)
Age	-0.007 (0.005)	-0.008 (0.004)
Parents' highest education level (Ref. = High school diploma or less)		
Some college, no degree	-0.005 (0.008)	0.022* (0.007)
Associate degree	0.011 (0.010)	0.016 (0.009)
Bachelor's degree	0.046*** (0.009)	0.037*** (0.008)
Advanced degree	0.043** (0.012)	0.044*** (0.011)
No parent or unknown	-0.016 (0.011)	-0.012 (0.010)
First-year financial aid applicant	0.013 (0.008)	-0.007 (0.007)
First-semester Pell grant recipient	0.006 (0.007)	-0.018* (0.006)
Pre-College Academic Measures		
Highest-level course (Ref. = Tier 1 group)		
Tier 2 group	0.079* (0.022)	0.039 (0.058)
Tier 3 group	0.228*** (0.021)	0.075 (0.052)
Tier 4 group	0.343*** (0.021)	0.076 (0.051)
Grade in highest-level course (Ref. = Max tier course grade F)		
Max tier course grade D-	0.029 (0.023)	0.036 (0.047)
Max tier course grade D	0.023 (0.017)	-0.008 (0.038)
Max tier course grade D+	-0.019 (0.025)	-0.041 (0.046)
Max tier course grade C-	0.056* (0.017)	0.006 (0.036)
Max tier course grade C	0.120*** (0.015)	0.046 (0.034)
Max tier course grade C+	0.143*** (0.019)	0.080 (0.036)
Max tier course grade B-	0.180*** (0.016)	0.135*** (0.034)
Max tier course grade B	0.195*** (0.015)	0.162*** (0.034)
Max tier course grade B+	0.235*** (0.020)	0.183*** (0.035)

Variable	Transfer-Level Course Taking in the First Semester of College	
	Math	English
	AME (*SE*)	*AME* (*SE*)
Max tier course grade A-	0.224*** (0.017)	0.224*** (0.034)
Max tier course grade A or A+	0.240*** (0.015)	0.220*** (0.033)
Math CAASPP test *z*-score	0.200*** (0.004)	0.150*** (0.003)
Educational goal (Ref. = Transfer to a 4-year institution)		
Personal development or other requirements	-0.034* (0.012)	-0.041*** (0.010)
Community college degree	-0.074*** (0.013)	-0.051*** (0.011)
Undecided or unknown	-0.029* (0.009)	-0.022* (0.008)
Sample Size	19,576	24,135

Note. The table presents logistic regression results, and each column represents a separate regression model. All models included college fixed effects. We present average marginal effects (*AME*s) and standard errors (*SE*s) for each covariate included in the binary logistic regression models.

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

Appendix C. ITS Analysis Results

Table C1. Number of FTIC Students Included in the Initial Sample by Cohort

College entry year of FTIC students in fall cohort										
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
105,771	102,919	95,215	96,196	93,865	102,955	86,194	96,010	103,942	116,066	128,783

Table C2. Number of FTIC Students Included in the Analytic Sample by Cohort

College entry year of FTIC students in fall cohort										
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
54,135	Dropped	46,997	49,571	57,553	64,588	56,640	Dropped	Dropped	65,336	77,051

Table C3. Interrupted Time Series Analysis Results of the Development Education Reform on the Enrollment and Completion of Transfer-Level Math and English Courses within One and Two Academic Years

	Transfer-level course enrollment		Transfer-level course completion	
	Math	English	Math	English
Enrollment and Completion of Transfer-Level Course within One Year				
Time	-0.0002 (0.0023)	0.0157*** (0.0045)	-0.0018 (0.0015)	0.0088** (0.0031)
Fall 2018 cohort (roll-out year)	0.0527*** (0.0076)	0.0679*** (0.0120)	0.0281*** (0.0060)	0.0407*** (0.0094)
Fall 2019 cohort (follow-up year 1)	0.1868*** (0.0171)	0.1341*** (0.0194)	0.0813*** (0.0102)	0.0544*** (0.0128)
Fall 2020 cohort (follow-up year 2)	0.1508*** (0.0225)	0.0664* (0.0322)	0.0743*** (0.0144)	0.0050 (0.0216)
Fall 2023 cohort (follow-up year 5)	0.2305*** (0.0280)	0.1011** (0.0365)	0.1145*** (0.0176)	0.0352 (0.0255)
Fall 2024 cohort (follow-up year 6)	0.3070*** (0.0279)	0.1744*** (0.0402)	0.1798*** (0.0187)	0.1019*** (0.0287)
Enrollment and Completion of Transfer-Level Course within Two Years				
Time	-0.0029 (0.0025)	0.0033 (0.0039)	-0.0042* (0.0019)	-0.0025 (0.0029)

Fall 2018 cohort (roll-out year)	0.0825*** (0.0085)	0.0791*** (0.0102)	0.0466*** (0.0072)	0.0470*** (0.0088)
Fall 2019 cohort (follow-up year 1)	0.1824*** (0.0161)	0.1266*** (0.0169)	0.0818*** (0.0106)	0.0490*** (0.0124)
Fall 2020 cohort (follow-up year 2)	0.1556*** (0.0219)	0.0819** (0.0292)	0.0751*** (0.0152)	0.0176 (0.0212)
Fall 2023 cohort (follow-up year 5)	0.2976*** (0.0263)	0.1909*** (0.0333)	0.1761*** (0.0199)	0.1213*** (0.0266)
Fall 2024 cohort (follow-up year 6)	n.a. (n.a.)	n.a. (n.a.)	n.a. (n.a.)	n.a. (n.a.)

Note: All models include variables for student background characteristics. Standard errors are shown in parentheses. *** p<0.001, ** p<0.01, * p<0.05

Table C4. Effects of the Development Education Reform on the Enrollment and Completion of Transfer-Level Math and English Courses during the First Academic Year, by Race/Ethnicity Group

	Transfer-level course enrollment		**Transfer-level course completion**	
	Math	**English**	**Math**	**English**
Race/Ethnicity				
Black/African American	-0.0951*** (0.0144)	-0.2058*** (0.0205)	-0.0582*** (0.0104)	-0.1332*** (0.0183)
Hispanic/Latine	-0.0618*** (0.0115)	-0.1288*** (0.0167)	-0.0412*** (0.0076)	-0.0826*** (0.0132)
Asian	0.0842*** (0.0187)	-0.0578** (0.0218)	0.0737*** (0.0154)	-0.0184 (0.0174)
Other	-0.0300* (0.0138)	-0.0747*** (0.0158)	-0.0202 (0.0110)	-0.0515*** (0.0138)
White vs. Black/African American				
Fall 2018 cohort	-0.0205 (0.0131)	0.0129 (0.0215)	-0.0138 (0.0100)	0.0053 (0.0174)
Fall 2019 cohort	-0.0061 (0.0207)	0.0342 (0.0286)	-0.0496*** (0.0138)	-0.0135 (0.0217)

Fall 2020 cohort	0.0107 (0.0348)	0.0525 (0.0498)	-0.0394 (0.0250)	0.0029 (0.0382)
Fall 2023 cohort	-0.0420 (0.0366)	-0.0429 (0.0564)	-0.0871** (0.0298)	-0.0592 (0.0439)
Fall 2024 cohort	-0.0798* (0.0366)	-0.0670 (0.0563)	-0.1280*** (0.0294)	-0.0599 (0.0426)
White vs. Hispanic/Latine				
Fall 2018 cohort	-0.0037 (0.0173)	0.0163 (0.0187)	-0.0446*** (0.0103)	-0.0187 (0.0149)
Fall 2019 cohort	0.0139 (0.0320)	0.0198 (0.0416)	-0.0366 (0.0208)	-0.0118 (0.0314)
Fall 2020 cohort	-0.0178 (0.0370)	-0.0542 (0.0367)	-0.0782** (0.0243)	-0.0794** (0.0276)
Fall 2023 cohort	-0.0387 (0.0374)	-0.0833* (0.0366)	-0.1072*** (0.0247)	-0.0957*** (0.0276)
Fall 2024 cohort	-0.0037 (0.0173)	0.0163 (0.0187)	-0.0446*** (0.0103)	-0.0187 (0.0149)
White vs. Asian				
Fall 2018 cohort	0.0114 (0.0149)	0.0199 (0.0177)	0.0197 (0.0149)	0.0222 (0.0188)
Fall 2019 cohort	-0.0151 (0.0280)	-0.0229 (0.0283)	-0.0020 (0.0217)	-0.0104 (0.0234)
Fall 2020 cohort	0.0450 (0.0404)	-0.0050 (0.0543)	0.0591* (0.0287)	-0.0009 (0.0386)
Fall 2023 cohort	0.0736 (0.0584)	-0.0369 (0.0611)	0.0491 (0.0428)	-0.0108 (0.0462)
Fall 2024 cohort	0.0989 (0.0610)	-0.0337 (0.0645)	0.0773 (0.0460)	0.0133 (0.0515)
White vs. Other				
Fall 2018 cohort	-0.0109	0.0079	-0.0091	-0.0086

	(0.0146)	(0.0172)	(0.0120)	(0.0162)
Fall 2019 cohort	-0.0260	-0.0006	-0.0363*	-0.0154
	(0.0201)	(0.0234)	(0.0149)	(0.0175)
Fall 2020 cohort	0.0137	0.0495	-0.0094	0.0195
	(0.0307)	(0.0403)	(0.0228)	(0.0279)
Fall 2023 cohort	-0.0102	-0.0284	-0.0292	-0.0331
	(0.0397)	(0.0449)	(0.0325)	(0.0342)
Fall 2024 cohort	-0.0328	-0.0180	-0.0572	-0.0152
	(0.0407)	(0.0435)	(0.0307)	(0.0342)

Note: All models include variables for student background characteristics. Standard errors are shown in parentheses. *** p<0.001, ** p<0.01, * p<0.05

Table C5. Effects of the Development Education Reform on the Enrollment and Completion of Transfer-Level Math and English Courses during the First Academic Year, by Gender

	Transfer-level course enrollment		**Transfer-level course completion**	
	Math	**English**	**Math**	**English**
Female	-0.0239***	0.0124	-0.0043	0.0264***
	(0.0048)	(0.0065)	(0.0036)	(0.0060)
Male vs. Female				
Fall 2018 cohort	0.0149*	0.0074	0.0081	0.0061
	(0.0057)	(0.0065)	(0.0045)	(0.0061)
Fall 2019 cohort	0.0192*	-0.0058	0.0210**	0.0075
	(0.0085)	(0.0087)	(0.0066)	(0.0076)
Fall 2020 cohort	0.0103	-0.0122	0.0073	-0.0070
	(0.0104)	(0.0099)	(0.0077)	(0.0095)
Fall 2023 cohort	0.0222	0.0055	0.0089	-0.0070
	(0.0152)	(0.0156)	(0.0107)	(0.0140)
Fall 2024 cohort	0.0357*	0.0251	0.0289*	0.0127
	(0.0174)	(0.0180)	(0.0136)	(0.0165)

Note: All models include variables for student background characteristics. Standard errors are shown in parentheses. *** p<0.001, ** p<0.01, * p<0.05

Table C6. Enrollment and Completion of Transfer-Level Math and English Courses within One Academic Year by High School Math and English Achievement Level

	Transfer-level course enrollment		**Transfer-level course completion**	
	Math	**English**	**Math**	**English**
High Achievement: Above 75th Percentile				
Time	-0.0017	-0.0060	0.0007	-0.0023
	(0.0052)	(0.0060)	(0.0038)	(0.0052)
Fall 2018 cohort	0.0334**	0.0414**	0.0231*	0.0323*
	(0.0121)	(0.0138)	(0.0101)	(0.0129)
Fall 2019 cohort	0.0848***	0.0579**	0.0558***	0.0246
	(0.0199)	(0.0220)	(0.0163)	(0.0190)
Fall 2020 cohort	0.0487	0.0096	0.0216	-0.0241
	(0.0386)	(0.0427)	(0.0289)	(0.0350)
Fall 2023 cohort	0.1328**	0.1199*	0.0820*	0.0685
	(0.0427)	(0.0477)	(0.0318)	(0.0431)
Fall 2024 cohort	0.2183***	0.2145***	0.1565***	0.1420**
	(0.0475)	(0.0555)	(0.0346)	(0.0492)
Middle Achievement: Between 25th and 75th Percentile				
Time	-0.0023	0.0139**	-0.0070***	0.0073*
	(0.0052)	(0.0048)	(0.0019)	(0.0033)
Fall 2018 cohort	0.0323*	0.0738***	0.0414***	0.0482***
	(0.0129)	(0.0129)	(0.0074)	(0.0107)
Fall 2019 cohort	0.0246	0.1387***	0.1094***	0.0663***
	(0.0190)	(0.0202)	(0.0123)	(0.0138)
Fall 2020 cohort	-0.0241	0.0722*	0.1135***	0.0152
	(0.0350)	(0.0316)	(0.0158)	(0.0217)
Fall 2023 cohort	0.0685	0.1098**	0.1622***	0.0506
	(0.0431)	(0.0373)	(0.0204)	(0.0264)
Fall 2024 cohort	0.1420**	0.1892***	0.2370***	0.1212***
	(0.0492)	(0.0419)	(0.0217)	(0.0301)

Low Achievement: Below 25th Percentile				
Time	0.0016	0.0297***	-0.0008	0.0161***
	(0.0020)	(0.0050)	(0.0010)	(0.0028)
Fall 2018 cohort	0.0329***	0.0817***	0.0096**	0.0319***
	(0.0061)	(0.0153)	(0.0029)	(0.0093)
Fall 2019 cohort	0.1883***	0.2054***	0.0536***	0.0637***
	(0.0184)	(0.0242)	(0.0067)	(0.0141)
Fall 2020 cohort	0.1613***	0.1261***	0.0543***	0.0220
	(0.0176)	(0.0346)	(0.0083)	(0.0196)
Fall 2023 cohort	0.2409***	0.1136*	0.0827***	0.0040
	(0.0280)	(0.0476)	(0.0128)	(0.0263)
Fall 2024 cohort	0.2962***	0.1614***	0.1273***	0.0592*
	(0.0281)	(0.0466)	(0.0144)	(0.0268)

Note: All models include variables for student background characteristics. Standard errors are shown in parentheses. *** p<0.001, ** p<0.01, * p<0.05