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Improving College Access and Success through Dual Enrollment

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Key Takeaways

Historically, dual enrollment—which allows high school students to take college courses and earn college credit—has been accessible only to high-achieving students. State legislation aims to expand access to students who are underserved in higher education through the College and Career Access Pathways (CCAP) programs, launched in 2016 through Assembly Bill 288. We find that:

- **Overall and by race/ethnicity, CCAP students are doing better than non-dual enrollees before they enter college.** Nevertheless, the racial/ethnic disparities within the program persist across outcomes. Unlike other forms of dual enrollment, CCAP enrolls Latino students at rates that are representative of the high school population—but more work is needed to improve access for Black students.
- **Eighty-two percent of CCAP students enroll in college within one year of graduating from high school**—the state average for all high school graduates is 66 percent. Fifty-one percent of CCAP students enroll in a California Community College (CCC) and 31 percent enroll directly in a four-year college.
- **Transfer– or degree-intending CCAP students at CCCs complete gateway courses at higher rates than non-dual enrollees with the same goals.** Within one year of enrollment, 38 percent of CCAP students completed transfer-level math and 59 percent completed transfer-level English, compared with 23 percent and 42 percent, respectively, of non-dual enrollment students.
- **Average first-year GPA in CCC is much higher among CCAP students than non-dual enrollees**, but lower than peers from other forms of dual enrollment. A similar pattern holds for reaching key credit completion milestones.
- **CCAP students obtain associate degrees or certificates at higher rates than non-dual enrollees.** However, CCAP students are slightly less likely than students from other dual enrollment programs to complete these outcomes.

Colleges see opportunities—as well as challenges—in their efforts to expand CCAP. To improve college access and success among students, colleges should align CCAP courses to transfer and program pathways, strengthen supports for online courses, and ensure students are connected to wrap-around support services. CCAP is driving growth in dual enrollment, and it can be a strategy for achieving equity in college access, enrollment, and success.

Introduction

Dual enrollment, which allows high school students to take college courses and earn college credits, is an important way to expand educational opportunities, improve economic mobility, and meet California's workforce needs (Education Commission of the States 2019). However, historically it has been accessible only to high-achieving students taking advanced academic coursework (US Department of Education 2019).

Primarily driven by the College and Career Access Pathways (CCAP) programs established through Assembly Bill 288 (enacted on January 1, 2016), dual enrollment in California has been expanded to students who have been underserved, including those who are at risk of dropping out or who struggle academically. Recent investments by the state through K–16 collaboratives, the Golden State Pathways Program, and the inclusion of $100 million to expand CCAP programs in the 2022–23 state budget reflect the momentum behind dual enrollment as a strategy to improve the pipeline into and through college.

Additionally, Governor Newsom's multiyear compacts with the University of California (UC) and California State University (CSU), as well as his multiyear Roadmap with the California Community Colleges (CCC), spell out the importance of having the state's public colleges and universities collaborate to expand dual enrollment opportunities through CCCs. Specifically for the CCCs, the roadmap calls for a 15 percent increase in the number of high school graduates earning 12 or more college credits through dual enrollment.

Students gain an array of benefits from participating in dual enrollment in both high school and college: participation is associated with higher high school completion, college readiness, attendance, retention, and academic achievement (Berger et al. 2014; Edmunds et. al 2015). Dual enrollment students also enroll in college at higher rates and accumulate more credits, earn higher GPAs, and attain overall higher achievement in college (Allen and Dadgar 2012; An 2013; CLP and KCCD 2022; Giani et al. 2014; Struhl and Vargas 2012; Fink, Jenkins, and Yanagiura 2017; Ryu et al. 2023).

Dual enrollment students apply to more colleges and are more likely to apply to more-selective public four-year colleges (Liu, Minaya, and Xu 2022). In addition, the academic outcomes for dual enrollment students in career pathway programs improve, as do outcomes for students historically underserved by higher education (An 2013; Hooker et al. 2021; Rodriguez, Hughes, and Belfield 2012; Struhl and Vargas 2012).

The costs of dual enrollment can vary based on the location, instructor, and program. On the institutional side, the highest costs per credit are incurred when a college instructor teaches a dual enrollment course at a college campus, while the lowest costs occur with classes taught at a high school campus by a high school teacher (Belfield, Jenkins, and Fink 2023). On the student side, dual enrollment courses are typically low-cost or free—in California they are covered through state funding provided to high schools and colleges (LAO 2021).

College and Career Access Pathways programs have been especially effective at boosting the participation of students who are underserved in higher education (Rodriguez and Gao 2021; Kurlaender et. al. 2021). CCAP programs in particular enroll Latinos—the state's largest student group—at a rate that is representative of their share in the high school population. Latino CCAP students were also more likely to enroll in college within one year of graduating from high school, doing so at a community college at a higher rate (56% enroll at a two-year college, 23% enroll at four-year college). However, ensuring equitable representation of Black students in CCAP programs will demand more work. Even so, compared to all CCAP students, Black CCAP students are more likely to enroll in a four-year college (35%) and at rates similar to the overall dual enrollment population (37%) (see Rodriguez and Gao 2021).

Taken together, research suggests that if done intentionally and with equity in mind, dual enrollment can be a strategy that helps more students enroll in college, completing college faster and at a lower cost.

Data and methods

We use qualitative and quantitative data to examine the role of CCAP dual enrollment in strengthening pathways to completion and transfer for students that have been underrepresented among California's college graduates, including Black, Latino, and first-generation college students. Specifically, using Chancellor's Office Management Information System (MIS) student-level data from all 115 colleges,[1] this descriptive study explores medium-term college outcomes after AB 288 for the CCAP cohorts in the high school graduating classes of 2016 through 2020.[2]

By using student enrollment data through summer 2022 we can examine five cohorts of CCAP students at least three years after their participation in CCAP. The key outcomes we examine include enrollment and completion of gateway math and English courses, grade point average, reaching key milestones of earning course credits, and obtaining a certificate or degree at the community college. Next, we use interviews with college dual enrollment leaders at 13 colleges across the state to better understand the challenges and opportunities to using CCAP dual enrollment to strengthen the pathways into and through college for underserved students. Given the far-reaching effects of the pandemic on every aspect of life, including dual enrollment offerings, we use our interviews to investigate how the pandemic affected CCAP offerings and how the changes colleges made, specifically to online course offerings and supports, will be used moving forward. See Technical Appendix A for more details on data and methods.

CCAP and Dual Enrollment Growth

Despite ongoing concerns about declining enrollment at California's community colleges, rising dual enrollment has shown promise as a means to counter the trend. Indeed, in discussing the various ways their college benefits from participating in CCAP, all but one of the dual enrollment leaders we interviewed for this study identified increased enrollment as the top benefit (12 of 13 colleges).

Since the 2015–16 high school graduating class, the number of students participating in dual enrollment programs has steadily grown, reaching 103,784 in 2020, a rise of nearly 54 percent.[3] CCAP programs in particular have been the source of much of this growth. While other dual enrollment options (see text box) have had modest enrollment growth in recent years, participation in CCAP has taken off since the pathway was introduced in 2016.

1. While the CCC currently consists of 116 colleges, our research does not include Calbright, which does not offer credit courses.
2. These are the same cohorts identified in Rodriguez and Gao (2021). Differences in sample size across both studies reflect updates to the MIS data and the code used to track students across colleges.
3. The number of total dual enrollees in this study is about 10,000 lower than in Rodriguez and Gao (2021) due to changes in the STATA program code that was used to track students across institutions. Previously a student was counted twice if they took dual enrollment courses at more than one institution.

Dual enrollment programs in California high schools

Advanced Placement (AP). Created by the College Board, AP offers college-level curricula to high school students. To get college credit, students must pay for and successfully pass an examination for each course. California public colleges and universities award an extra point for AP courses when calculating admissions GPA. In 2018–19, nearly 90 percent of high school students were in schools that offer AP programs.

Dual Enrollment allows high school students to take college courses and earn college credits after successfully completing those courses. California public colleges and universities award an extra point for dual enrollment courses when calculating admissions GPA. In California, dual enrollment is structured in three ways:

- **College and Career Access Pathways (CCAP).**AB 288 authorizes a community college district to establish a College and Career Access Pathway partnership with a local K–12 district to expand dual enrollment opportunities to students who have been historically underserved by dual enrollment. With CCAP, courses can be offered on a high school campus and exclusively to high school students. In our sample, 83 colleges[4] offered dual enrollment as part of a CCAP, and 11 percent of dual enrollment students were in CCAP programs at some point.
- **Early College High School (ECHS) and Middle College High School (MCHS).**ECHS and MCHS programs are partnerships between high schools and a local community college, CSU, and/or UC that allows students to earn a high school diploma and up to two years of college credits in four years or less. These programs are whole school reforms and typically located on a college campus. Our sample includes 26 ECHS colleges and 17 MCHS colleges; 9 percent of dual enrollment students are in ECHS programs and 10 percent are in MCHS programs.
- **Other dual enrollment opportunities.**All community colleges (with the exception of Calbright, the system's online-only community college) offer other forms of dual enrollment where high school students take courses on the college campus, but with important differences in program structure, student population served, and student outcomes. Some colleges, such as Bakersfield, enter a formal partnership with individual schools or districts. In other cases, students take college-level courses independently. Seventy-three percent of students in our sample are served by these forms.

International Baccalaureate (IB). The IB Diploma Program is a two-year curriculum leading to an IB diploma. Students can earn college credits by paying for and passing IB exams. California public colleges and universities award an extra point for IB higher-level courses when calculating admissions GPA. Many colleges and universities recognize the IB exams for college credits and/or placement credit. In 2019–20, there were 115 IB programs in California.

The California Department of Education (CDE 2021) College and Career Indicator provides us a sense of how these acceleration strategies are contributing to college readiness. Between 2018 and 2020, about 14.8 percent of California high school graduates passed at least two AP tests with a score of 3 or better, 5.8 percent completed at least one year of dual enrollment coursework, and 0.8 percent passed at least two IB exams.

In this study, we group ECHS, MCHS, and other dual enrollment forms into a single category that we call "Other dual enrollment" or "Non-CCAP dual enrollment."

Source: Rodriguez and Gao (2021).

4. Unfortunately, we were only able to access the necessary college documents necessary to identify CCAP courses and students at 64 of the 83 colleges. The analysis of CCAP students and college outcomes are limited to the students who participated in CCAP at one or more of these 64 colleges.

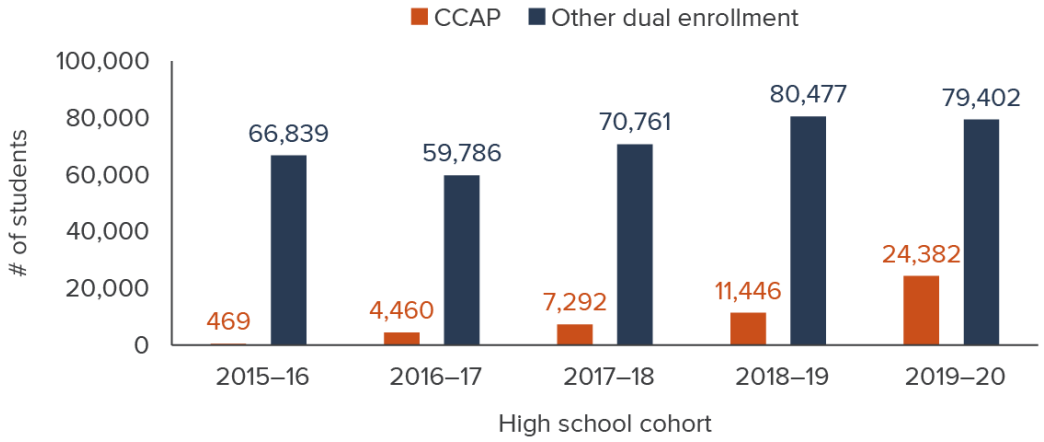
The number of students enrolling in a CCAP course rose more than fivefold, from just under 4,500 in 2016–17 during the first full year of implementation to almost 25,000 in 2019–20 (Figure 1). Although CCAP programs represent a relatively small share of total dual enrollment across all cohorts in our study, this share has been growing over time—representing just under a quarter (23.5%) in 2020 and contributing two-thirds (66%) of the increase in dual enrollment since 2016.

CCAP is driving growth because it helps address the logistical and cost concerns that may be present in other forms of dual enrollment:

- CCAP allows dual enrollment courses to be offered on high school campuses, open only to high school students, during the school day, and at no cost to students and their families.
- The Community College Research Center finds that dual enrollment structured like CCAP, especially when offered by high school instructors certified to teach college courses, can be delivered at a much lower cost per credit than a regular college class (Belfield, Jenkins, and Fink 2023).
- The funding structure is helping spur growth: in 2022–23, the state funded dual enrollment students at a higher rate ($6,788 per FTE) compared to the general CCC college population ($4,480 per FTE, additional performance-based funding may be earned.) (CCCCO 2023).

Figure 1

More students are participating in dual enrollment, especially CCAP programs



SOURCE: COMIS, 2012/13–2019/20; CCAP annual reports, 2016/17–2019/20 authors' scan of other official documents from colleges and high schools.
NOTES: Sample includes 405,019 high school students who graduated between 2015–16 and 2019–20. Those students took at least one dual enrollment course during their high school years (i.e., between 2012–13 and 2019–20). Dual enrollment status is based on "special admit" status. We do not have high school information for most of those "special admit" students, so we estimate their high school class based on the age at which they first took a dual enrollment course. We rely on California Department of Education student enrollment information, which is based on grade and age, to estimate time of graduation (assuming graduating within four years). AB 288 was signed into law in October 2015, and colleges and high schools started offering CCAP programs in spring 2016—albeit in small numbers. Most courses were inaugurated in the 2016–17 school year.

In addition to being the fastest growing dual enrollment option in the state, CCAP participation is relatively equitable (Figure 2; Technical Appendix B Table 2).

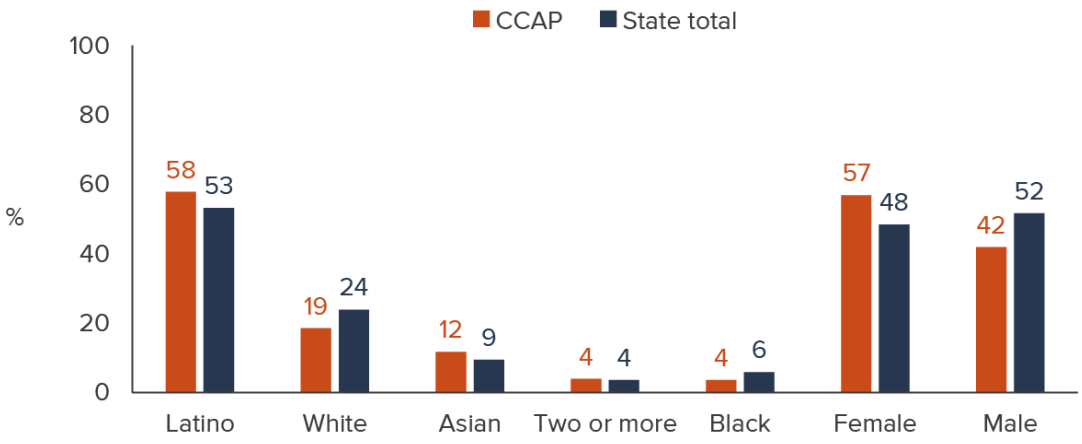
- Latino students comprise 53 percent of total grade 12 enrollment in California; among CCAP participants, the share of Latino students is five percentage points higher, at 58 percent.
- Asian students participate in CCAP in roughly equal proportions to their statewide enrollment, while Black and white students are underrepresented.
- Fifty-seven percent of CCAP students are female; male students are underrepresented.
- Forty-three percent of CCAP participants are first-generation college students.

Altogether, these data suggest more work is needed to ensure equitable representation for two key populations that are underrepresented in higher education—namely, Black and male students. Statewide, 37 percent of high schools with high shares of Black/Latino enrollment—schools where more than 75 percent of students are Black/Latino—offered dual enrollment (Rodriguez and Gao 2021).

Based on this low percentage of schools, underrepresentation could be improved by establishing new dual enrollment partnerships and engaging in intentional recruitment and enrollment efforts. The resources developed by EdTrust West as part of their Jumpstart series are geared toward supporting colleges in these efforts (Munoz et al. 2022).

Figure 2

Latino and Asian students are well represented in CCAP programs



SOURCE: Authors calculations using COMIS data for class of 2016 to class of 2020; California Department of Education, Grade 12 enrollment 2016–2020.

Community Colleges Are a Common Destination for CCAP Students

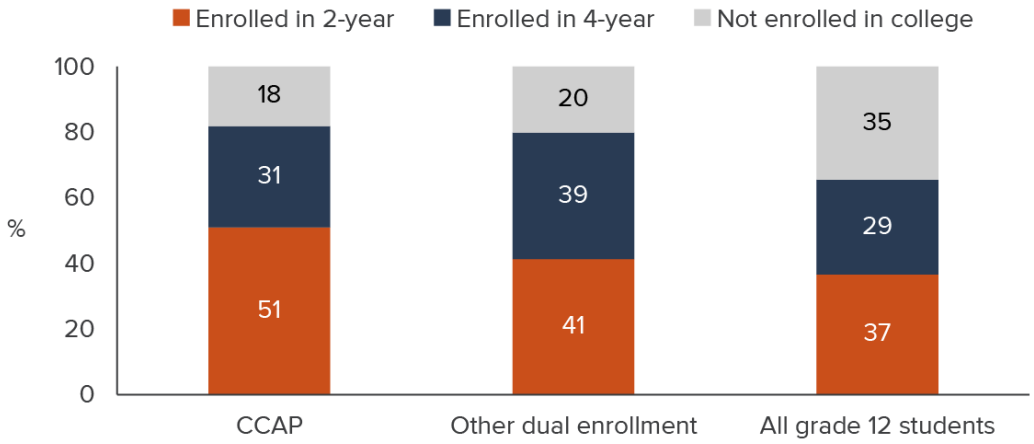
Among all CCAP cohorts in this study, 82 percent of CCAP students enrolled at a two- or four-year college within one year of graduating from high school. Just under a third enrolled directly at a four-year college, while just over half enrolled in the California Community College system (Figure 3).

Students in other dual enrollment programs enrolled in college at a similar rate (80%) but enrolled in a four-year college at a much higher rate (39% vs. 31%) and at a CCC at a much lower rate (41% vs. 51%). All dual enrollees enrolled in college at higher rates compared to the state average for high school graduates of 66 percent.

Furthermore, most of the CCAP students who matriculated in a CCC after high school graduation enrolled where they took their CCAP courses, suggesting that CCAP programs may be succeeding at recruiting CCAP students into their college after high school graduation. Our interviews with dual enrollment college leaders revealed that students may be motivated by the opportunity to enroll in the college to complete a program that they started while in high school. Familiarity with the college, its professors, as well as proximity are also contributing to this outcome.

Figure 3

Most CCAP students enroll in college, with over half enrolling in a California Community College



SOURCES: Authors' calculation using COMIS data matched to NSC data for dual enrollees. Statewide data with all high school graduates are from CDE College Going Rate using NSC data.
NOTE: Small differences in college-going rates presented in Rodriguez and Gao (2021) are a result of an updated sample of CCAP and other dual enrollees.

Nevertheless, where a student begins their college journey impacts the likelihood of completing a college degree—and starting in a four-year college improves the likelihood of completing a bachelor's degree.[5] Therefore, it may be an area of concern if CCAP students are directed to two-year instead of four-year colleges. Furthermore, low-income and underrepresented students are more likely to undermatch, or apply to less-selective schools, given their academic preparation (Smith, Pender, and Howell 2013). While a UC/CSU-prepared student may intentionally opt to begin college at a community college—due to other reasons like cost or the challenges associated with moving far from home—the likelihood of completion and transfer are significantly lower if they begin at a community college. It is important to understand the extent to which this might be happening and set up interventions to eliminate tracking students into two-year colleges.

5. The concern lies in the attrition problem that arises on the pathway from a CCC to a four-year university for students identifying a transfer goal. For example, the CSU reports that in 2021 about 63 percent of first-time students graduate with a bachelor's degree within six years, while only 28 percent of CCC students who identified a transfer goal transferred within six years (CSU 2022; Johnson and Cuellar Mejia 2020). This means that transfers would still need to spend additional time and money to complete their bachelor's degree. Among those who do manage to transfer, however, completion rates are relatively high—with 80 percent completing a bachelor's degree within four years (CSU 2022).

CCAP Students and Community College Success

Students view gaining a head start on a certificate, degree, or transfer, and earning free college credits as among the top benefits of participating in CCAP, according to our interviews with dual enrollment leaders. Our analysis confirms students reap the benefits of CCAP participation, as shown by their outcomes on key milestones, but there are opportunities for improvement. In this section, we use longitudinal student data from the Chancellor's Office to examine former CCAP students' experience and trajectories after they enroll in the California Community College system.

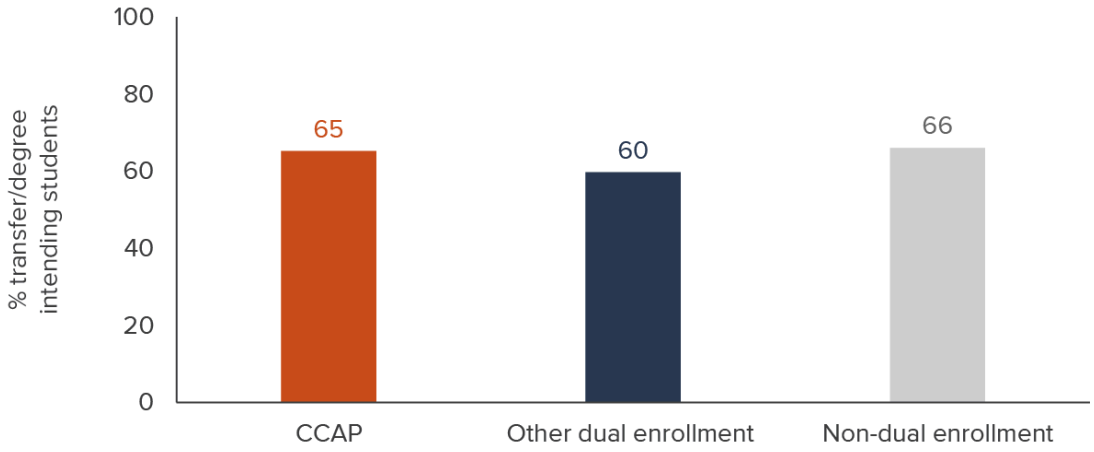
Most CCAP Students Have Degree or Transfer Goals

About two-thirds of CCAP students who enroll at community colleges express a desire to accumulate enough credits to complete an associate degree or transfer to a bachelor's degree program at a four-year university (Figure 4). Since the inception of CCAP, the share of students stating an intention to complete a degree or transfer has risen as the program has expanded. Rates are higher for CCAP students compared to students in other types of dual enrollment, and roughly the same for students who never participated in dual enrollment programs.

While we might expect higher shares with degree or transfer goals for students in other dual enrollment programs, compared to the non-dual enrollees, these findings may suggest an interesting pattern. Namely, other dual enrollment programs—which include ECHS, MCHS, and traditional DE—may be doing a slightly better job at matching students to the college that better aligns with their prior academics and goals. That is, while more non-CCAP dual enrollees are going directly to a four-year college (see Figure 3, earlier), the ones who do enter the CCC are more likely to be there because their goal is to complete an associate degree or because they only needed a few courses to complete their transfer requirements.

Figure 4

CCAP students intend to transfer to a four-year university or get an associate degree at a similar rate to non-dual enrollees



SOURCE: Authors' calculation using COMIS data.
NOTES: Sample restricted to high school graduating cohorts between 2016 and 2020 who enrolled in a credit course at a CCC within one year of graduating from high school. The sample includes 25,084 former CCAP students, 188,337 students in other dual enrollment modalities, and 1,330,227 first-time college students who did not participate in any dual enrollment programs. Differences are statistically significant. See Technical Appendix for data by cohort.

Higher Shares of CCAP Students Reach Transfer or Degree Milestones

When students complete gateway courses, they stay on track to progress through community college and transfer to a bachelor's program (Cuellar Mejia et al. 2023; Johnson and Cuellar Mejia 2020; Cooper et al. 2022). After matriculating as degree- or transfer-intending CCC students, former CCAP students complete transfer-level math and/or English courses at higher rates than students from other dual enrollment programs or those who did not participate in dual enrollment (Figure 5).

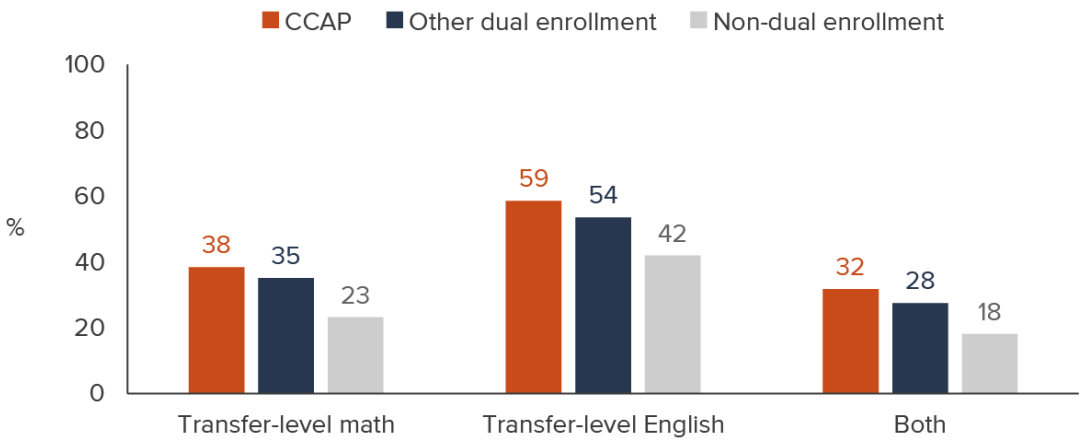
Among students with degree or transfer goals, 38 percent of former CCAP students completed transfer-level math, and 59 percent completed transfer-level English within one year of entering college. By comparison, 23 percent of non-dual enrollment students completed transfer-level math, and 42 percent completed English within this timeframe. A similar pattern holds for students from other dual enrollment programs, albeit the gaps are smaller.

Our interviews with college leaders found that at institutions that intentionally created a dual enrollment pathway to boost completion of Intersegmental General Education Transfer Curriculum (IGETC)[6] requirements or whose Promise Programs[7] set completion of math and English gateway courses as a key milestone, students were more likely to achieve this outcome.

6. The Intersegmental General Education Transfer Curriculum–also known as IGETC—is a comprehensive set of courses that community college students can take to satisfy lower-division, general education requirements at both the UC and CSU.
7. Promise Programs incentivize college enrollment and completion by offering financial, academic, or other support services.

Figure 5

Higher shares of CCAP transfer/degree-seeking students complete gateway courses within one year



SOURCE: Authors' calculation using COMIS data.
NOTES: The full sample includes 25,084 former CCAP students, 188,337 students in other dual enrollment modalities, and 1,330,227 first-time college students enrolled in community colleges after high school. For this outcome the full sample is restricted to the subset of students that took credit courses and stated they want to obtain an associate degree and transfer to a four-year institution, transfer to a four-year institution without an associate degree, or obtain a two-year associate degree without transfer (see Figure 4). This outcome includes courses taken while in CCAP and other dual enrollment programs. Differences between modalities are statistically significant for each of the milestones.

Another key milestone on the path toward degree completion and transfer is the progress students make toward completing 60 credits. The 60-credit milestone is important because it is the minimum number of credits a student must complete to earn an associate degree and to qualify to be an upper-division transfer to a four-year university. We measure two intermediate metrics on the pathway to 60 credits within three years: completion of 30 credits within 18 months and completion of 45 credits within two years. CCAP students reach the first checkpoint on this path at relatively high rates.

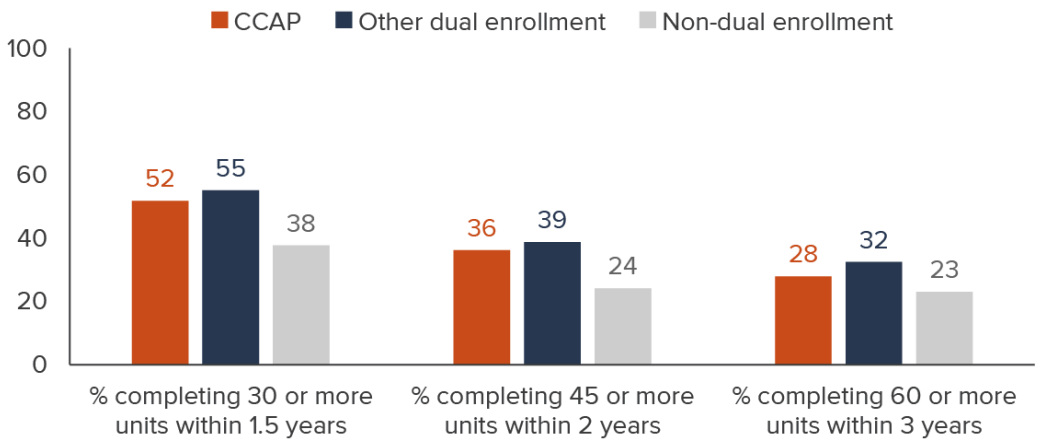
About 52 percent of students earn 30 credits in their first 18 months (Figure 6). This rate is higher than non-dual enrollees (38%), but lower than students in other dual enrollment programs (55%). A similar pattern holds for the other credit milestones across the groups. Twenty-eight percent of CCAP students reached the 60-credit milestone within three years, compared to 32 percent of other dual enrollees, and 22 percent of non-dual enrollment students.

We argue that the stronger findings for students in other dual enrollment programs may reflect the setup of the programs and the types of students they serve. For example, one goal of ECHS and MCHS programs is to help students accumulate up to 60 college credits by the time they graduate from high school. ECHS and some MCHS programs also have an application process, and students are selected based on prior academic achievement. These programs also have more structured and robust student supports.

Furthermore, students who independently access dual enrollment generally have been higher achieving. CCAPs, on the other hand, were designed to serve a broader and more diverse group of students, including those who may not already be on a college pathway (see Rodriguez and Gao 2021).

Figure 6

Around half of CCAP transfer/degree-intending students complete 30 or more credits within 18 months



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Grades for CCAP Students Have Room to Improve

While completed credits determine whether a student earns a degree and transfers, grades are equally as important. Looking at performance in the first year of college, we find that the average GPA is higher among CCAP students than non-dual enrollment students, but lower than other dual enrollment students (Figure 7). However, GPAs for CCAP students have risen in recent cohorts: for students in the high school graduating class of 2020, average GPAs are up to 2.69, compared to 2.41 for the class of 2016.

Course load and mix may be affecting the first-year GPAs for the two groups. But promoting academic and nonacademic supports available at the college while CCAP students are still in high school may help direct students towards available services to help them succeed after they enroll in college.

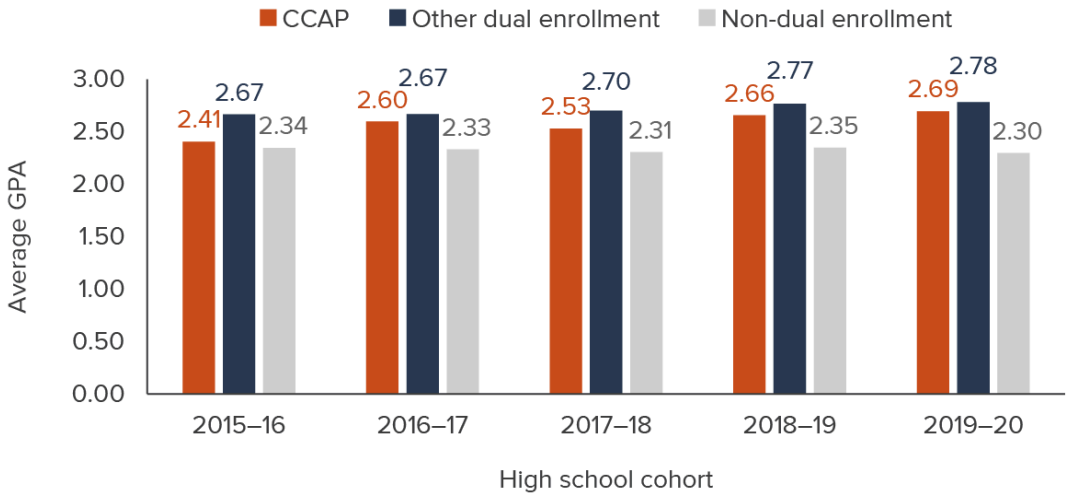
While the research on the effectiveness of corequisites—a model where students receive additional academic support while enrolled in the gateway math and English course—is mixed, insights from CCC math and English corequisite faculty may shed light on key factors that support course success (Cuellar Mejia et al. 2020). In successful corequisite courses, CCC practitioners noted helpful strategies such as requiring students to use tutoring or the writing center (in-person or online) for course assignments, and embedding "scavenger hunt" activities into assignments, where students visit and learn about the counseling and financial aid office, the library, tutoring center, or basic needs center.

Another helpful strategy involves embedding modules into the course to address the affective domain; for example, to support students with issues related to math anxiety or lack of academic confidence (Hern and

Snell 2013). Finally, to address logistical concerns around embedding these activities within dual enrollment programs, high schools could make field trips to the college campus or use online services and supports.

Figure 7

First-year GPA for CCAP transfer/degree-intending students has improved



SOURCE: Authors' calculation using COMIS data,
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A Higher, but Relatively Small Share of CCAP Students Earn Degrees

Students from CCAP and other dual enrollment programs obtain credit awards (e.g., associate degrees or certificates) at higher rates than non-dual enrollees (Figure 8). However, CCAP students are slightly less likely to complete this outcome than other dual enrollment students. This pattern holds when we examine the outcomes within one, two, and three years of enrolling in college.

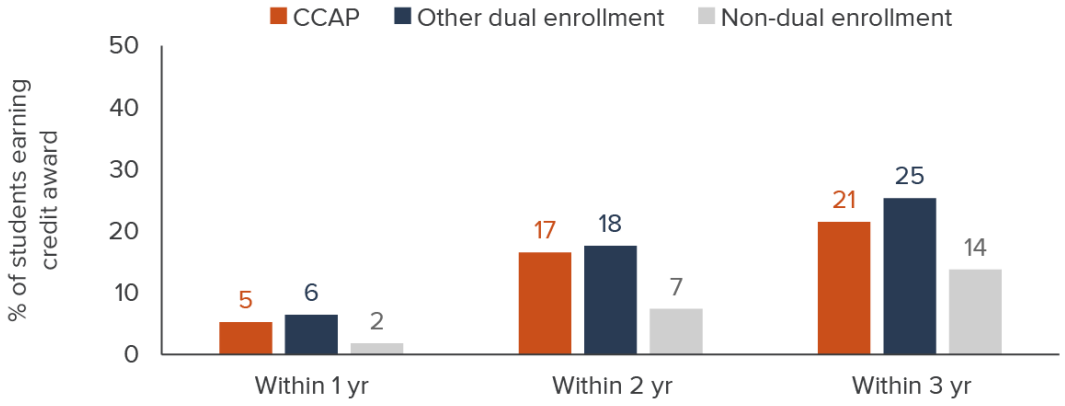
After three years, nearly 21 percent of CCAP students completed a credit award, compared to nearly 25 percent of other dual enrollees, and about 14 percent of non-dual enrollees. Other dual enrollees may have an advantage over CCAP students given selection factors that we cannot account for due to data limitations (e.g., prior academic achievement) and unobservable characteristics (e.g., motivation). Recall that the CCAP program aims to broaden dual enrollment opportunities to students not already on the college pathway or who are underrepresented in higher education. Meanwhile, ECHS and MCHS students apply and are selected to participate based on prior academic achievement, among other factors. The traditional dual enrollees who take dual enrollment courses on their own are typically higher achieving and more motivated.

One important thing to note with this outcome is that a higher share of students across all groups are completing 60 credits within three years than are completing a certificate or degree (28% vs. 21%, respectively, for CCAP students). While we might expect that all students who complete the minimum

number of credits required for an associate degree or certificate would earn one, this is not always the case. Recent research examining the trajectories of students who successfully transferred finds that 35 percent of this group transferred without an associate degree. They also find that over the last few years, an increasing number of transfer students had a prior dual enrollment experience (Cuellar Mejia et al. 2023). Taken together, these findings suggest that as CCAP partnerships continue to grow and develop, improving the programs to ensure students leave college or transfer with a credit award is an important area for improvement.

Figure 8

Transfer/degree-intending CCAP students complete credit awards more often than non-dual enrollment students



SOURCE: Authors' calculation using COMIS data.
NOTES: The full sample includes 25,084 former CCAP students, 188,337 students in other dual enrollment modalities, and 1,330,227 first-time college students enrolled in community colleges after high school. For this outcome the full sample is restricted to the subset of students that took credit courses and stated they want to obtain an associate degree and transfer to a four-year institution, transfer to a four-year institution without an associate degree, or obtain a two-year associate degree without transfer (see Figure 4). This outcome includes credits taken while in CCAP and other dual enrollment programs. Differences are statistically significant between enrollment modalities for each of the milestones.

Outcomes Reflect Racial Inequity among Some CCAP Groups

We next explore how CCAP students in different racial/ethnic groups perform within the program and compare to their peers in other dual enrollment programs and non-dual enrollees. Each comparison tells a different but important story of the benefits of participating in CCAP.

Gateway course completion

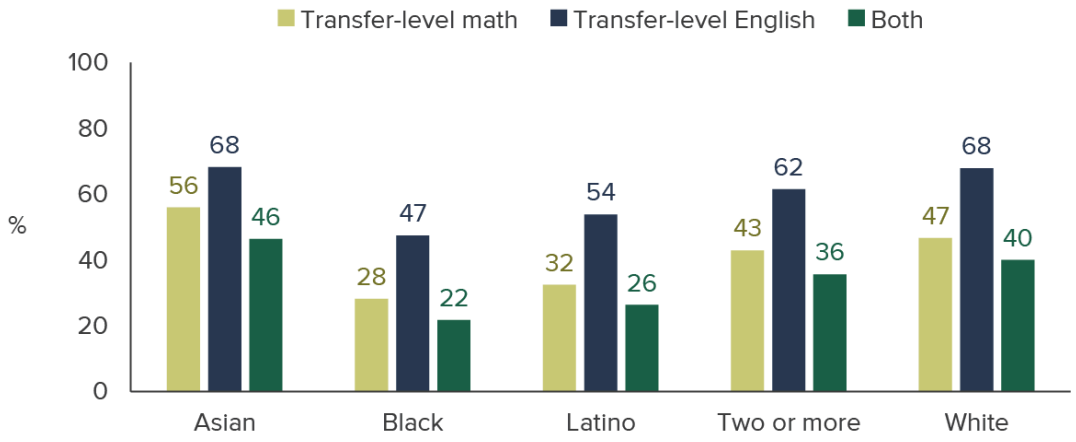
CCAP programs enroll an equitable share of Latino students in high schools; however, much work remains to close the success gaps within and across the program. Black and Latino CCAP students complete transfer-level math/English courses at lower rates than Asian or white CCAP students (Figure 9).

- In transfer-level English, 47 percent of Black students and 54 percent of Latino CCAP students completed a course, compared to 68 percent of Asian and white students.
- In transfer-level math, 28 percent of Black students and 32 percent of Latino students completed a course compared to 47 percent of white students and 56 percent of Asian students.

Overall, however, Black and Latino CCAP students complete transfer-level math/English within one year at higher rates than their counterparts in other dual enrollment programs and non-dual enrollees (Technical Appendix B, Table 11).

Figure 9

Black and Latino CCAP students completed transfer-level courses at lower rates than Asian or white students



SOURCE: Authors' calculation using COMIS data,
NOTES: The full sample includes 25,084 former CCAP students, 188,337 students in other dual enrollment modalities, and 1,330,227 first-time college students enrolled in community colleges after high school. For this outcome the full sample is restricted to the subset of students that took credit courses and stated they want to obtain an associate degree and transfer to a four-year institution, transfer to a four-year institution without an associate degree, or obtain a two-year associate degree without transfer (see Figure 4). This outcome includes credits taken while in CCAP and other dual enrollment programs. Differences are statistically significant between races for each of the milestones, except for Asian and white for English and white and two or more for math.

College credit milestones and GPA

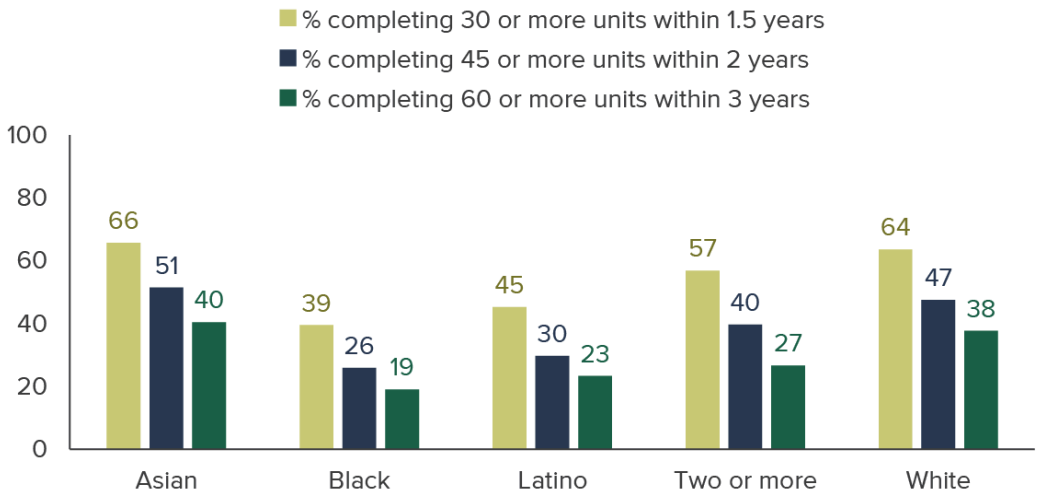
We see similar racial/ethnic disparities in the completion of 30/45/60 credits among CCAP students.

- About 66 percent of Asian or white students completed at least 30 credits within 18 months, compared to 45 percent of Latino students and 39 percent of Black students (Figure 10).
- Within three years, 38 percent of white students and 40 percent of Asian students completed 60 or more credits, compared to 23 percent of Latino students and less than 20 percent of Black students.

Black and Latino CCAP students achieve these credit milestones at higher rates than non-dual enrollees, but at lower rates than peers from other dual enrollment programs (Technical Appendix B, Table 12).

Figure 10

Black and Latino CCAP students complete credit milestones at lower rates

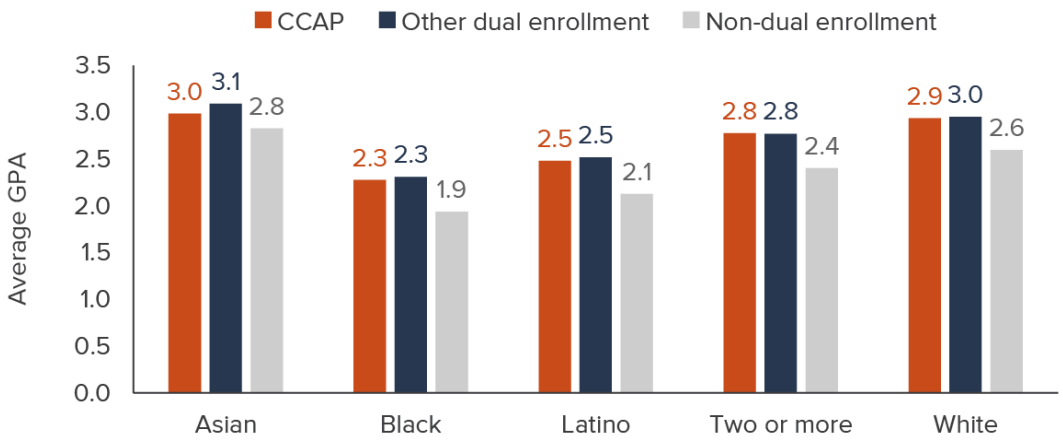


SOURCE: Authors' calculation using COMIS data.
NOTES: The full sample includes 25,084 former CCAP students, 188,337 students in other dual enrollment modalities, and 1,330,227 first-time college students enrolled in community colleges after high school. For this outcome the full sample is restricted to the subset of students that took credit courses and stated they want to obtain an associate degree and transfer to a four-year institution, transfer to a four-year institution without an associate degree, or obtain a two-year associate degree without transfer (see Figure 4). This outcome includes credits taken while in CCAP and other dual enrollment programs. Differences between races are statistically significant for each credit milestone category, except for Asians and white in percent completing 30 or more credits within 1.5 years, and between Black and Latino completing 45 and 60 or more credits within 2 and 3 years, respectively.

First-year GPA follows a similar pattern, wherein white students have an average GPA of 2.9, Latino students, an average of 2.5, and Black students an average of 2.3. Nevertheless, the GPA for Latino and Black CCAP students is consistently higher than that of their non-dual enrollment peers (Figure 11).

Figure 11

CCAP Black and Latino students have higher GPAs than non-dual enrollees in the first year



SOURCE: Authors' calculation using COMIS data.
NOTES: The full sample includes 25,084 former CCAP students, 188,337 students in other dual enrollment modalities, and 1,330,227 first-time college students enrolled in community colleges after high school. For this outcome the full sample is restricted to the subset of students that took credit courses and stated they want to obtain an associate degree and transfer to a four-year institution, transfer to a four-year institution without an associate degree, or obtain a two-year associate degree without transfer (see Figure 4). This outcome includes credits taken while in CCAP and other dual enrollment programs. Differences between races for each modality are statistically significant, except for Asian and white CCAP students.

Degree completion

We see disparities in certificate and degree completion within three years among CCAP students. Within CCAP, about 29 percent of Asian students, 19 percent of Latino students, and 14 percent of Black students completed within three years (Figure 12). Across programs, all other dual enrollees complete at higher rates than CCAP, but with similar racial/ethnic patterns. Nevertheless, Latino and Black CCAP students do considerably better than non-dual enrollee peers in terms of completing a certificate or degree:

- Within three years, 19 percent of Latino CCAP students complete a certificate or degree compared to 12 percent of non-dual enrollees.
- Within three years, 14 percent of Black CCAP students complete a certificate or degree versus 8 percent of non-dual enrollees.

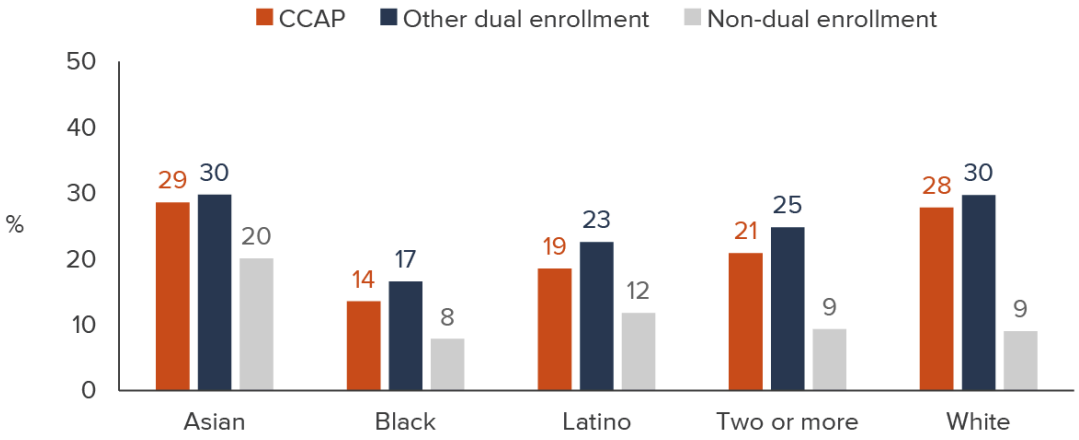
Here, we want to flag that higher shares of students completed the 60-credit milestone than completed a credit award within three years (Figure 13)—for example, 23 percent of Latino CCAP students completed 60 credits within three years, but only 19 percent completed a credit award within this timeframe. As noted previously, this is not surprising given that some students transfer without a degree, but it does suggest more could be done to understand why this happens and ensure that more students completing this key milestone are completing a degree.

These racial gaps may reflect an inequitable access to educational opportunities—such as quality K–12 education and college preparation, counseling, and wrap-around supports. Most notably, in high schools that offer CCAP, lower shares of graduates complete the A–G requirements; furthermore, math and English proficiency rates are lower compared to schools offering ECHS and MCHS (Rodriguez and Gao 2021).

Key selection factors, such as prior academic achievement, family socio-economic status, student motivation, and other factors that are not observed by researchers, often determine access to and outcomes in dual enrollment courses and may also be driving the disparities in outcomes. For dual enrollment leaders, programming that helps counter the challenges posed by these selection factors, such as targeting supports to underserved students to help them navigate college life and complete college goals, was considered especially important.

Figure 12

Black and Latino CCAP students complete credit awards within three years at lower rates than other dual enrollees, but higher rates than non-dual enrollment students



SOURCE: Authors' calculation using COMIS data.
NOTES: Full sample includes 23,570 former CCAP students, 180,463 students in other dual enrollment modalities, and 1,252,783 first-time college students enrolled in community colleges after high school. For this outcome, the full sample is restricted to the subset of students that took credit courses and stated they want to obtain an associate degree and transfer to a four-year institution, transfer to a four-year institution without an associate degree, or obtain a two-year associate degree without transfer (see Figure 4). This outcome includes credits taken while in CCAP and other dual enrollment programs. Differences between races for each modality are statistically significant, except for Asian and white (CCAP and other dual enrollment), and Latino and two or more (CCAP). Differences within races are statistically significant, except for Asian (CCAP and other dual enrollment) and Black students (CCAP and other dual enrollment).

Completion Is Lower for First-Generation College Students

Among the group of CCAP students who enroll in community colleges after finishing high school, 43 percent are first-generation college students—or students with parents and/or guardians without a college degree (see Technical Appendix B). This compares to 37 percent among students who participated in other dual enrollment programs and 44 percent among those who had no prior dual enrollment experience. In terms of goals, 69 percent of CCAP, 66 percent of other dual enrollment programs, and 71 percent of non-dual enrollment first-generation students are transfer/degree-seeking students. Achievement among first-generation CCAP students is also lower than other groups:

- First-generation CCAP students complete transfer-level English and math at lower rates than non-first-generation students (26% vs. 40%, CCAP; 23% vs. 34%, other dual enrollees; and 15% vs. 24%, non-dual enrollees).
- First-generation CCAP students are less likely to earn a credit award within three years than non-first-

generation students (19% vs. 27%), other dual enrollees (22% vs. 29%), and non-dual enrollment students (12% vs. 17%).

- A similar pattern occurs with completing 30/45/60 credits within three years of enrollment (24% vs. 37%, CCAP; 28% vs. 38%, other dual enrollees; and 19% vs. 29%, non-dual enrollees).
- GPA for transfer/degree-intending students within one year of enrollment is lower for first-generation students than non-first-generation students (2.48 vs. 2.87, CCAP; 2.54 vs. 2.94, other dual enrollees; and 2.15 vs. 2.58, non-dual enrollees).

Male Students Are Underrepresented in Dual Enrollment

Male students are underrepresented in CCAP programs and tend to have worse academic outcomes than female students (see Technical Appendix B). Female students represent 57 percent of those enrolled in CCAP courses during high school, and 57 percent of those enrolled in other dual enrollment programs. Fifty-eight percent of CCAP students who enroll in community colleges after finishing high school are female, compared to 56 percent of the students in other dual enrollment programs and 50 percent for non-dual enrollment students.

Looking at goals, differences between genders are minimal. Around 65 percent of CCAP male and female students are transfer/degree-seeking students; in other dual enrollment programs, 60 percent of male and female students are seeking transfer or a degree. Among non-dual enrollment students, close to two-thirds of both genders are transfer- or degree-seeking.

Within this transfer/degree-seeking group, female students see stronger outcomes than male students:

- Female CCAP students complete transfer-level English and math courses at higher rates than male students (32.5% vs. 30.8%, CCAP; 28.2% vs. 26.7%, other dual enrollees; and 18.9% vs. 17.2%, non-dual enrollees).
- Female CCAP students earn more credit awards within one year of enrollment than male students (5.7% vs.4.5%, CCAP; 7.3% vs. 5.3%, other dual enrollees; and 2.1% vs. 1.5%, non-dual enrollees).

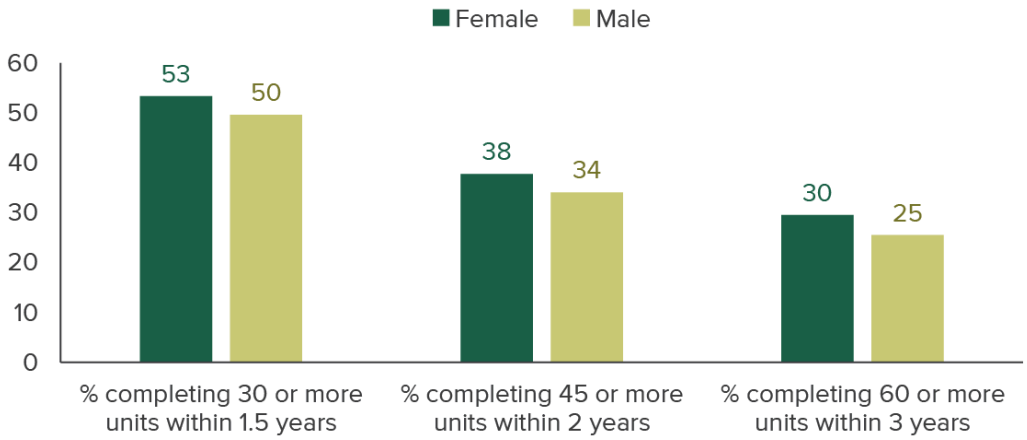
Results are similar for completing 30/45/60 credits within one and a half years, two years, and three years of enrollment, respectively, where female students complete more credits than male students in each program (Figure 13 shows the results for CCAP students).

- GPA for transfer/degree-intending students within one year of enrollment is higher for female students than male students (2.70 vs. 2.56, CCAP; 2.78 vs. 2.63, other dual enrollees; and 2.41 vs. 2.24, non-dual enrollees).

When we examine the intersection of race and gender, similar patterns hold. Namely, Black (60%), Latina (60%), and Asian (55%) females are overrepresented in CCAP and other dual enrollment programs and among dual enrollees who subsequently enroll in community college. With few exceptions, across the various community college outcomes we examined we find a consistent pattern where females across races achieve higher outcomes than their male peers. For example, 28.5 percent for CCAP Latino males who complete 30 credits within 1.5 years of enrollment, compared to 32 percent for Latina females (see Technical Appendix B).

Figure 13

CCAP female students complete more credits than male students



SOURCE: Authors' calculation using COMIS data.
NOTES: The full sample includes 25,084 former CCAP students enrolled in community colleges after high school. For this outcome the full sample is restricted to the subset of students that took credit courses and stated they want to obtain an associate degree and transfer to a four-year institution, transfer to a four-year institution without an associate degree, or obtain a two-year associate degree without transfer. This outcome includes credits taken while in CCAP and other dual enrollment programs. Differences are statistically significant between gender for each milestone.

From CCAP to College Access and Success

CCAP students are doing better—overall and by race/ethnicity—than peers who did not participate in dual enrollment before entering a California community college. Nevertheless, the racial/ethnic disparities within the program persist across outcomes, suggesting opportunities where the CCAP programming and structures might help strengthen later college outcomes.

In this section we present findings from our interviews with college dual enrollment leaders to delve deeper into the elements of CCAP that promote college access, student success, and equity, and explore challenges and opportunities that lie ahead.

Using CCAP to Gain College Knowledge and Navigational Skills

Programs that aim to broaden access to dual enrollment to underserved student groups have used college success courses (see Rodriguez et al. 2012), which bundle academic, behavioral, and personal supports within the same transferrable course. Such courses could be an effective way to include underserved students in dual enrollment by helping them learn about college expectations and by making them aware of the supports available to help them succeed in college.

Our interviewees shared that college success courses that help CCAP students acquire college knowledge and navigational skills support students in dual enrollment and in college. Indeed, one college with the strongest college outcomes for former CCAP students indicated that offering a college success course as part of their dual enrollment experience was perceived to be a key to success.

In college success courses, students can develop skills ranging from time management and study skills to health and wellness and career/major exploration and planning. The courses typically help students understand college policies and campus resources. One challenge, however, is that success courses are not A–G approved at some institutions or transferrable to UC and CSU. Additionally, if the courses are exclusively taught at a high school campus by high school instructors certified to teach college courses, there may also be concerns that the rigor and quality of the college-level course may not be maintained.

Moving forward, aligning these courses with UC and CSU expectations and monitoring the rigor and quality of the courses can ensure they support student success while maintaining student demand.[8] Equally important will be to use linked K–12 and postsecondary data to conduct research on the effectiveness of the courses in improving the pathways into and through higher education.

Accessing Support at Both the High School and College

CCAP and other dual enrollment students have access to both high school and college supports and services to help boost their likelihood of success. This includes college academic and career counseling, tutoring, library services, basic needs supports, services for students with disabilities, and others. Through our interviews with dual enrollment leaders at community colleges, however, we learned that these dual supports are likely the greatest untapped potential of CCAP (and dual enrollment more broadly).

Our interviewees noted that because CCAP courses were held at the high school campus, students had greater familiarity with the services and supports offered through their high school. Several dual enrollment college leaders shared that, with more concerted efforts from the college, CCAP students could visit the college on field trips to learn about and explore campus-based services and supports.

The advent of online supports and services—which expanded greatly during the COVID-19 pandemic—were considered a great step forward, as these options help eliminate some logistical challenges. Access to college supports seemed to be a selling point of the dual enrollment programs, but our interviews and our current analysis of outcomes suggest that more work is needed to fully realize their potential.

Coordinating and Aligning between High School and College

Coordination challenges between high school and college, especially around the type of courses to be offered, can limit college access and success. This challenge is not unique to CCAP programs: in our prior research, participants overseeing other structured dual enrollment programs indicated this obstacle was common (Rodriguez and Gao 2021).

High schools usually decide the types of college acceleration programs to offer, and sometimes tension occurs between AP programs and dual enrollment programs. Given the role AP courses historically played in college admission, AP courses have continued to expand: statewide, 39 percent of the high school

8. In an effort to streamline transfer requirements to the CSU and UC, the list of lower-division requirements necessary to transfer is undergoing revisions with the goal of having one single set of requirements for both systems. Under the current proposals, CSU Area E, or “life-long learning and self-development”, which is where college success courses fall under, would be eliminated because this area is not a UC requirement. Students could still take the course, but if transferrable, it would only obtain elective credit. See AB 928 Committee website and EdSource coverage of AB 928 for more information.

graduating class of 2022 took at least one AP exam, with 27 percent of the class of 2022 scoring a 3 or higher (College Board 2022).

High schools may consider using dual enrollment to promote better access to college level courses, especially for students who are considering public colleges. In addition, high schools may coordinate with local colleges to ensure better alignment of program of study and pathways.

A dual enrollment leader at a college with lower-than-average college outcomes shed light on some of the barriers to greater alignment. For example, high schools request dual enrollment course offerings, but many career-focused courses may not build toward a program of study (although exceptions exist). Tension arose between the college wanting to meet the needs and demands of the high school partner and its desire to create a pathway into a program of study. Even when a high school requested courses intending to align them with a career pathway, there was no consistency in course offerings across the district because different schools make the requests. This lack of consistency affects the college's ability to use CCAP courses as a recruitment tool into college programs because, with few exceptions, career-focused dual enrollment tended to be one-off courses.

The college administrator overseeing dual enrollment at this college noted that they would like to figure out how to strategically "maximize the pathways from high school to college." Given our current and prior analysis, we would urge prioritizing pathways into high-wage and high-mobility careers colleges. If colleges are able to align with their K–12 partners in this way, the stronger outcomes we found for CCAP (and other dual enrollment) would likely see a notable boost.

Offering Courses that Give Students Credit across Segments

Across most interviewees, transferrable general education (GE) courses were perceived as the most valuable offering for students and the best strategy to promote college access and success. While not all CCAP students will decide to attend community college—in fact, just under one-third of CCAP students go directly to a four-year university—offering courses that will be accepted at other postsecondary institutions, especially four-year universities, is critical.

One college shared that they focused on offering GE courses that clearly did not conflict with high school classes (e.g., anthropology, sociology, English as film) due to a perception that they could not offer courses like English because those courses might conflict or compete with the high school English course. However, several other leaders indicated that they devoted significant efforts to providing gateway English and/or math courses as part of their CCAP program. This finding highlights an opportunity for the system office to improve clarity on the type of GE course offerings that colleges can offer through dual enrollment.

The biggest challenge with offering more transferrable GE courses involves having sufficient instructors with the minimum qualifications to teach these courses (see Rodriguez and Gao (2021) for more). Programs in the Central Valley are addressing these challenges through regional collaborations or college-level efforts—one such approach supported by the Central Valley Higher Education Consortium is facilitating the upskilling of high school teachers so they earn their master's degrees in the discipline. One college in the Central Valley will be addressing this challenge by hiring instructors specifically to teach dual enrollment math and English at the high schools.

Connecting Students to the College's Student Success Program

Connecting former CCAP students to the college's student success program may be key to boosting outcomes after they are in college. At one college with the strongest college outcomes—including the highest rate of gateway math completion—CCAP students likely benefited from the college's intense efforts to recruit new, first-time, full-time students into their "Promise Program."

As part of the Promise Program, students enroll in college as a cohort, receive the first two years of college free (including tuition, fees, textbooks), are assigned a success coach, and receive wrap-around services. Students participating in the program must also enroll in gateway math and English in their first semester, and complete both by the end of the first year. To continue in the program in year two, the students must also meet with their counselor once a semester, complete the FAFSA or CADAA, earn at least 24 credits by the end of their first year, and earn a minimum 2.0 GPA.

The college is also embracing the Guided Pathways approach, and asks students to select a learning pathway after they are admitted to the Promise Program. The college is currently working on expanding the model to serve students who enroll part-time.

While at least one college with lower-than-average CCAP college outcomes also offered a similar student success program option, the college did not appear to be as strictly structured around key milestones and behaviors (e.g., English and math "in the semester needed" versus "enroll and complete in the first year"), which could be affecting college outcomes.

Our analysis of college outcomes suggests more could be done to ensure these types of student success programs are reaching Black, Latino, male, and first-generation college students. Programs must incentivize key milestones to completion and transfer by making them a requirement of the program (e.g., complete transfer-level math and English within the first year, complete 30/60 credits within one and two years, maintain the GPA needed for completion of degree/transfer, complete FAFSA/CADAA) and by providing the wrap-around supports necessary to help students meet these goals.

Using CCAP as an enrollment and equity strategy

Should colleges approach dual enrollment as an enrollment strategy or an equity strategy? Our research suggests that CCAP presents colleges with an important opportunity to view these as complementary and not opposing goals.

First, analysis of CCAP student enrollment reveals that CCAP has been the main driver of the growth of dual enrollment—and unlike other forms of dual enrollment, CCAP enrolls equitable shares of Latino students in the program (Rodriguez and Gao 2021).

Second, it was clear from our inquiries that merging a funding formula that incentivizes enrollment growth with a policy targeting underserved populations can direct efforts toward improving equitable access to dual enrollment. Virtually all college officials we interviewed expressed that their college benefits from participating in CCAP through increased enrollment. In fact, one college in the San Joaquin Valley noted that dual enrollment has brought the college significant full-time equivalent enrollments (FTEs) and comprises about 20 percent of the college's enrollment.

When dual enrollment leaders spoke about the benefits of CCAP for students, the top three that emerged included the ability to earn free college credits, gain college knowledge, and get a head start on achieving their desired certificate, degree, or transfer goals. CCAP leaders also perceived that the early college experience gave students the opportunity to see themselves as college students, which improves college aspirations and builds self-esteem and confidence.

The Pandemic Offered a Few Silver Linings

While the pandemic brought with it devastating consequences, much can be learned from some unexpected benefits that emerged as well.

Online courses are here to stay

Overall, 11 out of the 13 colleges we interviewed indicated that they plan to continue offering online or hybrid CCAP courses post pandemic. Across these institutions there was consensus that online or hybrid dual enrollment courses improve access for students, especially those who might have scheduling conflicts with work or extracurricular activities, or in cases where it is challenging to get an instructor to teach the course.

The two colleges that did not say they would offer online dual enrollment courses indicated that they would if they could, but that their interpretation of AB 288 was that CCAP courses could not be offered asynchronously online. In fact, the interviewee at one of these colleges, and at least four others, indicated that a recent Chancellor's Office webinar raised some concerns by suggesting that all CCAP courses were required to be in-person moving forward.

Part of the confusion lies in the fact that, technically, a student can take asynchronous courses anywhere and at any time. Therefore, these courses do not meet two key requirements for CCAP courses: that they be offered at a high school campus and during the regular school day. However, the Chancellor's Office has

confirmed that the asynchronous online course can be open to only high school students and offered via a CCAP agreement if it meets certain requirements.[9]

Given that online courses are here to stay for the general college population, and that most of the dual enrollment leaders we interviewed indicated that they would like to continue to offer them, proper use of online asynchronous courses needs to be clarified—the Chancellor's Office is working to provide greater clarity on this matter.

Supporting online courses with high school facilitators

Success rates for online courses before the pandemic are generally lower compared to face-to-face courses (Johnson, Cuellar Mejia, and Cook 2015). Many dual enrollment leaders agreed. But the improvement in broadband and device access, as well as instructor training, may help strengthen support and access to courses.

When we inquired about how colleges will ensure that CCAP students are successful in their online or hybrid course, the most common response our interviewees gave was by having a high school course facilitator work with the college instructor to support student success.

In a synchronous setting, the online course is taught remotely by a college professor, and students gather in their high school where a facilitator (e.g., high school teacher, classified staff) has students log in and follow along with the professor. Notably, the teacher and college instructor coordinate to distribute materials, they work together to identify students who may be struggling, and they collaborate to get students the support they need. Typically, the facilitator and instructor meet before class begins to coordinate. However, the level of coordination and engagement varies.

Interviewees indicated that it was critical for the high school facilitator to communicate with the college instructor behind the scenes to support the students. College professors and high school facilitators use student outcomes to guide their instruction and provide support when needed. The use of additional staff and student data to support student success offers a promising model to rethink student success in a post-pandemic world.

Conclusion and Recommendations

Nationally, dual enrollment has grown dramatically over the last several years. In California, this has been partially driven by the launch of CCAP (AB 288, enacted in 2016), which broadened access to dual enrollment to student groups who had been historically underserved. COVID-19 further accelerated growth; as the pandemic led to severe enrollment declines among the general college population, it opened a door to the dually enrolled population (National Student Clearinghouse 2023).

Colleges and school districts are incentivized to continue growing dual enrollment programs thanks in part to initiatives and state funding opportunities. For example, the Recovery with Equity Taskforce recommendations, Golden State Pathways Programs, Regional K–16 Education Collaboratives Grant

9. Namely, if the governing board of the college district meets the requirements specified and has a policy on cohort models as it relates to closed courses then the CCAP course can be limited to high school students.

Program, and the governor's compacts with the UC and CSU all explicitly call out dual enrollment to further college access and success with equity in mind. The 2022–23 state budget included $100 million to help launch or expand CCAP and $100 million to help launch or expand middle college or early college programs.

CCAP students were more likely to intend to transfer to a four-year university than their non-CCAP and non-dual enrollee peers, and former CCAP students are reaching critical milestones, like completing a gateway math/English course at higher rates, and achieving more success along the way, especially compared to their non-dual enrollee peers. However, in many areas, CCAP students do not appear to do better than graduates of other dual enrollment programs. The difference may be due to student selection, wherein more high-achieving and motivated students are more likely to participate in non-CCAP dual enrollment programs.

We do find that Latino and Black CCAP students do better than their Latino and Black peers who did not participate in any dual enrollment on the range of outcomes we examine. We also find that female students of all races generally do better than their male counterparts. CCAP students who are the first in their family to attend college also do considerably better than their first-generation peers who did not participate in dual enrollment. These findings, albeit descriptive, add to the evidence that dual enrollment programming that aims to expand to long-underserved populations can boost college outcomes, compared to the status quo of no or limited access.

However, challenges remain to improve overall outcomes—especially compared to students in other dual enrollment programs—and to reduce gaps between students from different racial/ethnic groups within CCAP. Below we provide a series of recommendations derived from our research.

Provide quality opportunities to acquire college knowledge and navigational skills. College dual enrollment leaders perceived offering college success courses as part of dual enrollment as a key to student success. Given the target population of CCAP, which includes high shares of first-generation college students, providing quality opportunities to acquire college knowledge and navigational skills at key points on the path to college could promote stronger college outcomes. Two key transition points for dual enrollees are when they take their first dual enrollment course and when they are preparing to graduate from high school and exploring postsecondary options.

If a student success course is provided as one of the first dual enrollment courses students take, they can learn more about college expectations, college services and supports, and essential strategies including time management, study skills, and career/major exploration. A second student success course that students take when they are preparing to transition into college could help them complete college applications, college admissions essays, the Free Application for Federal Student Aid (FAFSA), the California Dream Act Application (CADAA), and continue to build knowledge about college expectations and the importance of support services. Making access to these success courses universal could help level the playing field and address the persisting gaps between student groups. This approach would support the state's efforts towards universal FAFSA/CADAA completion, support college-going beyond the local community college, and work towards meeting the state's 70 percent postsecondary attainment goal.

It is important, however, that these success courses are rigorous, high quality, align with completing A–G requirements, and be transferrable to UC and/or CSU. Additionally, as community colleges facilitate the transition into college, CCCs should not have an incentive to encourage bachelor's-intending students to enroll in the CCC, when students would otherwise be eligible and able to attend a four-year college directly. Fiscal incentives that give community colleges credit for supporting college readiness for a broader group of students and for supporting A–G eligible students to enroll directly in a four-year college could help ensure that CCCs are helping match students with the appropriate college choice.

Connect CCAP students with college services and supports. CCAP and dual enrollment students gain immediate access to all high school and college services and supports, including tutoring, the library, counseling, the food pantry, and mental health services, among others. However, as evidenced in the findings on CCAP program gaps across race/ethnicity, gender, and first-generation status, dual enrollment students who are most underserved in higher education may not be fully aware or taking full advantage of access to college services and supports.

Programs could address the logistical challenges around the distance from the high school to the college by offering online services and supports and proactively connecting students to these supports. At one college, the dual enrollment instructor for transfer-level English actively required students to get feedback on their papers from the college's writing center. To raise awareness about support programs and encourage participation, colleges should coordinate outreach efforts among offices and departments, including Puente, Umoja, basic needs offices, mental health and counselor support departments, as well as academic departments.

Prioritize and incentivize CCAP offerings that meet requirements across segments. To promote college going and success, courses should meet both high school A–G and transfer requirements. General education courses that transfer across UC, CSU, and CCCs are the most valuable in supporting college success. On this front, CCAP has a tremendous opportunity to align efforts across equity-centered policy initiatives.

First, CCAP can offer students dual enrollment ethnic studies, which is or will be a high school, CCC, and CSU graduation requirement, and has been shown to improve the high school and college outcomes for underserved students (Bonilla, Dee, and Penner 2021).

Second, CCAP can enable high school students to complete gateway math and English courses so they can move directly into their major and other general education courses when they enroll in college. The high school setting is perceived as a more supportive environment (e.g., high school and college counselors/ teachers looking out for the student)—the high-challenge, high-support structure needed to succeed in these courses could be well suited for this setting.

Provide clarity on CCAP course offerings. Challenges that may inhibit the growth of key gateway courses include the availability of qualified instructors, concerns that a college course may compete with high school course offerings and requirements, and uncertainty about whether the courses can be offered online.

To be successful, the state, system offices, and high school districts will need to work together to ensure there are sufficient qualified instructors to teach these courses. Efforts to hire, train, and retain dedicated

dual enrollment instructors to teach gateway courses and the upskilling of high school teachers are important steps in this direction.

The Chancellor's Office could provide clarity on the type of courses that colleges can offer through CCAP dual enrollment and who can teach these courses. Finally, the incentives in the student success metrics and the funding formula will need to be aligned so that colleges are given their due credit if students complete gateway math and English courses through dual enrollment.

Recruit former CCAP students into college promise programs. It is critical for students to maintain the early momentum gained while in CCAP once they are in college; connecting them to the college's student success programming is key to these efforts and can go a long way in helping address the persistent gaps in college outcomes for students within the CCAP program.

Many colleges now have "Free College" programs that bundle academic and nonacademic supports, such as one college's "Promise Program." Such programs should require key student behaviors and completion of milestones that are tied to successful college outcomes, like full-time enrollment, completing the FAFSA or CADAA, completing gateway math and English, and earning at least a 2.0 GPA and 24 credits within the first year. More colleges could align these programs with outcomes and behaviors that promote college success.

Monitor the use of online dual enrollment. The use of online dual enrollment is considered a strategy that helps boost access, especially for rural students and for those who might otherwise have scheduling conflicts.

Dual enrollment leaders expressed an interest in offering online dual enrollment moving forward. Courses must be high quality, effective, and well-supported to promote student success. Connecting current CCAP students to community college online academic and nonacademic supports will be key to improving access and success. Having high school staff and college instructors collaborate and use data to inform efforts to promote student success in online courses is also well poised to promote stronger and more equitable outcomes.

As online dual enrollment offerings grow, research will be needed to help monitor outcomes and equity of this approach. Strengthening these online offerings and supports will help ensure that as CCAP students transition to being only college students, they will gain the confidence, knowledge, and navigational skills to succeed in online courses later in their college career.

Link data to fully assess the role of CCAP in college access and success. The absence of K–12 data that links to CCC data limits our ability to assess whether CCAP is indeed changing the college pathways for students who were not already on a college path. Additionally, it is unclear if the program is unintentionally diverting students to a community college who could go directly to a four-year college.

With data linked across the post-secondary and K–12 systems, we could identify whether CCAP students are A–G ready and assess their college-going outcomes. Furthermore, our current study was only able to assess college outcomes for CCAP students who graduated from high school and matriculated into a California Community College. While the CCC's National Student Clearinghouse data match enabled us to determine if former CCAP students enrolled in another college, including a four-year college, that data does

not have student-level records necessary to examine how students are doing in those colleges and whether they are making timely progress toward achieving their college goals. Thankfully, the Cradle to Career System is on the horizon and is poised to help us assess how access to dual enrollment shapes a student's high school and college journeys and how former CCAP students do at the UC and CSU.

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