



## Bridging College and Careers: Using Dual Enrollment to Enhance Career and Technical Education Pathways

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The Concurrent Courses Initiative (CCI), supported by The James Irvine Foundation from 2008 to 2011, funded a selection of secondary–postsecondary partnerships in California to implement or enhance career-focused dual enrollment programs. These programs specifically targeted youth who were low-income, struggling academically, or within populations historically underrepresented in higher education, aiming to improve their high school and college outcomes.

This Brief examines associations between CCI dual enrollment participation and various student outcomes for the first two years of the initiative. Using regression and propensity score matching methods, we evaluate the outcomes of participants in the first two years of the initiative relative to comparison students in the same school districts, examining the apparent effects of the CCI on high school GPA and graduation as well as postsecondary enrollment, persistence, and credit accumulation.

## Dual Enrollment, Career–Technical Education, and the Concurrent Courses Initiative

Dual enrollment allows high school students to enroll in college courses and receive college credit, often for free. Providing high school students with an early college experience through dual enrollment may have the potential to improve their academic and nonacademic skills, help them understand what will be required of them in college, and encourage their future college attendance by showing that they are indeed capable of doing college-level work (Karp, 2006). Previous research has found dual enrollment participation to be correlated with positive high school and college outcomes, including college enrollment and persistence (Karp, Calcagno, Hughes, Jeong, & Bailey, 2007; Speroni, 2011a, 2011b).

In addition, a growing body of evidence suggests that providing students with a rigorous, engaging, and relevant education can improve their likelihood for success. Career and technical education (CTE) has been found to reduce the likelihood of high school dropout, and “well-designed career-focused programs can improve employment, earnings, non-academic skills, and career choices, particularly for at-risk and low-income youth” (Kazis, 2005, p. 16). Programs with a career focus can engage students through applied learning and help them see pathways through college to future employment.

Prior research suggests that dual enrollment programs offered to CTE students in particular are associated with positive outcomes. Career–technical students who participated in dual enrollment have shown higher college enrollment, grade point averages, and credit accumulation than similar career–technical students who did not take dual enrollment courses (Karp et al., 2007). Thus, the

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combination of rigorous career–technical education and dual enrollment has great potential to meet students’ college and career readiness needs.

With the Concurrent Courses Initiative, The James Irvine Foundation pursued an approach that combined CTE and dual enrollment. The CCI provided support to eight secondary–postsecondary partnerships in California as they developed, enhanced, and expanded career-focused dual enrollment programs for three academic years starting in 2008–09. Seven sites participated during the 2008–09 academic year, with an eighth site beginning in 2009–10.

The eight programs focused on a variety of CTE areas, including health occupations, renewable energy, teaching careers, business, multimedia, and others. There was no prescribed program model; partnerships could select dual enrollment courses relevant to their particular career–technical programming, and they could deliver the courses on the high school or the college campus, based on local considerations (Edwards, Hughes, & Weisberg, 2011). CCI programs also provided supplemental supports, such as college visits and career preparation activities, for participating students.

Across both years, there was considerable variation in how the CCI was implemented across the sites. Sites varied in terms of the scale of their programs (ranging from 71 to 1,707 students), the percentage of students taking dual enrollment courses (ranging from 9 to 100 percent), the array of supplemental activities offered, and the intensity of the supplemental activities. CCI implementation within a given site, on the other hand, was fairly consistent over time as the programs expanded over the two years of operation.

## Data

This study uses data acquired through the California Partnership for Achieving Student Success (Cal-PASS). Cal-PASS is a voluntary, statewide data collection system that aims to spur collaboration between K-12 schools and the higher education system. Since sharing data is voluntary, we worked with Cal-PASS to ensure participation by the education institutions that were part of the CCI. The K-12 data contain student background, course enrollment,

and test score information, and the college dataset contains information on college enrollment and performance. The standard file was collected over three academic years (2008–2009, 2009–2010, and 2010–2011), yielding information on CCI participants in high school and then in college.

In addition to these standard data files that yielded demographic and education data, we created a custom file to collect information on the students’ participation in CCI activities, including the types and number of support services students received as well as whether dual enrollment courses were taken on the high school or college campus. The custom files were collected for the academic years 2008–09 and 2009–10. Across these two years of implementation, we are able to show the demographic characteristics and educational backgrounds of program enrollees, the number of dual enrollment courses taken, and the extent of supplementary supports that CCI students participated in.

Partners were instructed to input data for all students in the CTE pathways who participated in any CCI activity. Thus, we have data for the full population of “CCI participants,” some of whom received the full treatment of dual enrollment plus support services and some of whom participated only in support services. (It was very rare for students to enroll in dual enrollment without any supplemental service.) The subset of CCI participants who received the full treatment are referred to as “CCI dual enrollees.” We are primarily concerned with this latter group, and we calculate outcomes only for them.

## Methods

The goal of our analysis is to determine the association between the high school and college outcomes and taking one or more CCI dual enrollment courses during the academic years 2008–09 and 2009–10. In order to identify the apparent effects of dual enrollment, we use a series of ordinary least squares and probit regression models controlling for background characteristics and test scores to compare CCI dual enrollees with all students in the same district and school year as the dual enrollees.

To more accurately identify the apparent effects of the CCI, we need to address the issue of selection

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bias, or the extent to which students who select into the CCI—both as participants and as enrollees—differ systematically from comparable students across their districts. Based on student test scores and family backgrounds, the CCI exhibits both negative and positive selection—negative selection because the participants are less advantaged than the average student in the district, and positive selection because the dual enrollees are more advantaged than the typical CCI participant.

We attempt to capture these selection effects by estimating a propensity score model (Rosenbaum & Rubin, 1984). This model matches CCI dual enrollees with “observably equivalent” district students, based on characteristics including parental education and prior test scores. For each site, we create for each student a propensity score, which is a weight that increases according to the correspondence of characteristics between dual enrollees and district students. We then estimate the average treatment effect, accounting for this propensity score. We run these models only for the dual enrollees—the students who received the full treatment—compared with their district peers. In general, the propensity score results are similar to those obtained using the regression models.

## Results

### *High School Outcomes*

To determine whether the CCI may have contemporaneously influenced students’ performance in high school, we compare the GPAs of dual enrollees and comparable students within their districts. We find that CCI dual enrollees and their district peers had similar high school GPAs. We also examine whether CCI dual enrollees were more likely to graduate from high school. This outcome must be interpreted cautiously. It is possible that CCI participation influences the probability a student will graduate from high school. However, it seems likely that a student who makes it to 12th grade and is enrolled in the CCI will graduate at the end of that academic year. Nevertheless, our analysis finds that the graduation rates of the dual enrollees were higher than the averages for their districts.

### *College Outcomes*

Given that the CCI began in 2008–09, only a limited number of participants have graduated from high school, become eligible for college, and have made some headway into their college careers. Thus, our analysis of college-level outcomes is restricted to the first few years of college for those students who were in 12th grade in each of the academic years. For those dual enrollees who were in 12th grade in 2008–09, it is possible to examine their college-level performance in 2009–10 and in 2010–11. For the 2009–10 cohort, it is possible to examine their college-level performance in 2010–11.

With regard to college-going, CCI dual enrollees entered college at rates similar to their district peers. The two groups were also equally likely to enroll in CCI partner colleges after graduating high school. Among those who enrolled in college, the majority of the CCI dual enrollees and their district peers enrolled at two-year colleges. There is, however, a significant positive association between CCI dual enrollment participation and attending a four-year college. Controlling for student characteristics including high school GPA, dual enrollees are predicted to have enrolled at a four-year college at a rate two percentage points above that of their district peers (7.5 percent of whom, on average, enrolled at a four-year college). Our analysis also indicates that there were higher rates of persistence among CCI dual enrollees, and these are statistically significant after controlling for ability.

Dual enrollees also accumulated more college credits than comparison group students. For the graduating classes of 2009 and 2010, the comparison group college students had accumulated 9.6 and 8.7 credits after one semester, respectively. The dual enrollees had accumulated 1.2 and 1.3 credits more than these amounts. The gains are greater as the students progressed through college. After one year of college, the comparison groups had accumulated on average 16.9 and 17.2 credits (classes of 2009 and 2010, respectively); the dual enrollees had 1.7 and 3.0 more credits. After two years in college, the class of 2009 comparison group had accumulated an average of 23.4 credits; the CCI dual enrollees had accumulated an additional 4.6 credits. This is a difference of 20 percent more credits than their district peers.

In addition, it is worth noting this estimated difference may not fully capture the total credit accumulation of the CCI dual enrollees. While conducting the analyses, we found that not all CCI dual enrollees were transferring their dual enrollment credits to the postsecondary institution they enrolled in after high school graduation.

## Conclusion

Overall, the results of this study show that career-focused dual enrollment with supports—as it was implemented across the eight CCI sites—has the potential to promote high school and college success. CCI dual enrollees had higher high school graduation rates than their nonparticipating district peers. They also had higher rates of persistence in college and accrued more college credits.

Given these results, policymakers should consider dual enrollment an important part of any college readiness strategy and should attempt to craft policies that reduce barriers to dual enrollment. For example, waiving dual enrollment tuition for disadvantaged students would enable the participation of those students who most need a supportive early college experience in order to achieve postsecondary success.

State support to sustain dual enrollment partnerships is of critical importance. Of the eight CCI programs that received support from The James Irvine Foundation, two could not continue once the funds were depleted. While the others continue to offer dual enrollment experiences, they face severe financial challenges. Given the generally positive results found by this and other studies, dual enrollment participation should be encouraged and supported whenever possible, particularly for those students who might otherwise be unlikely to pursue postsecondary education.

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