



## POLICY BRIEF:

# The Effects of Dual-Credit on Postsecondary Student Outcomes

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### SUMMARY

An increase in a cohort's share of students earning at least one dual credit increases its high school graduation; university application, admission, and enrollment; timely certificate and degree completion; and an increase in bachelor's degrees earned.

Furthermore, high schools that increase the average dual credit earned up to 30 SCH improve student outcomes with each added credit. High schools can further amplify dual credit effects by prioritizing certain dual credit subjects, leveraging technology-based modes of instruction, and locating classes on high school campuses.

Finally, in a comparison between dual credit and Advanced Placement (AP) courses, dual credit is the only one to improve the timely completion of certificate and degree programs and to produce profound increases in bachelor's degree completion rates with increases in average credit earned.

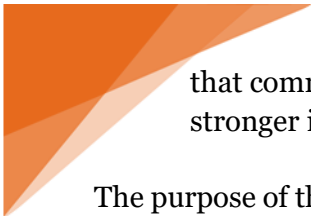
## Study Overview

### Context and Importance of the Problem

The surest path to the middle class in today's global economy comes from an education that goes beyond high school. In Texas, as in the nation, the number of jobs requiring a post-secondary credential is increasing, while jobs requiring a high school diploma become more scarce. The challenge and promise of postsecondary education is greater in a large, fast-growing, diverse state like Texas where the fastest-growing segments of the population are economically disadvantaged and come from communities historically underserved by higher education institutions. Recognizing this reality, the Texas Higher Education Coordinating Board set a goal to raise the percent of 25- to 34-years-olds in Texas with a certificate or degree to 60 percent by 2030. In 2015, it was 41 percent. (Carnevale, 2013; Murdock et al, 2014; THECB, 2015).

To achieve this goal, a study of more than 3 million Texas high school students who entered 9<sup>th</sup> grade in 2001 to 2011 recommends a massive expansion of college credit offered within Texas high schools, through a model known as dual credit. Dual credit programs involve a collaboration between a school district and a college. They allow high school students to enroll in college-level courses and simultaneously earn college and high school credit. This is the largest and most comprehensive study of dual credit to date.

The study found that dual credit increases high school graduation, college enrollment, and shortens the time to graduation for both community college and university students. The report recommends that state agencies work with institutions of higher education and school districts to (1) expand dual credit to every high school student; (2) raise the amount of dual credit earned per student to 30 semester credit hours (SCH); and (3) prioritize English and social science dual credit followed by math, computer science, and CTE dual credit in improving dual credit programs. It also recommends that the state pursue policies to overcome the current shortage of teachers who are qualified to teach dual credit by using modes of instruction that leverage technology and



that community colleges embrace their role as partners with secondary education in creating stronger integration between secondary and higher education curriculum.

The purpose of the study was to estimate the effects of dual credit on a broad set of student outcomes that trace a student's journey from high school to college graduation. A second purpose of the study was to investigate the potential for improving the design of dual-credit programs to strengthen their impact. To accomplish this second objective, the study examined dual-credit effect sizes by program attributes such as subject matter taught, the teacher's highest degree held, mode of instruction, and location of instruction.

## Methodology

The study recognizes dual credit as a policy adopted and implemented at the school level. Its research design, therefore, operates at the school level. Using school-level fixed effects regression analysis, it estimates the change in student outcomes of a given school caused by changes in dual-credit participation at the same school. Because each school serves as its own control group, this approach controls for unchanging school attributes such as location and type. It also controls for relatively stable attributes, such as the demographic and socioeconomic composition of the study body. Dual-credit effects presented below represent the marginal effect of a school increasing dual-credit participation by a school's ninth-grade cohort. All effect sizes given below are statistically significant at a 0.05 p-value threshold.

## Policy Background

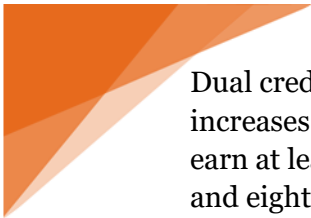
In 1995, the Texas legislature authorized institutions of higher education to offer dual credit in partnership with local school districts. As of 2014, Texas community colleges acted as the higher education sponsor in all but 5 percent of dual-credit programs.

Dual credit participation has grown in Texas. By 2014, 72 percent of public high schools offered dual credit. Within dual-credit high schools, 27 percent of their students earned dual credit. Of these dual-credit students, the number of dual credits earned doubled, from a mean of approximately 6 SCH for the cohort that entered high school in fiscal year 2001 to 9 SCH for the cohort that entered high school in fiscal year 2011.

## Key Findings

The study first estimated the effects of all high school students within a high school cohort earning at least one dual credit. The results affirm the consensus of existing research (Allen and Dadgar, 2012; An, 2013; Hughes, 2016; Giani et al, 2016; Karp et al, 2007; Speroni, 2011; Swanson, 2008). When all students of a high school earn at least one dual credit, the cohort's four-year graduation rate increases by 4.4 percentage points, up from 68 percent. It's percent of students applying to a university while in high school increases by 11.5 percentage points, up from 19 percent. It's percent of students admitted to a private or public Texas university while in high school increases by 10.8 percentage points, up from 16 percent. And, it's percent enrolling in a university the year following high school increases by 11.6 percentage points, up from 15 percent.

Dual credit also speeds the pace of community college certificate and degree completion. When all students of a high school earn at least one dual credit, the cohort's rate of students who complete a community college certificate program within two years from high school graduation more than doubles. And, it's rate of students who earn an associate degree within two years from high school graduation nearly triples.



Dual credit also shortens the time to graduation for students pursuing a bachelor's degree and it increases the total number who earn a bachelor's degree. When all students of a high school earn at least one dual credit, the cohort's rate of students who earn a bachelor's degree four, six, and eight years after high school graduation increases by 5.5, 9.0, and 8.6 percentage points, up from 5, 11, and 13 percent, respectively. The eight-year graduation rate can be considered a completion rate because a student's probability of earning a bachelor's degree after eight years is near zero.

### **Is More Dual Credit Better?**

The study investigated the effects of increasing the number of successfully completed dual-credit courses. It did this by estimating predicted outcomes when a cohort's average dual credit earned ranges from 0 to 30 SCH. It found that some outcomes peaked at a low dose of dual credit; while others continued to increase with each increase of average dual credit earned as show in Figure 1 below.

A cohort's expected high school graduation plateaus at 70 percent when a cohort's average dual credit earned reaches 9 SCH. A cohort's expected share of students that apply to, are admitted to, and enroll in a university reaches 41.5, 39.5, 39.3 percent, respectively, when average dual credit earned reaches 30 SCH.

Dual credit moves expected community college enrollment in the opposite direction of expected university enrollment. A cohort's expected share of students that enroll in a community college the year following high school drops from 26.8 percent to 17.3 percent when a cohort's average dual credit earned increases from 0 to 30 SCH. This suggests that dual credit shifts student aspirations from a community college to a university education.

A cohort's expected certificate graduation rate plateaus at approximately 2 percent when average dual credit earned reaches 15 SCH. A cohort's expected share of students that earn an associate degree within two years from high school graduation reaches 22 percent when average dual credit earned reaches 30 SCH. A cohort's expected share of students that earn a bachelor's degree within six years from high school graduation reaches 75.8 percent when average dual credit earned reaches 30 SCH. These results suggest that a blanket policy capping dual credit enrollment per student at less than 30 SCH should be rejected.

### **Dual Credit Effects Compared to Advanced Placement (AP)**

School leaders often question which model of advanced coursework is most likely to help prepare students to succeed in college, dual credit or AP. The findings suggest that school leaders should provide a balance of both that includes more dual credit. While both improve university enrollment and graduation rates, dual credit is the only college-prep curriculum to improve outcomes for community college students – Texas's largest share of college students.

Most notably, increasing levels of dual credit earned produce a more profound impact on college graduation. A cohort's expected share of students that earn an associate's degree within two years from high school graduation reaches 22.2 percent when average dual credit earned reaches 30 SCH; while it only reaches 2.4 percent when average AP credit earned reaches 10, the equivalent of 30 SCH. A cohort's expected share of students that earn a bachelor's degree within six years from high school graduation reaches 75.8 percent when average dual credit earned reaches 30 SCH; while it only reaches 27.5 percent when average AP credit earned reaches an equivalent level.



## Dual Credit Effects by Subject

Not all dual credit courses are equally beneficial, and some harm student outcomes as shown in Figure 2 below. Dual credit in career and technology education (CTE) is the only dual credit subject that improves a cohort's high school graduation rate. It also increases the share of students applying to a university while in high school and completing a certificate within two years of high school graduation.

English dual credit is the most effective type of dual credit in improving a cohort's rate of bachelor degree attainment. An increase in a cohort's average English dual credit earned increases university application and enrollment rates. It increases associate degree graduation within two and four years after high school graduation. And, it increases bachelor's degree graduation rates within four, six, and eight years after high school.

In this study, social science dual credit includes courses in history, government, economics, sociology, and psychology. An increase in a cohort's average social science dual credit earned increases a cohort's share of students who pursue a bachelor's degree: application, admission, and enrollment increase. It also increases associate degree graduation within two years after high school graduation. And, it increases bachelor's degree graduation within four, six, and eight years after high school.

An increase in a cohort's the average math dual credit earned increases university application and enrollment. But, it had no effect on certificate or degree graduation rates. This finding is significant, given the current push at the highest levels for STEM education.

An increase in a cohort's average computer science dual credit earned increases bachelor degree graduation within four and six years of high school graduation. And, an increase in a cohort's average foreign language dual credit earned increases associate degree graduation rates within two years after high school.

Dual credit subjects classified as "Other" decrease certificate and degree graduation rates. And, science, health, and art dual credit produce no statistically significant effects.

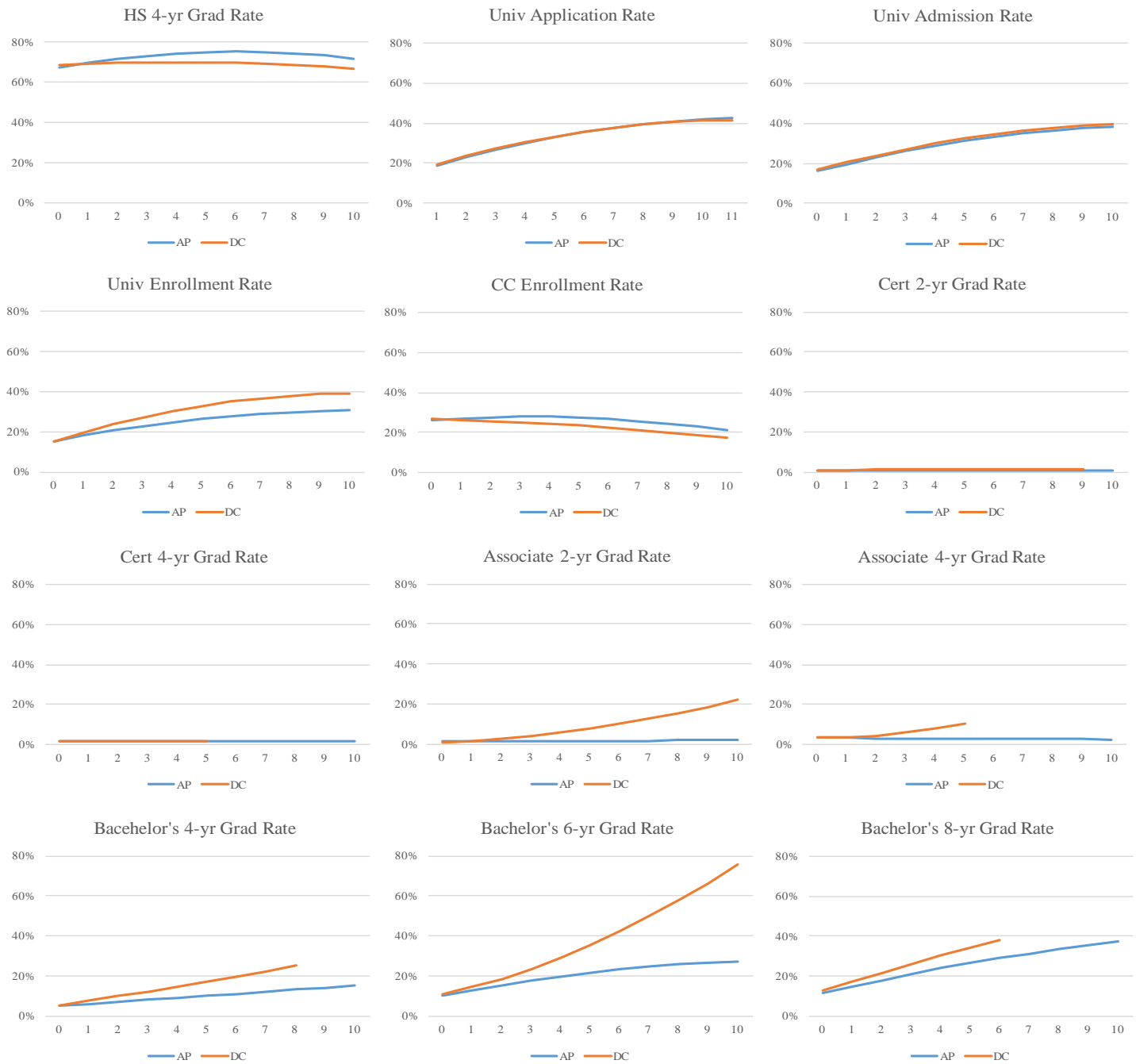
## Other Heterogeneous Effects

Dual credit instructors in Texas must hold either a master's degree or a doctorate. College administrators often question the rigor of dual credit courses, which are most commonly taught by instructors with a master's degree only. The study found no statistically significant difference between dual credit impacts produced by these two types of instructors.

Some variation was found in dual credit impact by instruction mode. Dual credit that involves computer-only instruction produces a unique and positive impact on a cohort's high school graduation rate. Dual credit that involves one-way video instruction produces a unique and positive impact on a cohort's university application rate.

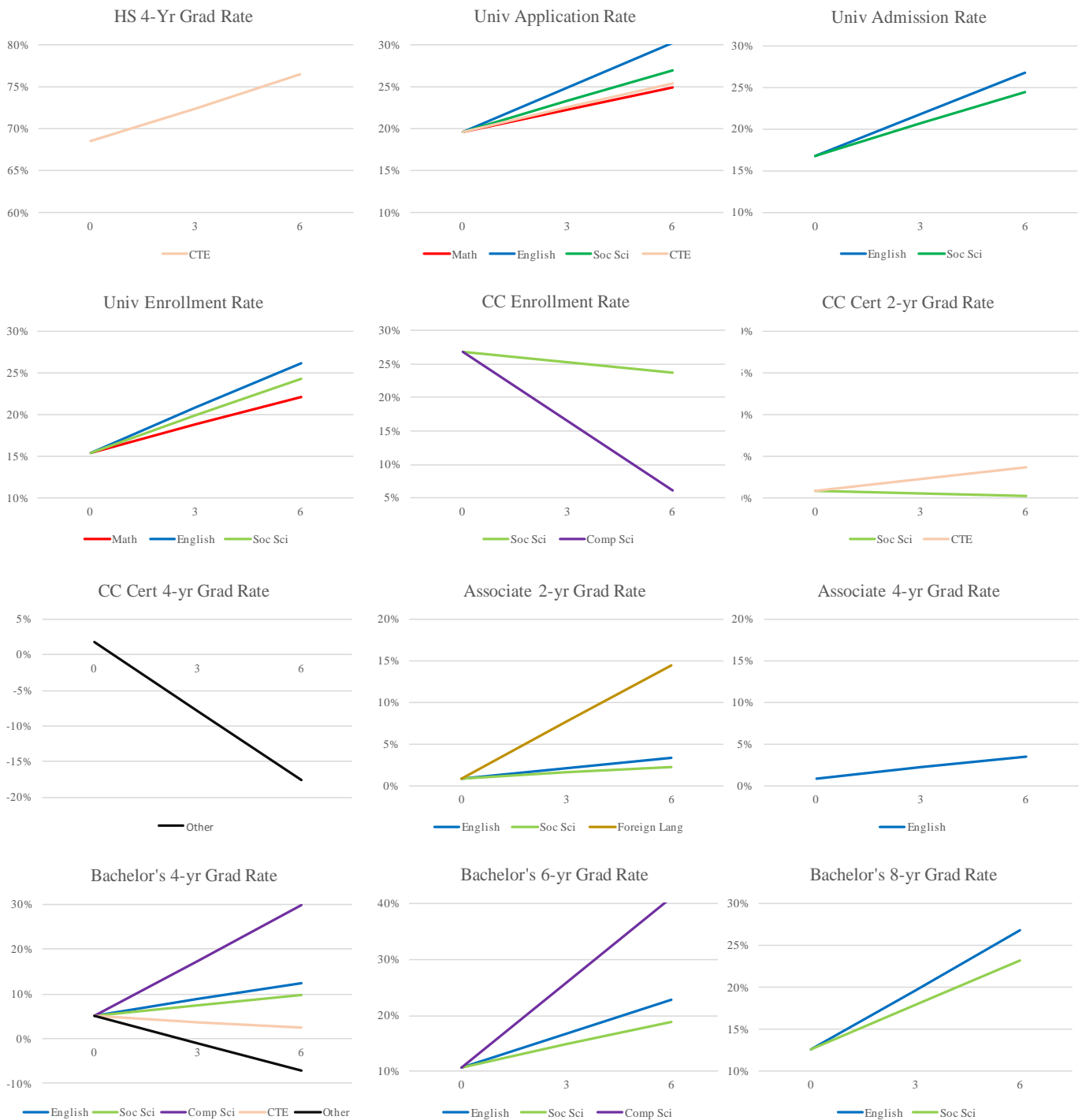
Variation was also found in dual credit impact by location of instruction. Dual credit offered on high school campuses produces an impact on high school graduation; university application, admission, and enrollment; and community college enrollment larger than dual credit offered on community college campuses. In exploring variation in dual credit impacts by instructor, mode, and location high school graduation, and college access outcomes were the only ones examined due to data limitations.

Figure 1. Expected Secondary and Postsecondary Student Outcomes by Average Dual Credit and AP Earned at 0 to 10 credits (or 0 to 30 SCH)



Note: The graphs above only chart expected outcomes that are statistically significant. University application and admission rates are based on application and admissions while in high school. University and community college enrollment rates are based on enrollment in the first year following high school graduation. College graduation rates are based on years from high school graduation.

Figure 2. Expected Secondary and Postsecondary Student Outcomes by Dual Credit Subject at 0, 3, and 6 Semester Credit Hours



Note: Dual credit impact was examined by ten subjects listed above plus science, health, and art. The graphs are limited to dual-credit subjects that produce statistically significant effects on student outcomes. The impact of science, health, and art dual credit did not produce statistically significant effects.

## Conclusion

For Texas to increase college attainment of 25- to 30-year-olds to 60 percent by 2030, it needs to advance policies that redesign the current education system. Evidence suggests dual credit is a systemic innovation that can deliver this magnitude of change. To do this, the state needs to support high schools and colleges in aggressively expanding dual credit to all high school students, increasing the amount of dual credit earned per student, and prioritizing dual credit courses that produce the largest effects. Any policy capping dual credit enrollment per student at less than 30 SCH should be rejected.

For high school and college leaders, the findings suggest that they create dual-credit programs that are broad and deep in student participation. Programs should allow for no less than 30 SCH and prioritize English and social science dual credit, followed by math, computer science, and CTE dual credit. Though more data is required to certain variation in dual-credit effects, early evidence suggests dual credit delivered through technology can be a solution for overcoming the current shortage of qualified dual-credit teachers; and, the need for teachers with doctorates is not justified. The early evidence also suggests that dual credit located at high schools is superior to those taught on community college campuses. This is contrary to theory, which suggests that dual credit courses are most impactful when they are “authentic” college courses. The evidence suggests that the practicality of taking dual credit on a high school campus may be more beneficial.

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