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# Promising Combinations of Dual Enrollment, AP/IB, and CTE

## The College and Earnings Trajectories of Texas High School Students Who Take Accelerated Coursework

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# Introduction

Each year, high school students across the country enroll in coursework to earn credit toward a college degree or prepare for skilled employment and postsecondary career-technical training. Participation in "college-and-career-accelerated coursework"—a term we use for courses that offer an on-ramp to either college or career pathways during high school—positively influences postsecondary enrollment and labor market earnings (An & Taylor, 2019; Dougherty et al., 2019). Its significance is underscored by research showing that the years immediately following high school play a critical role in shaping long-term labor market outcomes.

Taking accelerated coursework in high school can propel students into postsecondary educational or skilled-career paths with strong employment and earnings returns. Young adults who earn a bachelor's degree or enter a skilled-career path in their early 20s are more likely to secure a good job, one with strong earnings potential, by age 30 (Carnevale et al., 2023). In Texas, workers aged 25 to 30 years who hold at least a bachelor's degree earn substantially more than workers with an associate degree or less (Texas Education Agency [TEA], n.d.-g), and this is consistent with national trends for workers aged 25 to 34 (National Center for Education Statistics [NCES], 2024a).

Prior research has examined and documented the benefits of taking dual enrollment (DE), Advanced Placement (AP), or high school career-and-technical education (CTE) on students' college enrollment, credential completion, and earnings. Research suggests that each of these accelerated coursework types improves student outcomes through a variety of mechanisms: AP increases four-year institutional enrollment and bachelor's degree completion, although the benefits are larger for students from less disadvantaged backgrounds (Owen, 2024; Smith et al., 2017; Speroni, 2011; Taylor, 2015; Wyatt et al., 2015). DE increases credential attainment, including bachelor's completion, while shortening the time to degree completion (see literature reviews by the Institute of Education Sciences [IES, 2017] and Schaller et al. [2023]). High school CTE increases employment and earnings outcomes, although there is large variation by field of study. There is also evidence associating high school CTE with completion of an associate degree and, less so, a bachelor's degrees. Prior research generally examines each coursework type in isolation. Yet K-12 schools often encourage students to take a mix of accelerated coursework to improve students' preparation both for careers and college: Students frequently take combinations of these courses.

Using detailed administrative data from Texas on students who were expected to complete high school in 2015-16 and 2016-17 (complemented with data from those who were expected to complete in 2019-20 and 2022-23), we examine how students combine different types of accelerated coursework in high school and how these combinations relate to students' postsecondary attainment and earnings trajectories by their mid-20s. We developed six distinct student subgroups—which we refer to as college-and-career-accelerated coursework profiles (see a detailed description in Table 2):

- **DE-only takers**
- **DE takers with a CTE focus (10 or more CTE courses)**
- **DE and AP/IB takers**
- **AP/IB takers with no DE**
- **CTE-focus-only takers**
- **No accelerated coursework (no DE or AP/IB; fewer than 10 CTE courses)**

We use these mutually exclusive categories to describe accelerated coursework and associated differences in students' postsecondary attainment and earnings trajectories by their mid-20s, or between one to six years from expected high school completion, and across student demographics. Our analysis does not account for unobserved factors that may influence both how students select into different coursetaking profiles and their outcomes, so the results do not represent the causal effects of each profile.

By broadening the scope of research on accelerated coursework to take into account how students combine multiple types of offerings, this study provides new insights into how different coursetaking patterns may contribute to students' educational and workforce outcomes. We also document the characteristics and outcomes of students who do not take accelerated coursework to highlight the need and opportunity for K-12 schools, colleges, and states to further expand educational and economic opportunity for students in the formative years following high school.

## Key Takeaways

1. **Students who take accelerated coursework, particularly dual enrollment, have much stronger postsecondary and earnings outcomes in their early 20s than those who do not take any accelerated coursework.** Students with no accelerated coursework have the weakest outcomes and lowest earnings by age 24.

    - Although participation in accelerated coursework has grown in Texas, 28% of students expected to graduate in 2022 took none, with men, low-income, Black, and Hispanic students overrepresented in this group. Roughly one third of students in our sample took AP/IB but no DE, and one fifth took DE, either alone or combined with other accelerated coursework. The number of students who accumulated at least ten high school CTE courses with no other accelerated coursework (i.e., those with a CTE focus only) has also increased, reaching 21% by 2022.

    - By age 24, six years after expected high school completion, fewer than 40% of students with no accelerated coursework had enrolled in college, and only 10% completed a postsecondary credential. Among male, low-income, Black, and Hispanic students with no accelerated coursework, only 6% to 8% had earned a credential by age 24. In contrast, over 45% of students who took DE or AP/IB completed a credential by that age. CTE-focus-only students had a 17% credential completion rate, higher than students who took no accelerated coursework but well below DE and AP/IB students.

    - Students with no accelerated coursework had relatively high earnings right after high school, but by age 24, they had the lowest average quarterly earnings ($7,000) relative to students with some type of accelerated coursework. They were also less likely to be employed in-state or to report any earnings. In contrast, DE students—especially those who combined DE with AP/IB—had much stronger earnings growth, reaching $8,900 to $10,000 per quarter by age 24, or 27% to 40% higher than students with no acceleration.

**We focus on the attainment and earnings outcomes of students in the first, third, and sixth year from their expected high school completion year, when students are approximately 19, 21, or 24 years old, respectively.**

2. **Students who combine AP/IB with dual enrollment are less diverse and initially earn less than students in other profiles. But by age 24, their earnings rise sharply.** After controlling for student and school characteristics (including test scores), as well as credentials completed, DE and AP/IB takers earn significantly more than the students who take AP/IB without DE. Fewer than 5% of students take DE alone; they have postsecondary outcomes and earnings trajectories similar to those students who take AP/IB with no DE.

    - Students who took AP/IB without DE made up the largest group of accelerated coursework takers, comprising about one third of the high school cohorts. About 15% of the cohorts were DE and AP/IB takers, and only 3% of the cohorts took DE alone without combining it with AP/IB or a CTE focus. While students who took AP/IB without DE reflected the broader Texas high school population with regard to income and race/ethnicity, DE and AP/IB takers were less diverse, with lower representation of low-income, male, Hispanic, and Black students.

    - Students who took AP/IB with DE had the strongest and fastest positive postsecondary outcomes, with 92% enrolling or completing a credential by year one post high school, 19% earning a credential by year three (including 6% earning a bachelor's degree), and 60% earning a bachelor's degree by year six. These gains held after accounting for student demographics, academic performance, and high school characteristics.

    - Students who took AP/IB with or without DE had lower earnings in the first three years after high school compared both to students with no acceleration and to CTE-focus-only students, averaging $2,300 in quarterly earnings in year one and $4,000 in year three. But by age 24 their earnings rose sharply: AP/IB and DE students' earnings averaged $10,300 per quarter, compared to $8,900 for students who took AP/IB without DE. After controlling for student demographics, test scores, and high school characteristics, DE and AP/IB takers held a 14% advantage over AP/IB takers without DE, though the gains were notably smaller for low-income students with associate or bachelor's degrees.

3. **Students who combine career-and-college-accelerated coursework—such as those who focus on CTE and take DE coursework—have stronger postsecondary attainment and sustained earnings gains by age 24 compared to students with a CTE-focus-only approach or no accelerated coursework.** However, DE takers with a CTE focus represent only a small share of Texas high school completers.

    - The share of Texas public high school students who accumulated at least ten high school CTE courses (CTE-focus-only students or DE takers with a CTE focus) grew from 19% in 2016 to 25% in 2022. However, fewer than 5% of students had a CTE focus and also took at least one DE course. Low-income, male, and Black students were underrepresented among CTE-focus students who also took DE, but they were overrepresented among CTE-focus-only students (those without DE).

    - Students who combined DE with a CTE focus had much stronger postsecondary enrollment and attainment outcomes than CTE-focus-only students (those without DE), even after accounting for student background. By age 24, 32% of DE takers with a CTE focus earned a bachelor's degree, compared to just 7% of CTE-focus-only

students. They also completed credentials more quickly—21% earned a credential by age 21, compared to 6% among CTE-focus-only students.

- CTE-focus-only students had the highest earnings in the first three years after high school, but by age 24, DE takers with a CTE focus earned more, averaging $9,700 per quarter, second only to AP/IB with DE takers. Combining DE with a CTE focus was linked to a 16% earnings boost at age 24 compared to CTE-focus-only students, including gains for those with certificates (17%) and associate degrees (13%). Young male DE takers with a CTE focus, especially certificate holders, had strong earnings, while low-income students earned less overall.

4. **ECHS students are more likely to be from underrepresented groups, and they exhibit relatively strong early postsecondary and earnings outcomes.** Yet ECHS students represent only a small share of the Texas public high school population.

    - Early college high school (ECHS) students represented 5% of Texas public high school cohorts in 2019 and 2022, with most taking some college-and-career-accelerated coursework, most commonly a combination of DE and AP/IB. Having a CTE focus, alone or with DE, was less common among ECHS students than among all students. By the third year after high school, more than 30% of ECHS students who took DE alone or with AP/IB earned an associate degree, compared to 21% of DE takers with a CTE focus. ECHS students who took DE earned more than DE students overall in the third year post high school. Given that our research was able to track these students for only three years after their expected high school completion, it is unclear whether earnings gains will persist by age 24, especially if students earned liberal or general studies associate degrees, which are associated with low earnings, and did not successfully transfer and earn bachelor's degrees.

# Background and Prior Evidence

High school students have access to several types of accelerated coursework, including dual enrollment, AP, IB, and CTE. These courses offer opportunities to earn college credit and prepare for skilled jobs and postsecondary training. Here we provide a brief overview of each course type, its prevalence among Texas students, and prior research on how participation in it shapes postsecondary and labor market outcomes.

## Dual Enrollment

DE programs allow students to take college courses while concurrently enrolled in high school (IES, 2017; Schaller et al., 2023). These courses, taught by college faculty or qualified high school instructors, may be taken at the high school, a college campus, or online through a local college partnership. Students who complete a DE course with a passing grade earn college credit, which may be transferable depending on institutional policies.

Nationally, 81% of public high school students attend schools offering DE courses.[1] DE courses may be offered à la carte (students take one or more courses based on their interest or course availability) or through more intensive models like Early College High Schools (ECHSs) or Pathways in Technology Early College High Schools (P-TECHs).

In Texas, dual enrollment—better known there as dual credit—may be academic or technical in nature (TEA, n.d.-d). To enroll in most academic courses, students must meet college readiness standards by passing the Texas Success Initiative assessment or qualifying for an exemption (Texas Higher Education Coordinating Board, 2018). While some students or school districts pay for dual credit, the State of Texas provides funding to colleges and universities to offer these courses at no cost to economically disadvantaged students (TEA, n.d.-d). As of 2024, nearly a quarter million Texas high school students were enrolled in dual credit, accounting for 18% of the state's total public higher education enrollment (Decker, 2025).

Evidence suggests that à la carte DE participants are more likely to enroll in and complete college, earn credentials in fewer years, and earn higher wages than nonparticipants (Dhaliwal et al., 2025; Giani et al., 2014; Henneberger et al., 2020; IES, 2017). However, benefits vary based on the number and type of courses taken and student background. Benefits accumulate with more courses taken (Giani et al., 2014; Villarreal, 2017). Online DE students have somewhat lower pass rates but higher college enrollment rates than DE students taking courses in person, and students taking DE at a community college earn lower grades but are more likely to attend college—particularly a community college—than those taking DE on a high school campus (Ryu et al., 2023). Passing common required courses, such as college algebra, is associated with particularly strong outcomes (Giani et al., 2014; Hemelt et al., 2020; Minaya, 2021; Speroni, 2011). The benefits of DE extend across demographic groups, with some evidence suggesting greater gains for low-income students and students of color (Taylor et al., 2022).

Despite these benefits, challenges remain. DE enrollment participation is uneven, with underrepresentation among Black, Hispanic, and first-generation college students (Shivji & Wilson, 2019). Additionally, advising challenges for DE students—including a lack of understanding about credit transfer and degree paths—can result in the accumulation of excess credits when they enroll in degree programs after high school (Witkowsky et al., 2020).

## Advanced Placement

Advanced Placement (AP) courses follow standardized college-level curricula set by the College Board. In over 30 offerings, students can take an AP exam—regardless of course enrollment—and may receive college credit with a qualifying score, often of 3 (on a 1-to-5 scale) or higher, based on institutional policies (College Board, n.d.). In 2022-23, nearly 25% of 11th and 12th grade students in Texas took an AP exam; about half of exams taken resulted in a score of 3 or higher (TEA, 2024a). In Texas, AP courses have no formal eligibility requirements beyond prerequisite completion, but students must pass the AP exam in order for the credits to be transferable to college. The State of Texas provides funding to support exam fees and teacher training (TEA, 2024b).

Descriptive research finds that AP students earn higher first semester college GPAs than non-AP peers, even after adjusting for demographic and academic factors (Scott et al., 2010). AP participants are also more likely to complete college; however, AP is not associated with shorter time to degree (Taylor, 2015). One causal study found that students earning a credit-granting AP exam score were 1%–2% more likely to earn a bachelor's degree within four years (Smith et al., 2017).

When comparing the benefits of AP and dual credit participation, data from Texas shows that 30 DE semester credit hours increases the likelihood of college degree completion more than an equivalent number of AP credits, particularly for community college students (Villarreal, 2017). However, College Board data suggests that AP students generally have stronger postsecondary outcomes than DE students, except when DE courses are taken through a four-year college partnership (Wyatt et al., 2015).

## International Baccalaureate

The International Baccalaureate (IB) is a program offering rigorous high school courses with college credit potential based on exam performance. IB offers two distinct program types: the Diploma Programme and the Career-related Programme (International Baccalaureate Organization, n.d.). The Diploma Programme includes a two-year academic curriculum, while the Career-related Programme includes à la carte or career-centered courses. Nationally, 127,447 high school students are enrolled, but participation in Texas is low, where only 0.8% of 11th and 12th graders took an IB exam during the 2022-23 school year (TEA, 2024a). Unlike for AP courses, IB participation may require an application or prior coursework from the student. Like for AP, the state provides funding to support exam fees and teacher training (TEA, n.d.-a).

No identified studies assess the causal impact of IB. One study controlling for parental education and prior academic ability found that IB Diploma students were 38% more likely to enroll in college within two years of graduating high school (Saavedra, 2014).

## High School Career and Technical Education

CTE courses offer career exploration and workforce readiness training, often through sequenced pathways in fields like IT or health sciences. Upon completion of the entire outlined sequence at the high school, students are sometimes able to earn an aligned industry-based certification or college credit; however, many courses lack clear articulation to postsecondary programs (Steiger et al., 2023). In Texas, CTE programs generally have no eligibility requirements. Schools may apply for Perkins funding to support or expand CTE offerings (TEA, n.d.-b), and districts receive additional state funding based on student CTE participation (TEA, n.d.-c). Most high school students in Texas take at least one CTE course, and approximately 25% are considered CTE concentrators, having completed two or more courses within a program of study (O'Hara et al., 2024).

Nationally, CTE is the most commonly taken accelerated coursework; 85% of high school graduates have taken at least one course and 39% of these students have completed at least two course credits in a single CTE program of study (NCES, 2024b). Participation varies widely, from attending full-time at CTE-focused schools to taking individual elective courses.

Overall, students who take CTE courses in high school are more likely to enroll in college and earn a credential than students who do not take CTE courses—though typically they attend two-year colleges and earn degrees at the associate level rather than the bachelor's level (Dietrich et al., 2017; Lindsay et al., 2024). Research also consistently finds that students who take CTE coursework have higher employment probability after high school (Lindsay et al., 2024). However, earnings returns vary substantially depending on the type

and field of the credential earned (Dougherty et al., 2019; Soliz, 2023; Stevens et al., 2019), and for students who complete a credential in their CTE cluster field (Plasman et al., 2017). Male and rural students are more likely to enroll in CTE (NCES, 2024a).

### Early College High Schools

ECHSs and P-TECHs are cohort-based, intensive DE programs that aim to provide students enough college credits to earn an associate degree or two years of transferable credit while in high school. P-TECHS sometimes have a career focus, but most ECHSs emphasize general education coursework required for an associate of arts degree. These programs often serve underrepresented students and are typically low or no cost. In Texas, ECHSs are programs within Texas high schools that enable students to simultaneously earn a high school diploma and either an associate degree or up to 60 hours of transferable college credit. Designed to increase college readiness among disadvantaged students, ECHSs in Texas are rigorous, no-cost academic pathways that offer additional student support (TEA, n.d.-e). While there are no strict eligibility criteria to enroll, students must meet college readiness standards—typically by passing the Texas Success Initiative assessment—to take college-level academic courses. For districts that use applications to manage ECHS enrollment, open-access lotteries are encouraged (TEA, 2024c). The Texas Education Agency provides grants to support schools in launching ECHS programs (TEA, n.d.-e).

Experimental and observational studies show that ECHS participants are more likely to enroll in college and complete a degree, especially at four-year institutions and especially among low-income and minority students (Berger et al., 2013; Edmunds et al., 2020; Song et al., 2021). Other studies find that about a quarter of ECHS students complete an associate degree by high school graduation (Berger et al., 2013; Webb & Gerwin, 2014). One study from North Carolina's P-TECH program found that its students were more likely to earn a certificate or associate degree but less likely to earn a bachelor's (Edmunds et al., 2024).

## Data Description

This report uses statewide administrative data provided by the Texas Education Research Center (ERC), a research center and data clearinghouse at the University of Texas at Austin. The ERC data track student-level high school enrollment at Texas public schools through the Texas Education Agency (TEA), student-level postsecondary enrollment in Texas public postsecondary institutions through the Texas Higher Education Coordinating Board (THECB), and quarterly earnings of Texas students through the Texas Workforce Commission (TWC). These data cover student demographics, high school attendance, high school course enrollment, high school graduation, college enrollment, dual credit course enrollment, and college graduation, along with high school campus and district information, as well as quarterly earnings for in-state workers. We complemented the postsecondary enrollment records with student-level data from the National Student Clearinghouse, which, in the Texas ERC, include only students who graduated from Texas high schools, capturing their enrollment and credential attainment at out-of-state postsecondary institutions. Put together, these data allow us to track all Texas public

secondary students from secondary school through college, starting with the high school entering cohort from 2011-12 academic year, as well as their quarterly earnings up to six years after their expected high school completion for those working in state.[2]

## High School Completion Cohorts

This report focuses on students expected to complete high school in the 2015-16 and 2016-17 academic years (hereafter referred to as the 2015 and 2016 high school completion cohorts).[3] That is, we focus on all students who started high school (9th grade) in the 2011-12 and 2012-13 academic years, prior to their potential participation in college-and-career-accelerated coursework. Fewer than a fifth of students in these cohorts did not complete high school on time, and a share of students appear to never have completed high school, most of whom are concentrated among the students with no accelerated coursework (See Appendix Table A1).[4] Data from these cohorts enable us to examine students' postsecondary trajectories up to six years after students' expected high school graduation, when they were around 24 years old.

To provide a more recent view of accelerated coursework in Texas, we complement the results with descriptive findings from two additional cohorts, spaced three years apart: students expected to graduate high school in the 2019-20 and 2022-23 academic years. For these 2019 and 2022 cohorts, we track their postsecondary outcomes up to three years after and one year after high school, respectively. Although the primary focus of the report remains on the 2015 and 2016 cohorts, results from the 2019 and 2022 cohorts are used to contextualize and update key findings. Our sample includes 661,558 students from the 2015 and 2016 cohorts, 362,273 students from the 2019 cohort, and 374,515 students from the 2022 cohort.

## Student Characteristics

This report examines the trajectories of Texas high school students by their college and career accelerated coursework profiles, along several student characteristics.

- **Gender:** Each student's sex and is categorized as male or female. Across all cohorts, 51% of high school students are men and 49% are women.
- **Race/ethnicity:** The TEA classifies students into the following mutually exclusive categories: Asian, Black or African American, Hispanic (or Latino), White, and other. About half (47% to 50%) of Texas high school students are Hispanic, 33% to 30% are White, and 13% are Black. Asian students and students under other race/ethnicity categories each represent fewer than 5% of students.
- **Low-income:** We classify as low-income the students who were classified as free and reduced-price lunch (FRPL) eligible at their start of high school or in 9th grade.[5] Fifty-four percent of students were low-income at the time they started high school.
- **Title I high schools:** These are schools receive federal funding based on their high proportion of low-income students.[6] We classified students as attending one of these schools based on their 9th grade school Title I status. Sixty-seven percent of Texas high school students attended a title I high school.

- **Rurality:** We follow a condensed version of TEA's classification of geographic locale and flag the students' 9th grade high school by their geographic location into urban (city), rural, suburban, and town.[7] About 38% of students attended a high school in an urban area, 26% to 21% of students attended a rural high school, 28% to 31% attended a suburban school, and 9% attended a town school.
- **Early College High School (ECHS):** The ERC data include an indicator for students in the ECHS track, an intensive dual enrollment model within specific high schools that aims to offer students enough college credits to earn an associate degree or two years of transferable credit to a college. This indicator is available only since 2015. Hence, we flag students as ECHS students starting in the 2019 completion cohort. As of 2019, 5% of students were enrolled in the ECHS track.
- **College and career accelerated coursework:** We classify students' accelerated coursework into three types:
  - **Dual enrollment (DE):** The student attempted one or more DE courses while in high school.
  - **Advanced Placement and International Baccalaureate (AP/IB):** The student attempted one or more AP or IB courses while in high school. AP participation is much larger nationally and in Texas than IB; these two are combined given their shared programmatic focus on preparing students for baccalaureate programs.
  - **High school CTE:** The student attempted one or more CTE courses for one or more terms while in high school.

Table 1 provides descriptive statistics for the 2015 and 2016 cohorts and the 2019 cohort, including accelerated coursework attempted. Similar statistics for the 2022 cohort are available in Appendix A. Students who attempted more than one type of accelerated course are counted in multiple categories, which are therefore not mutually exclusive. Among the 2015 and 2016 cohorts, 94% of students attempted at least one high school CTE course, 40% attempted an AP/IB course, and 19% attempted a DE course. Accelerated coursework participation grew slightly among the 2019 and 2022 cohorts.

## Table 1.

**Student and School Characteristics**

| Characteristic | High school completion cohort | |
|---|---|---|
| | 2015 and 2016 (combined) | 2019 |
| **Gender** | | |
| Men | 51% | 51% |
| Women | 49% | 49% |
| **Race/ethnicity** | | |
| Asian | 3% | 4% |
| Black | 13% | 13% |
| Hispanic | 47% | 50% |
| White | 33% | 30% |
| Other | 3% | 3% |
| **Low-income** | | |
| No | 46% | 46% |
| Yes | 54% | 54% |
| **Title I high school** | | |
| No | 33% | 33% |
| Yes | 67% | 67% |
| **Rurality** | | |
| Urban – City | 38% | 39% |
| Rural | 26% | 21% |
| Suburb | 28% | 31% |
| Town | 9% | 9% |
| **ECHS track** | N/A | 5% |
| **Took accelerated coursework** | | |
| Dual enrollment (DE) | 19% | 22% |
| AP/IB | 40% | 43% |
| High school CTE | 94% | 95% |
| **Total number of students** | **661,558** | **362,273** |

# Findings

## How do Texas high school students combine accelerated coursework?

In this section, we examine the different types of college-and-career-accelerated courses taken by Texas public high school students. Because many Texas high school students take more than one type of accelerated coursework, we make use of six mutually exclusive student coursetaking profiles to capture how students combined these course types while in high school. We use these coursetaking profiles in subsequent sections of this report to describe variation in students' postsecondary outcomes and earnings after high school.

Given that all Texas high school programs of study (referred to as "endorsements") include CTE courses (TEA, n.d.-b), we distinguish students who took fewer than 10 courses from those who took 10 or more, and call the latter CTE-focus students. Appendix Table A2 shows that 30% of students in the 2015 and 2016 completion cohorts attempted at least 10 CTE courses, which is equivalent to roughly 5 credits of CTE coursetaking (or 1.25 CTE credits per year, if evenly distributed) by a student throughout their high school career.[8] We call students who took at least 10 CTE courses with no other accelerated coursework **CTE-focus-only** students.

Only one in every five students in the 2015 and 2016 cohorts attempted at least one DE course during their high school career (see Table 1). We characterize students who attempted at least one DE course as DE takers. Among DE takers, we further delineate between DE takers who attempted other types of acceleration coursework, such as students who also had a CTE focus **(DE takers with CTE focus)** or who attempted an AP/IB course **(DE and AP/IB takers).**[9,10] Students who were not CTE focused and did not attempt AP/IB but attempted DE are defined as **DE-only takers**. We also use a distinct profile for students who attempted at least one AP/IB course but did not take DE coursework **(AP/IB takers without DE)**.

The six categories we use in this report reflect a framework that aims to be most relevant to practitioners and policymakers. The taxonomy is also intended to emphasize the complementarities between DE and other forms of college-and-career-accelerated coursework in a way that shows how students take and combine courses in practice. In Appendix Table A2, we present the distribution of coursetaking among students in the sample, which helped us construct the six categories used in this report. Table 2 summarizes how these categories are defined and distinguished. Further below, Figure 1 presents the distribution of students by these coursetaking profiles.

**Table 2.**
**Accelerated Coursetaking Profiles**

| Profile name | Accelerated coursework attempted | | |
|---|---|---|---|
| | **DE** (at least 1 course attempted) | **AP/IB** (at least 1 course attempted) | **CTE focus** (at least 10 courses attempted) |
| DE-only takers | X | | |
| DE takers with CTE focus | X | | X |
| DE and AP/IB takers | X | X | Some[a] |
| AP/IB takers, no DE | | X | Some[b] |
| CTE focus only | | | X |
| No acceleration | | | |

*Note.* We use the term AP/IB to refer to all students who attempted at least one Advanced Placement (AP) or International Baccalaureate (IB) course while in high school, although the large majority of those students took AP. In Texas for the 2022-23 academic year, 0.8% of 11th and 12th grade students took an IB exam, a rate that has been stable over the years (TEA, 2024a). Students may take an IB exam without taking the course, although it is very uncommon (TEA, 2024b).

[a] 3.7% of students in the 2015 and 2016 cohorts were DE and AP/IB takers with a CTE focus.
[b] 7.6% of students in the 2015 and 2016 cohorts were AP/IB takers, no DE with a CTE focus.

## What are differences in accelerated coursetaking profiles by student demographics?

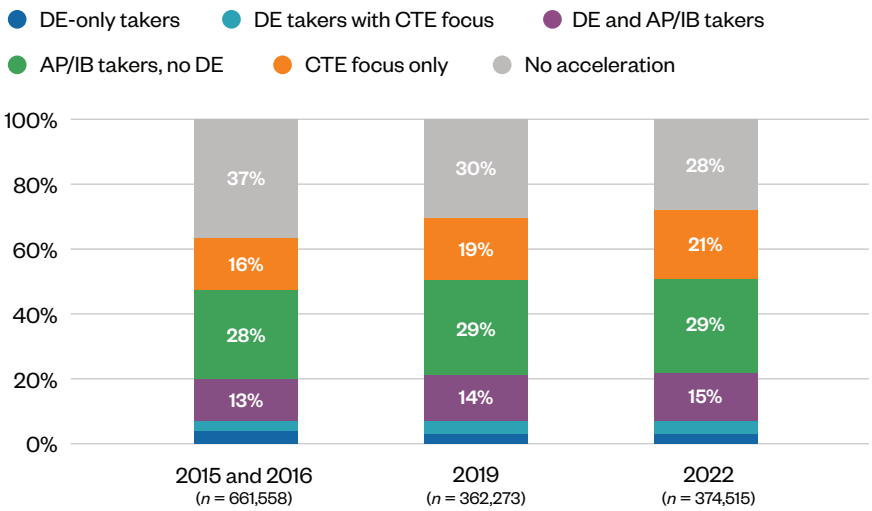
In this section, we describe the students in each of the six accelerated coursetaking profiles.

**College-and-career-accelerated coursework expanded in the past decade, driven mostly by increases in students who finish high school with many high school CTE courses.** Still, in the 2022 cohort, nearly half of high school students had not taken a DE, AP, or IB course, and more than a quarter neither took such courses nor accumulated substantial high school CTE coursework (i.e., they are in the "no acceleration" group). DE participation grew slightly, mostly due to students taking DE in combination with AP/IB.

Figure 1 shows, for each cohort, the percentage of students in each coursetaking profile. In the 2015 and 2016 cohorts, 28% of students took AP/IB without DE, and 37% did not take any accelerated coursework. Participation in accelerated coursework increased in more recent cohorts. In the 2019 cohort, the share of students with no accelerated coursework decreased 9 percentage points to 28%. Notably, the share of CTE-focus-only students increased from 16% in 2015–16 to 21% in 2022. DE participation grew from 20% to 22%, with the largest growth in the share of DE and AP/IB takers (13% in 2015–16, 15% in 2022). The share AP/IB takers with no DE remained stable at about 29%.

A notable and policy-relevant finding is the substantial share of students who took both DE and AP/IB courses (13% of students overall and two thirds of all students taking DE in the 2015 and 2016 cohorts). DE and AP/IB accelerated coursework options are sometimes viewed as competing rather than complementary (Hornbeck & Malin, 2019). However, as we show in the next section, students who took AP/IB without DE share many characteristics with DE students overall, and those who took both DE and AP/IB tended to have particularly strong outcomes. Notably, students who took AP/IB without DE represent the largest group among those enrolled in any form of accelerated coursework.

**Figure 1.**
**Distribution of Accelerated Coursetaking by High School Completion Cohort**




**Men, low-income, and Black students are underrepresented in dual enrollment, especially among those combining dual enrollment with AP/IB.** These same subgroups are overrepresented among students with no accelerated coursework or with a CTE focus only. Men, low-income, and Black and Hispanic students are better represented among students who take AB/IB but no DE.

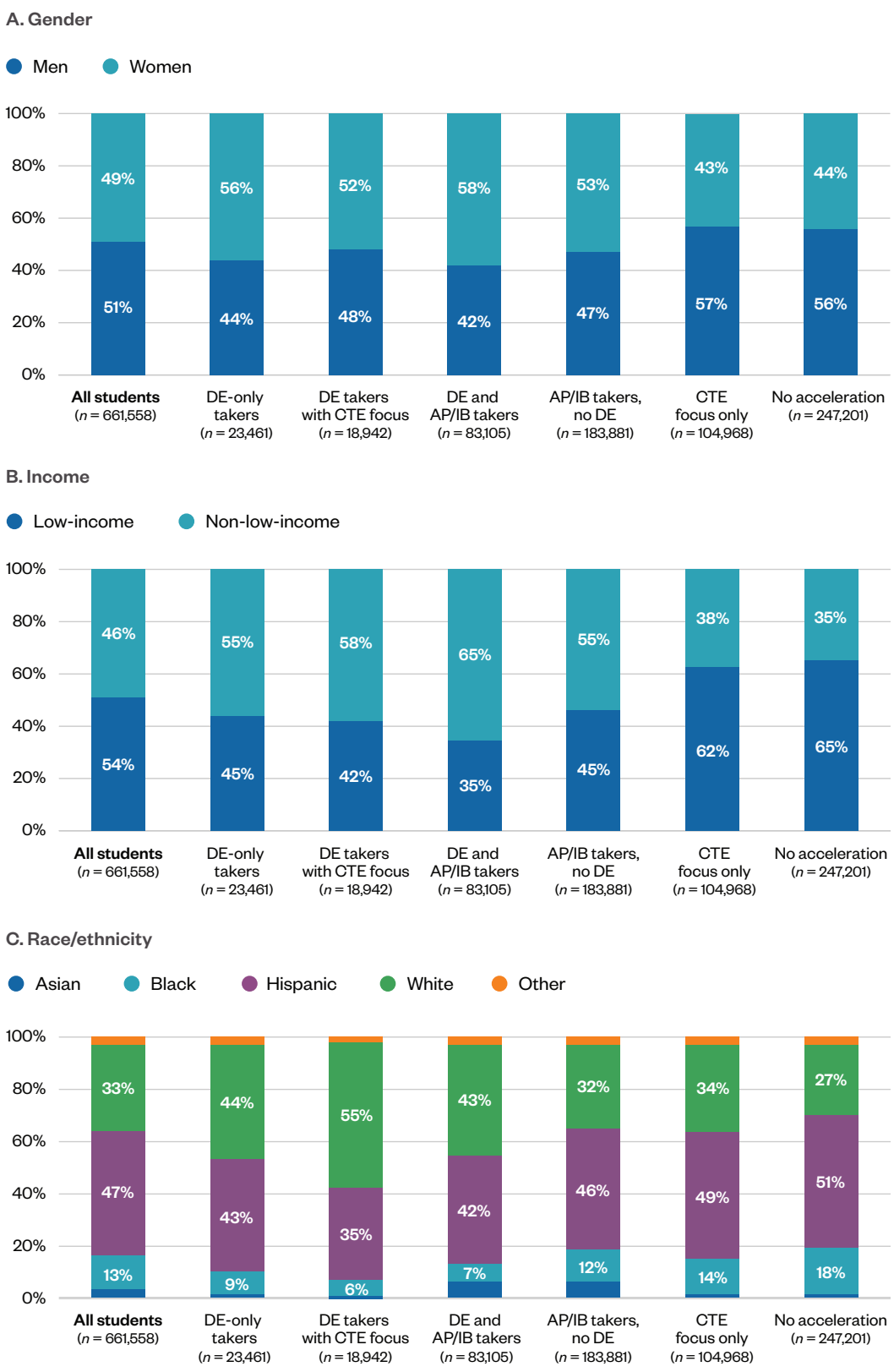
Figure 2 shows participation in the different college-and-career-accelerated coursework profiles by student gender, income group, and race/ethnicity for the 2015 and 2016 cohorts. Men, low-income, and Black students were underrepresented among DE takers in general. Notably, DE and AP/IB takers were less likely to be male, low-income, or Black than AP/IB takers with no DE. While 51% of all students were men, only 42% of the DE and AP/IB takers were; 47% of AP/IB takers with no DE were men. Similarly, low-income students comprised 54% of all students but only 35% of DE and AP/IB takers, 45% of DE-only takers, and 42% of CTE-focused DE takers. Underrepresentation in accelerated coursework is also evident among Black students, who represented 13% of all students, and 12% of the AP/IB takers with no DE, but 9% of the DE-only takers, 6% of CTE-focused DE takers, and 7% of DE and AP/IB takers. Participation for these groups is similar among the 2019 and the 2022 cohorts.

Notably, participation of Hispanic students in DE and AP/IB has improved over time. In the 2015 and 2016 cohorts, Hispanic students comprised 47% of students but only 42% of the DE and AP/IB takers. By 2019 and 2022, this gap closed to a two-percentage-point difference (52% of students versus 50% of DE and AP/IB takers) (see Appendix A).

With respect to the students who did not attempt dual enrollment courses, we find that women were overrepresented among AP/IB takers, whereas men were overrepresented among CTE-focus-only and no-acceleration students. Low-income students were overrepresented among CTE-focus-only students and no-acceleration students and underrepresented among AP/IB takers without DE. Black students were overrepresented among students with no accelerated coursework.

## Figure 2.

**Accelerated Coursetaking by Student Characteristics**




*Note.* Data are from the 2015 and 2016 high school completion cohorts.

## What are the postsecondary trajectories of Texas high school students, and how are these shaped by accelerated coursetaking?

In this section, we examine variation in students' postsecondary trajectories across college-and-career-acceleration coursetaking profiles. We focus on the highest postsecondary attainment of students by the first, third, and sixth year from their expected high school completion year, when students are approximately 19, 21, or 24 years old, respectively. We focus our analysis on students in the 2015 and 2016 high school completion cohorts, as we can track these students for six years post high school. Appendix A provides descriptive tables and figures for the 2019 and 2022 cohorts, which we will reference when pertinent through this section.

For each student, we identify their highest postsecondary attainment using the following hierarchy:

1. Completed a bachelor's degree.
2. Completed an associate degree.
3. Completed a postsecondary certificate.
4. Ever enrolled at a four-year institution.
5. Ever enrolled at a community college.
6. Never enrolled in postsecondary, no postsecondary credential.

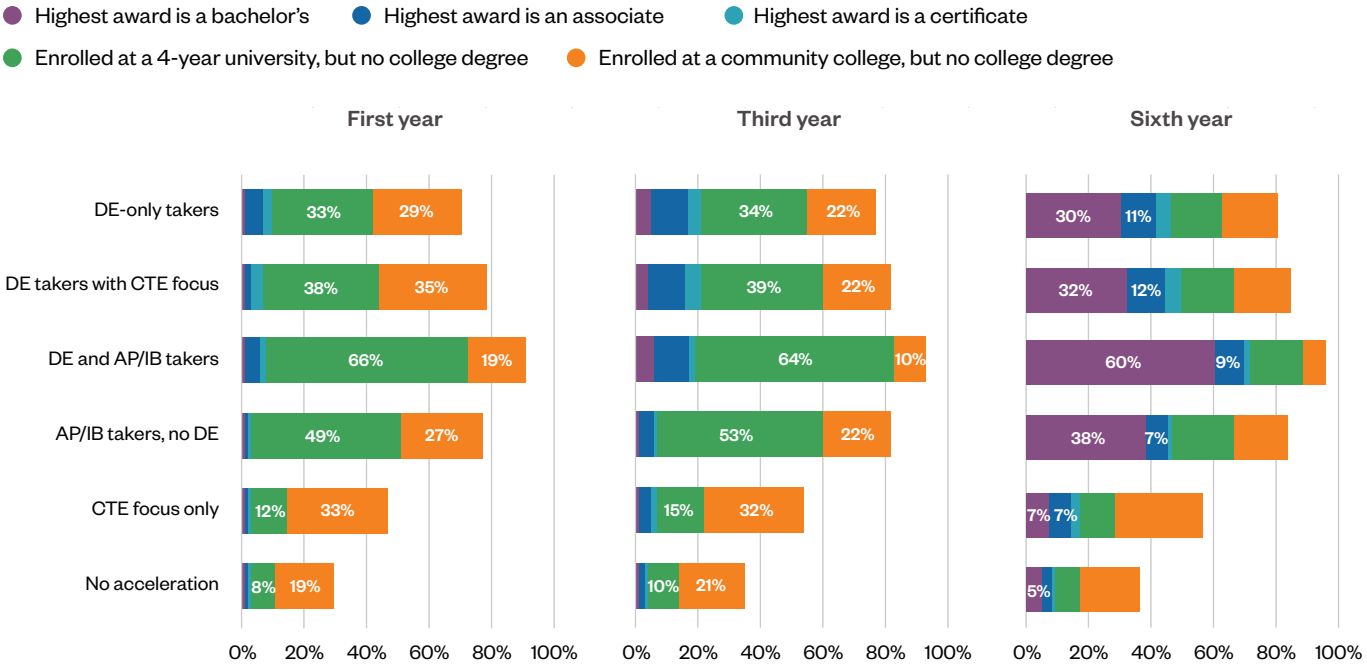
For example, if by the sixth year post high school, a student earned a bachelor's and an associate degree, then the student is classified as a bachelor's degree earner; if a student earned an associate degree and then enrolled either at a four-year or community college, that student is classified as an associate degree earner; if a student was enrolled at a four-year institution only or simultaneously in a community college but had not completed a postsecondary degree, we classified that student as ever enrolled at a four-year institution. Students who never enrolled at a postsecondary institution and never earned a credential by the given year post high school are considered as not enrolled and without award.

**Students with dual enrollment credit or AP/IB, alone or in combination, have much stronger postsecondary enrollment and attainment by age 24 compared with peers with a CTE focus only or no acceleration coursework, even after accounting for student and high school characteristics.** Students without college and career acceleration in high school enroll in college at rates less than half that of students who take DE or AP/IB coursework. DE students of all kinds complete credentials faster than other groups, with about one in five DE takers earning a credential three years post high school. Students taking both DE and AP/IB coursework are the most likely kind of DE taker to complete bachelor's degrees by age 24. Postsecondary enrollment rates barely move after the first year post high school, regardless of the coursetaking profile.

Figure 3 shows the highest postsecondary attainment within one, three, and six years of high school completion and by coursetaking profile for all students. Students who took DE in high school alone or in combination with AP/IB or CTE courses have higher postsecondary enrollment and credential attainment rates than students with no accelerated coursework or a CTE focus only. After six years, non-DE AP/IB takers had

higher bachelor's completion rates than DE-only takers and DE takers with a CTE focus but lower than that of DE and AP/IB takers. Among CTE-focus students, those who took DE courses were nearly three times more likely to earn a postsecondary credential six years after high school than were those who did not take DE.

**Figure 3.**
**Highest Postsecondary Attainment by Coursetaking Profile**




*Note.* Data are from the 2015 and 2016 high school completion cohorts.

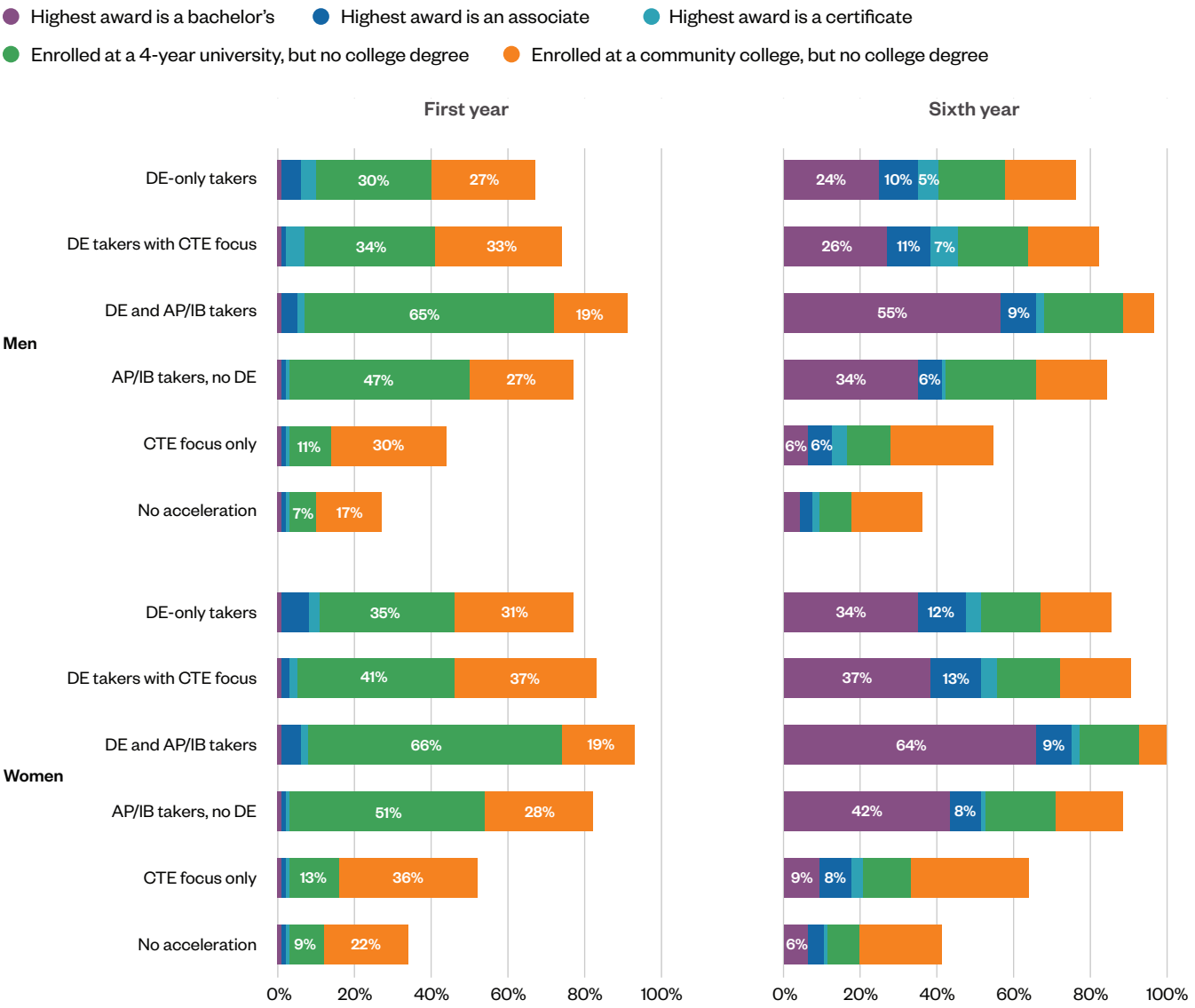
Differences in college outcomes across coursetaking profiles emerge quickly after high school and are evident after one year. Among DE and AP/IB takers, 85% of students enrolled in college and 7% already earned a certificate or associate degree. Among DE takers with a CTE focus, 73% enrolled in college and 6% earned a certificate or associate degree; and among DE-only takers, 62% enrolled in college and 9% earned a certificate or associate degree. AP/IB takers with no DE had similar enrollment rates as DE-only takers, but virtually no student had earned a credential. Among CTE-focus-only students, 45% enrolled in college and fewer than 1% earned a credential. Among students with no acceleration, 27% enrolled in college. Across coursetaking profiles, enrollment and credential completion rates were higher among women than among men (See Figure 4).

By the third year post high school, about one in five DE takers of all kinds earned a credential. Among DE and AP/IB takers, 6% earned a bachelor's; among DE takers with a CTE focus, 4% earned a bachelor's; and among DE-only takers, 5% earned a bachelor's. Associate degree completion rates for these groups were about 12%, and certificate completion rates were positive but below 5%. Among non-DE students, 1% of AP/IB takers earned a bachelor's and 5% earned an associate degree. Six percent of CTE-focus-only students had earned an associate or certificate but no bachelor's. Among students with no acceleration, only 2% earned a credential (an associate degree). Overall, postsecondary enrollment rates barely moved by the third year.

Six years after high school, DE students had much higher bachelor's completion rates than students who were CTE focused only or who took no accelerated coursework. DE and AP/IB takers had the highest bachelor's completion rates of all at 60%, followed by 32% of DE takers with a CTE focus, and 30% of DE-only takers. Among non-DE students, 38% of AP/IB takers completed a bachelor's degree in six years—lower than among the DE and AP/IB takers but higher than DE takers with a CTE focus or DE-only takers). When we add enrollment and attainment rates across course profiles, little changes compared with the overall postsecondary enrollment from the first year. Credential completion rates are slightly higher among women (See Figure 4). Appendix A shows that postsecondary trajectories within one to three years for students in the 2019 and 2022 high school completion cohorts follow similar trends.

## Figure 4.

**Highest Postsecondary Attainment by Coursetaking Profile and Gender**




*Note.* Data are from the 2015 and 2016 high school completion cohorts.

In a separate analysis, we conduct regression analyses to estimate the probability of credential attainment for each coursetaking profile, after accounting for student and high school characteristics. Details about the methodology and results are available in Appendix B. For non-DE students, we observe similar patterns to those described in Figure 3, although the magnitude of the differences is sometimes smaller. For instance, among students with no DE coursework, the differences in bachelor's completion rates between AP/IB students and those with a CTE focus only or no accelerated coursework attenuates from 32 to 25 percentage points difference. In the case of DE and AP/IB takers, we find the gap in bachelor's degree completion compared to AP/IB takers with no DE holds at 22 percentage points.

**Low-income students who take DE only, DE in combination with AP/IB, DE with a CTE focus, or AP/IB without DE have higher enrollment and credential attainment rates than low-income students with a CTE focus only or no accelerated coursework. However, there are large gaps in postsecondary outcomes between low-income and higher income students across all acceleration profiles.** By the sixth year after high school, low-income students with any combination including DE or AP/IB have much lower bachelor's completion rates (by 20–25 percentage points) compared to their non-low-income peers.

Figure 5 shows the postsecondary enrollment and attainment by coursetaking profile and low-income status. Low-income students who took AP/IB alone, DE alone, or DE in combination with AP/IB or with a CTE focus had much higher enrollment and degree attainment rates than low-income students with no acceleration coursework or with a CTE focus only. One year after high school, fewer than 40% of low-income students with a CTE focus only and 21% of low-income students with no accelerated coursework enrolled in postsecondary or earned a credential, compared to the at least 70% among students with DE or AP/IB. These trends persisted after six years post high school, where low-income CTE-focus-only students or no-acceleration students had a lower chance of bachelor's completion than low-income DE or AP/IB students.

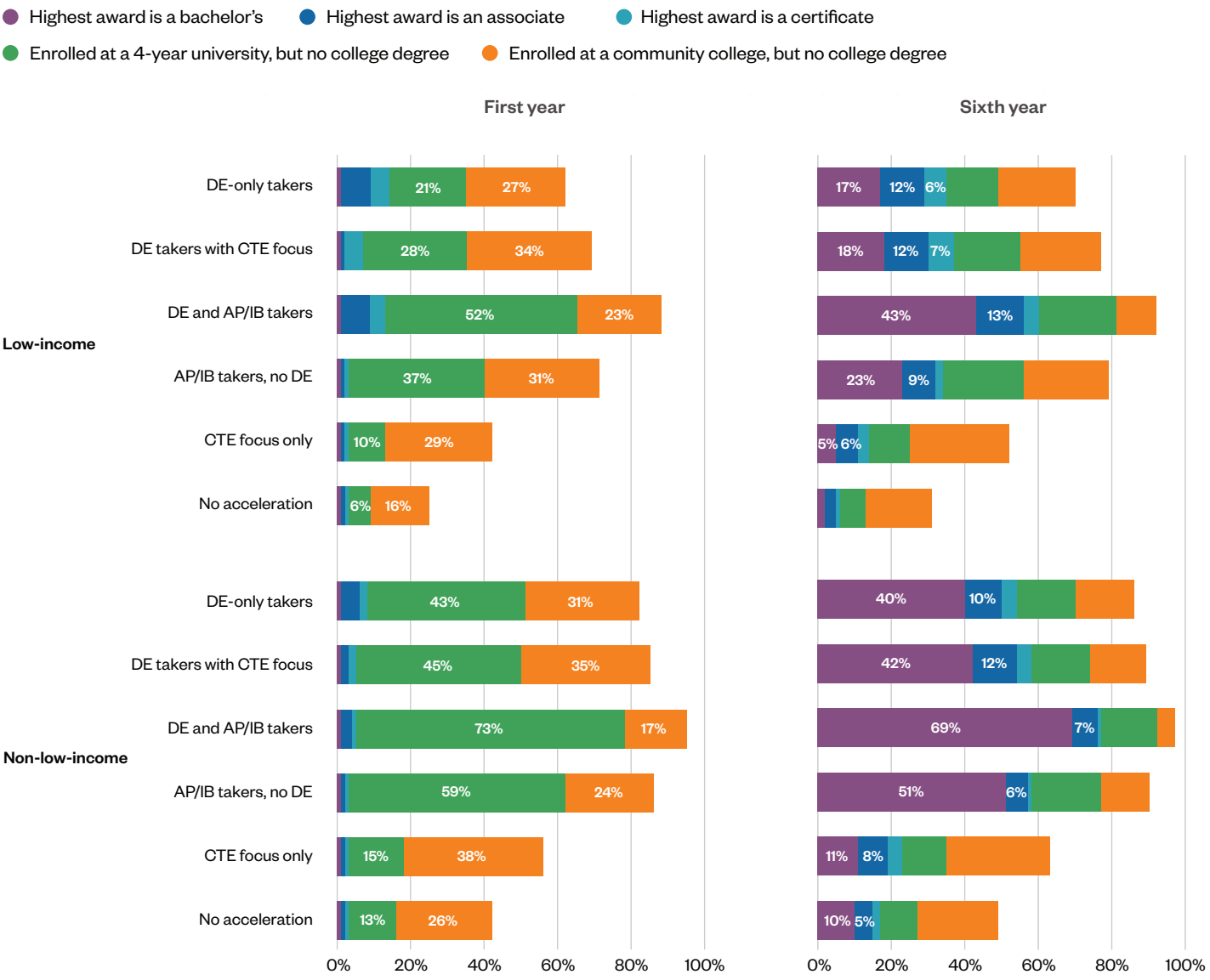
Despite the benefits associated with accelerated coursework for low-income students, there remain substantial gaps in postsecondary outcomes compared to non-low-income students taking accelerated coursework. This is particularly the case for DE-only takers and DE takers with a CTE focus. By the first year after high school, low-income students who took DE only or DE with a CTE focus had lower enrollment rates than their non-low-income counterparts. These differences were driven by gaps in enrollment at four-year institutions. Although 43%–45% of non-low-income DE-only takers and DE takers with a CTE focus enrolled at a four-year institution, only 21%–28% of low-income students with the same coursetaking profiles had done so. Notably, associate and certificate credential completion rates were slightly higher among low-income DE takers.

By the sixth year after high school, low-income DE-only takers were less than half as likely to earn a bachelor's degree than their non-low-income peers (17% vs. 40%) and were less likely to attain some postsecondary education or credential (70% vs. 87%). We find similar results among DE takers with a CTE focus. Among DE and AP/IB takers, there were also notable gaps in bachelor's attainment (43% vs. 69%). Among CTE-focus-only students and students with no acceleration, non-low-income students maintained higher credential attainment

rates than low-income students, but the overall credential attainment rate was below 25%. In short, while low-income students consistently benefited from accelerated coursework, there still remained sizable gaps in postsecondary outcomes with non-low-income students.

**Figure 5.**

**Highest Postsecondary Attainment by Coursetaking Profile and Income Group**




*Note.* Data are from the 2015 and 2016 high school completion cohorts.

**Overall differences in postsecondary enrollment and attainment by coursetaking profile look similar in the three primary racial/ethnic groups in our data. However, there are consistent gaps in postsecondary outcomes by racial/ethnic group and for each course acceleration profile.** By the sixth year after high school, Black and White students have higher enrollment and bachelor's completion rates than Hispanic students across all coursetaking profiles, and Hispanic students have higher associate degree completion rates among DE takers. These findings should be interpreted in context: Hispanic students are better represented in accelerated coursework than Black students, suggesting that the latter are likely a more selective group of students.

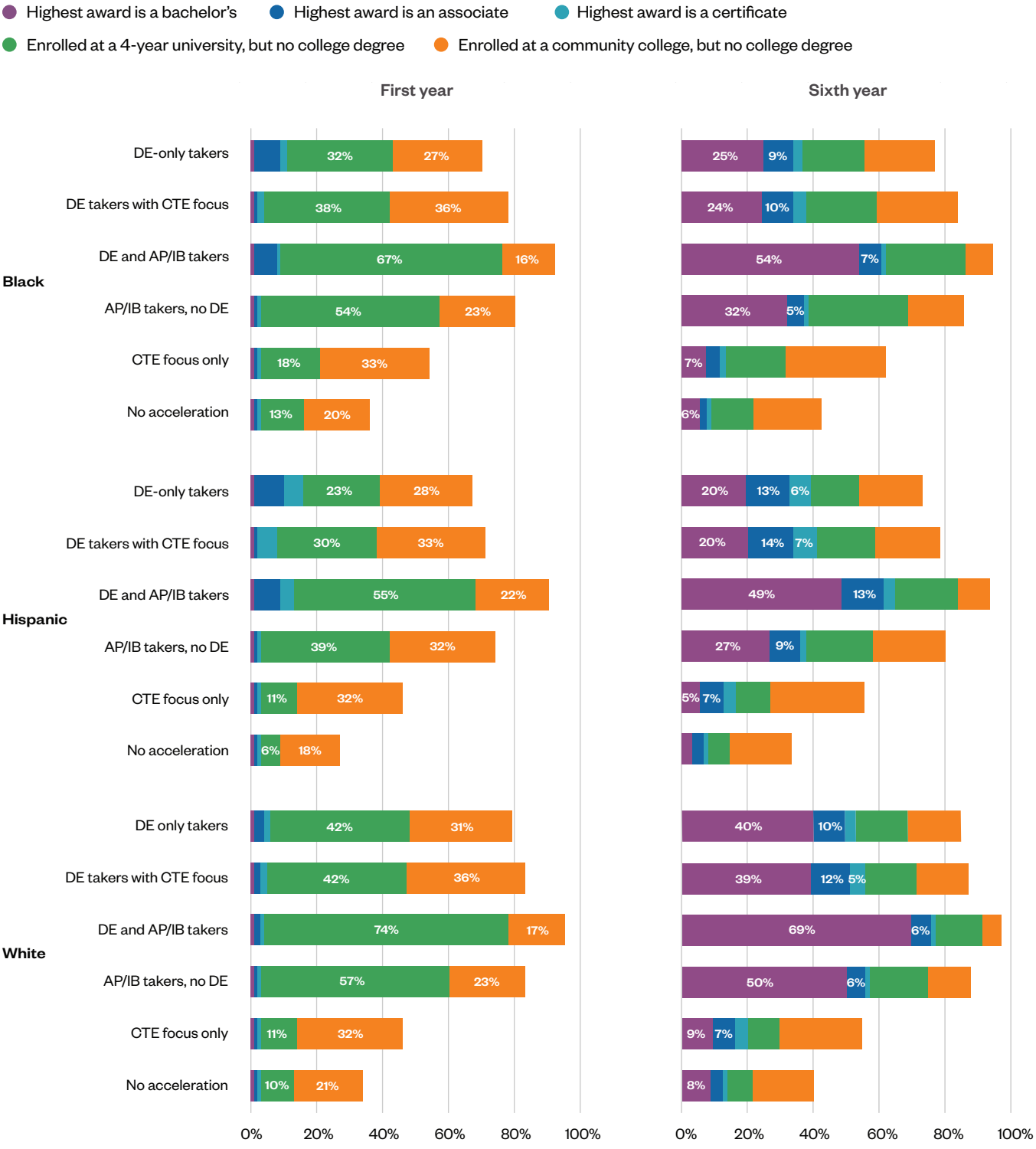
Figure 6 shows the highest postsecondary attainment across coursetaking profiles disaggregated by race/ethnicity. Postsecondary enrollment and attainment rates by coursetaking profile follow the same trends we observe for students overall, namely, that DE takers of all kinds had stronger outcomes than CTE-focus-only and no-acceleration students, with DE-only takers having relatively lower rates and DE and AP/IB takers and AP/IB takers with no DE having the highest enrollment and bachelor's attainment rates. However, we find racial/ethnic gaps in postsecondary outcomes, with Hispanic students having in general the lowest outcomes.

By the first year post high school, we observe gaps in postsecondary enrollment among Black, Hispanic, and White students across different DE coursetaking profiles. Hispanic students generally had lower enrollment and credential attainment rates than Black and White students in the same DE coursetaking profiles, with the exception of their slightly elevated certificate and associate completion rates. Among CTE-focus-only students and students with no accelerated coursework, Black and White students had similar postsecondary enrollments rates, whereas Hispanic students had slightly lower enrollment, particularly at four-year institutions.

By the sixth year post high school, White students had the highest bachelor's completion rate across all coursework profiles, followed by Black students. Hispanic students had the lowest bachelor's completion rate but the highest associate degree completion rate. For example, among DE and AP/IB takers, 69% of White students completed a bachelor's, compared to 54% of Black students and 49% of Hispanic students.

## Figure 6.

**Highest Postsecondary Attainment by Coursetaking Profile and Racial/Ethnic Group**




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Students in the race/ethnicity categories of Asian and Other represent less than 5% of the cohort. To avoid inaccuracies associated with small sample sizes, their postsecondary outcomes by coursetaking profile are not shown.

## What are the earnings trajectories of Texas high school students, and how do accelerated coursetaking profiles shape them?

In this section, we examine the earnings trajectories of Texas public high school students up to six years after expected high school completion, when they were approximately 24 years old. We use Texas Workforce Commission (TWC) data, which captures quarterly earnings for a large portion of Texans employed in the state. These data do not include earnings from tips, military service, federal agency employment, and certain other types of employment not covered by unemployment insurance reporting, including independent contractors or domestic employees under specified earnings thresholds. Among those for whom we observe earnings, we measure average reported non-zero quarterly earnings one, three, and six years after expected high school graduation—all reported in 2023 U.S. dollars. (We correct earnings outliers by top-coding earnings in the 99.5 percentile of the distribution each year.)

The following results describe the earnings trajectories and gaps among coursetaking profiles overall and after accounting for student and high school characteristics. Our analyses do not, however, account for unobserved factors that may influence how students select into different coursetaking profiles and how they select into different occupations. For example, similar students in the same school may receive different information about the advantages of different accelerated coursework and different careers because of factors such as parental resources, which might influence students' coursetaking profile selection as well as their employment and earnings trajectories. Thus, we do not interpret these results as causal returns to each of the coursetaking profiles. For an extended discussion on this topic, see Appendix B.

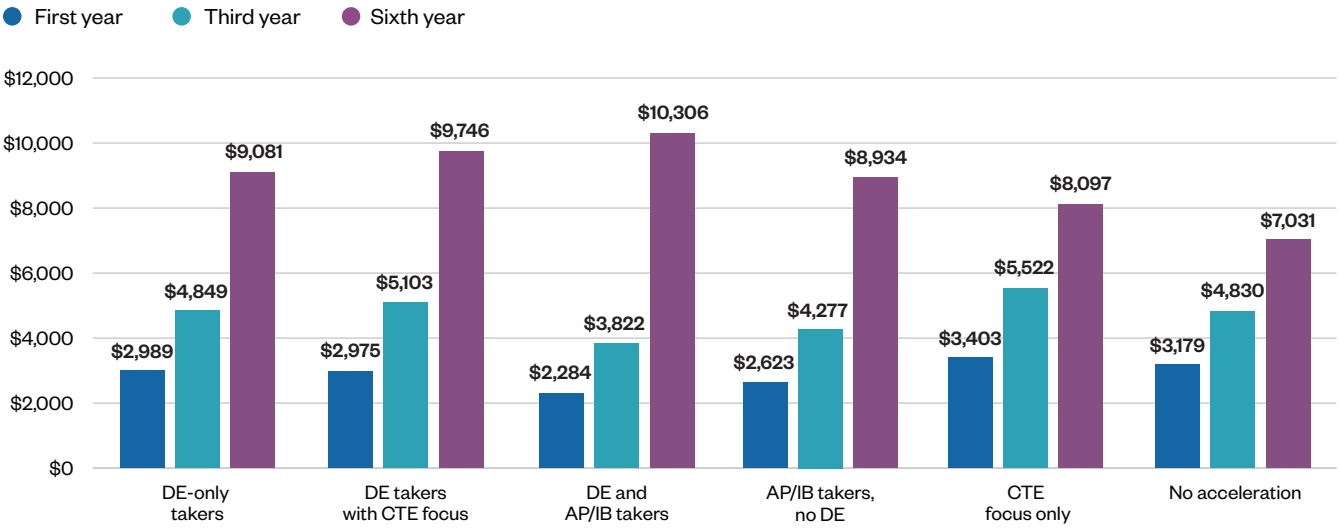
The fact that we do not observe earnings for all Texas high school students is important for the interpretation of our findings. About 70% of students in our sample reported non-zero earnings in their first, third, and sixth year post high school. Among coursetaking profiles, students without accelerated coursework were the least likely to have earnings reported (65%–68% reported non-zero earnings), whereas DE students in general were more likely to report earnings (about 75% did so). See Table B3 in Appendix B for details. Missing data in reported earnings can significantly bias estimates derived from state administrative data, particularly when the lack of data is explained by factors related to student outcomes.[11] We refer to this issue as attrition bias and examine the magnitude and implications of unreported earnings for our analysis in Appendix B. Results displayed in Table B4 suggests that after controlling for student and high school characteristics, the differences in the likelihood of reporting non-zero earnings is relatively small among students with some accelerated coursework (0 to 5 percentage point differences in the probability of reporting earnings, relative to AP/IB takers with no DE) but is larger when compared to students without accelerated coursework (up to 8 percentage point differences relative to DE and AP/IB takers). The fact that students with no accelerated coursework are less likely to have non-zero earnings suggests findings for this specific group should be interpreted with caution, as unreported earnings may lead to over- or underestimating the magnitude of the estimated differences.

**Students with a CTE focus earn more than others in the first three years after high school, but after six years, students with DE or AP/IB are the highest earners.** Earnings grow over time across all coursetaking profiles, with a large jump in earnings especially among DE students from the third to the sixth year post high school (roughly from age

21 to 24). By age 24, DE students in general, and DE and AP/IB takers in particular, earn $2,000 to $3,000 more per quarter than CTE-focus-only students and students with no accelerated coursework, who have the lowest average earnings (see Figure 7). As we elaborate further below, these earnings differences hold after accounting for student and high school characteristics (as shown in Figure 8).

Figure 7 shows the average quarterly earnings of the combined 2015 and 2016 completion cohorts. We present average non-zero earnings in the first, third, and sixth years after high school for each coursetaking profile. In general, earnings grew over time across all profiles, with a large jump in earnings from the third to the sixth year after high school. However, despite higher earnings in the first year among students with a CTE focus only ($3,403) or no accelerated coursework ($3,179) compared with peers in AP/IB and DE (e.g., $2,284 among DE and AP/IB takers), the trend shifted in the sixth year. By that point, DE students in general, and DE and AP/IB takers in particular, earned more than CTE-focus-only students and students with no accelerated coursework (e.g., $10,306 among DE and AP/IB takers compared with $8,097 among CTE-focus-only students).

**Figure 7.**
**Quarterly Earnings by Coursetaking Profile**

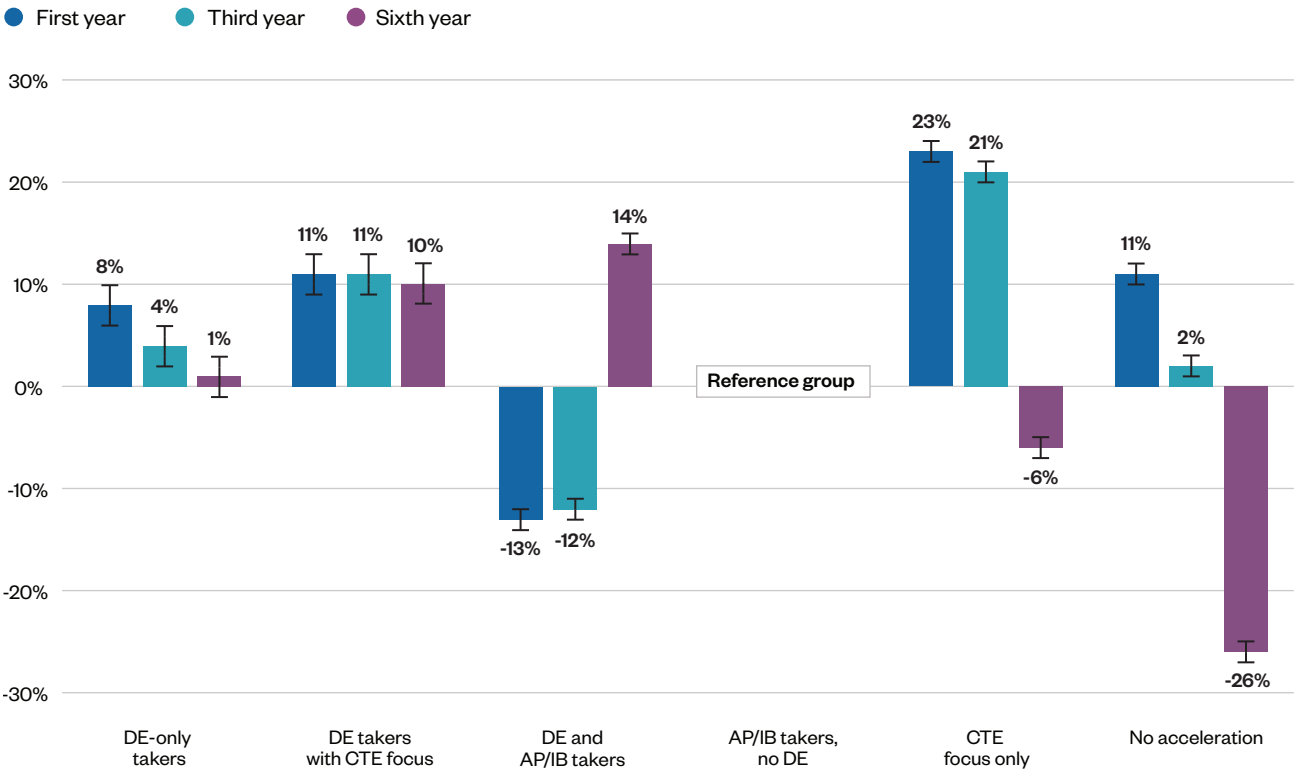



*Note.* Data are from the 2015 and 2016 high school completion cohorts. Results show average non-zero quarterly earnings in the first, third, and sixth year post expected high school completion in 2023 dollars.

In Figure 8, we estimate the earnings gaps among coursetaking profiles, controlling for student demographics, test scores, and high school characteristics. Details about the controls and estimation specification are presented in Appendix B. We compare findings to the AP/IB takers without DE coursetaking group, given that it is the most common college-and-career-acceleration profile.

## Figure 8.

**Regression-Adjusted Differences in Quarterly Earnings by Coursetaking Profile**




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Estimates show the percentage change in non-zero earnings relative to the reference group of AP/IB takers with no DE. Estimates conditional on student gender, low-income status, high school entry cohort, race/ethnicity, standardized TAKS reading and math test scores, student ranking in the high school based on TAKS (top 10% and top 11th to 30th percent), and high school fixed effects. Whiskers indicate 95% confidence intervals. A difference is statistically significant if its confidence interval does not overlap with zero percent.

**Controlling for student and school characteristics, students who take DE, especially in combination with AP/IB or with a CTE focus, have significantly higher earnings by age 24 compared to those with no accelerated coursework and even students with AP/IB or a CTE focus without DE.**

Earnings differences across coursetaking profiles persist after accounting for student and high school characteristics, with students who combined DE with other accelerated coursework having significantly higher earnings by the sixth year after high school than other groups. For example, DE and AP/IB takers had earnings 12–13% lower than AP/IB takers with no DE in the first and third year post high school, whereas CTE-focus-only students had earnings over 20% higher than AP/IB takers with no DE and over 30% higher than DE and AP/IB takers. However, by the sixth year, DE and AP/IB takers were estimated to be earning 14% more than AP/IB takers with no DE, whereas CTE-focus-only students' earnings were 6% lower than AP/IB takers with no DE, and almost 20% lower than DE and AP/IB takers. Notably, students with no acceleration had sixth-year earnings 26% lower than AP/IB takers with no DE and almost 40% lower than DE and AP/IB takers.[12] And DE takers with a CTE focus had consistently higher earnings than AP/IB takers with no DE over the years (10%–11% higher earnings).

## What are the earnings differences by postsecondary completion level?

**Taking DE courses is linked with a significant earnings advantage, even among bachelor's degree completers and after controlling for student background, suggesting that earnings gains associated with DE extend beyond those induced by credential completion. Among students who earn an associate or bachelor's degree, students who take DE, especially in combination with AP/IB or with a CTE focus, have significantly higher earnings than AP/IB takers with no DE and much higher earnings than CTE-focus-only or no-acceleration students of the same degree level.**

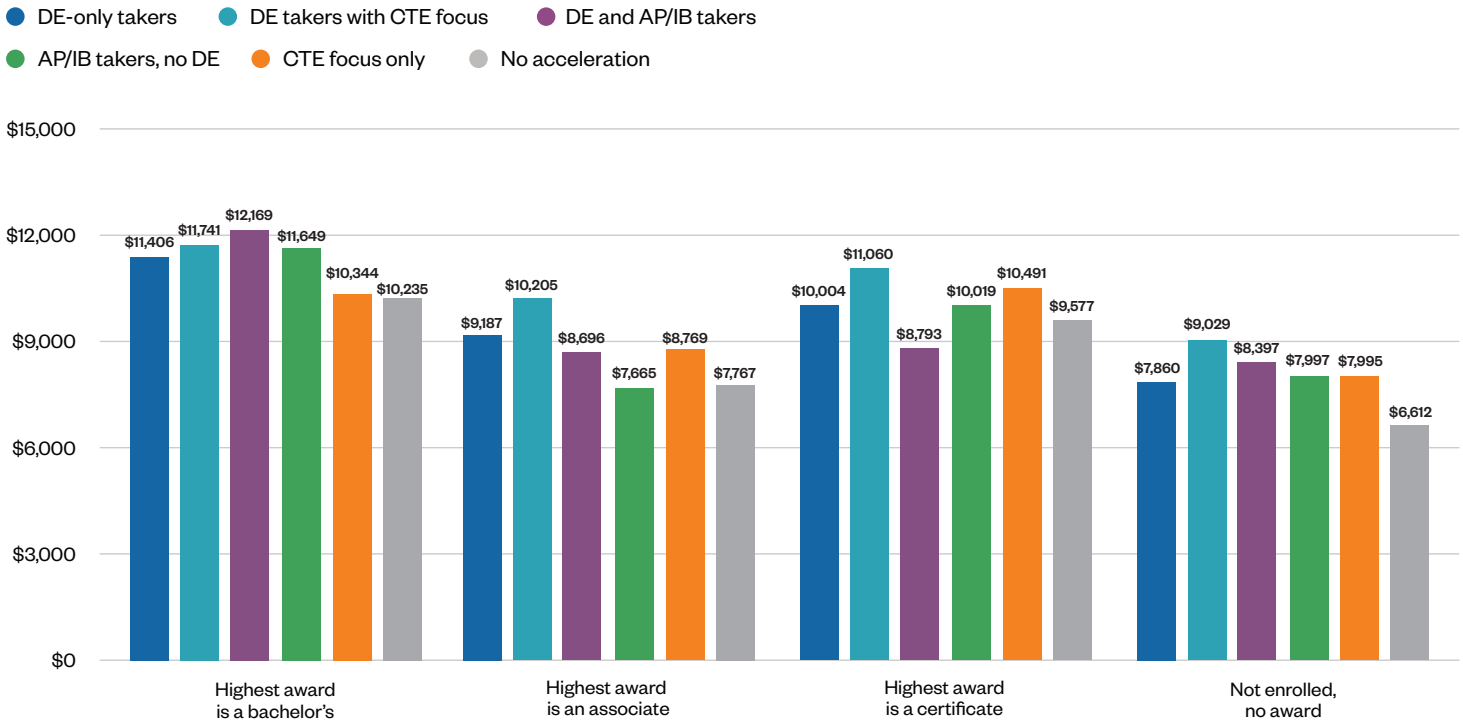
As we have documented, DE students in general have higher postsecondary credential completion rates than non-DE students, albeit similar to those of AP/IB takers with no DE. DE students also have higher credential completion rates—including bachelor's completion rates—within three years post high school than students who do not take DE courses. These findings suggest that earnings differences we observe are driven by differences in postsecondary enrollment and credential completion: DE students are more likely to be enrolled in college within the initial years after high school and are therefore less likely to be working full-time and at their full earnings potential. But by the sixth year, DE students are also more likely to have completed a bachelor's degree, and baccalaureate recipients' earnings are generally higher than those of non-college goers or those still in college. Moreover, if DE students have a faster time-to-credential, they are also entering the labor market with a credential sooner and accumulating more years of experience than other students, which is associated with higher earnings. In this section, to better isolate the role of taking accelerated coursework, we examine—among students with the same postsecondary attainment level—the differences in earnings by coursetaking profile.

Figure 9 shows sixth year earnings by coursetaking profile and highest credential attainment. Across all profiles, students with bachelor's degrees had higher average quarterly earnings than associate degree holders and students without any postsecondary credentials or enrollment.

Students whose highest credential was a certificate also report high earnings, especially among students with a CTE focus and particularly if that CTE focus was combined with DE. For example, among DE takers with a CTE focus, bachelor's degree holders earned $11,741 per quarter on average, whereas certificate holders earned $11,060. Among CTE-focus-only students, bachelor's degree holders earned $10,344 per quarter, whereas certificate holders earned $10,491. The higher earnings for DE takers with a CTE focus are potentially experienced by more students: As shown in Figure 3, the share of DE takers with a CTE focus who completed a bachelor's (32%) or certificate (5%) within six years was higher than attainment of these credentials among CTE-focus-only students (7% and 3%, respectively).

## Figure 9.

**Average Quarterly Earnings in the Sixth Year by Coursetaking Profile and Highest Postsecondary Attainment**




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Results show average non-zero quarterly earnings (in 2023 dollars) in the sixth year post expected high school completion for each coursetaking profile, among students with the same highest credential attained in the previous year.

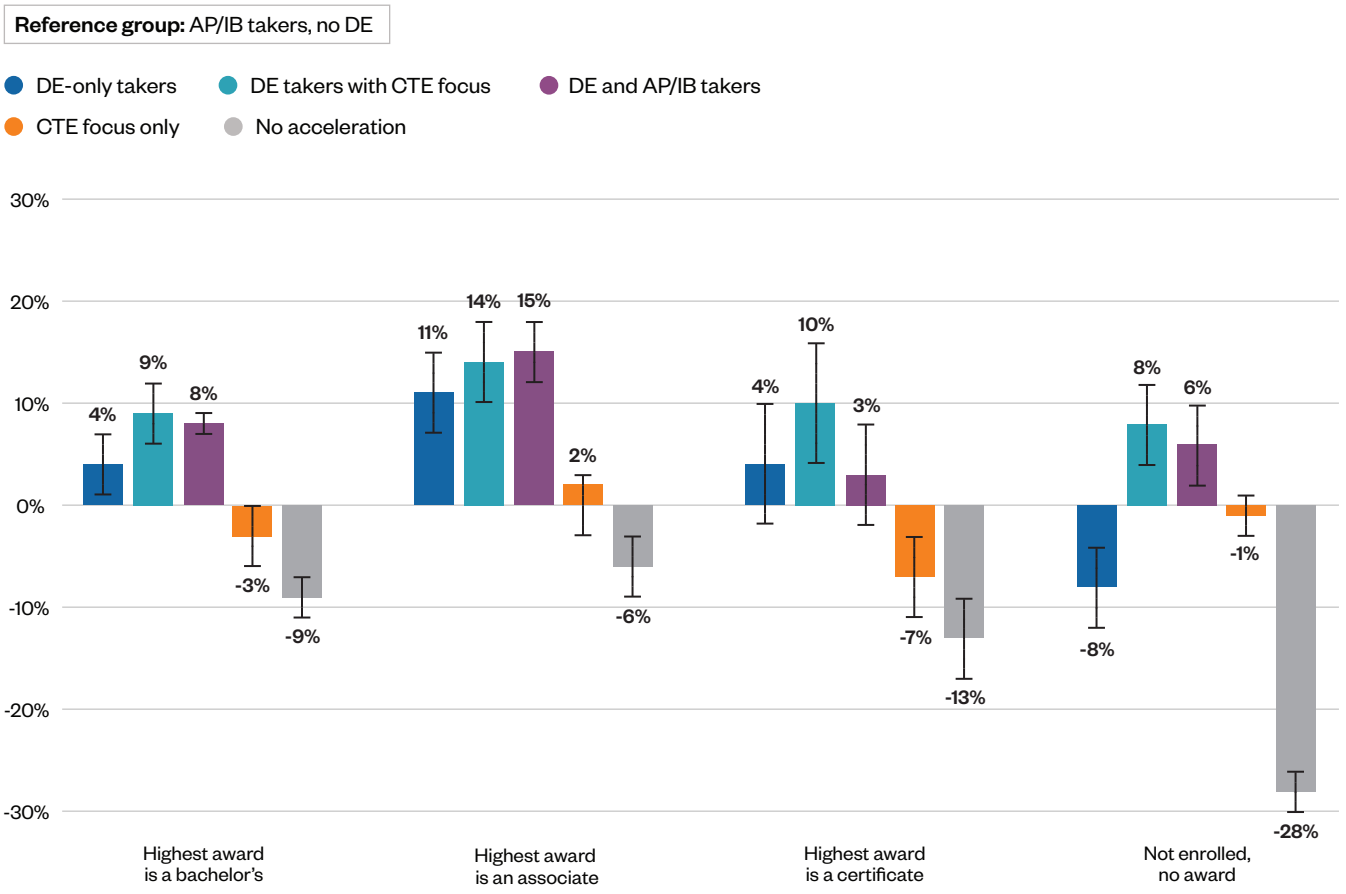
Figure 10 shows differences in sixth-year earnings by coursetaking profiles among students with the same credential attainment while controlling for student and high school characteristics, including student test scores. Again, we use students who took AP/IB courses without DE—the largest acceleration coursetaking profile—as the comparison group. AP/IB takers without DE are also a useful reference point to understand gains associated with DE beyond those of degree completion.

Among associate and bachelor's degree holders, DE students of all kinds had significantly higher earnings than AP/IB students without DE. For associate degree holders, DE students had between 11% and 15% higher earnings (across all three DE groups) compared with AP/IB takers with no DE, whereas among bachelor's degree holders DE students earned between 4% and 9% more than AP/IB takers with no DE. But for DE-only takers without a college credential, estimated earnings were 8% less after six years compared with AP/IB takers with no DE. Recall that DE students in general were more likely to enroll in college and earn a credential than other students; however, DE-only takers had lower enrollment and credential completion rates than AP/IB students without DE (21% of DE-only takers never enrolled in or completed a credential compared with 16% of AP/IB takers without DE).

CTE-focus-only students had no earnings advantage compared with students taking DE or AP/IB, regardless of their postsecondary attainment. And, students with no accelerated coursework had significantly lower estimated earnings than DE students and AP/IB takers, especially among students who never enrolled or earned an award.

## Figure 10.

**Regression-Adjusted Differences in Sixth-Year Quarterly Earnings by Coursetaking Profile and Highest Postsecondary Attainment**




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Estimates show the percentage change in non-zero earnings relative to the reference group of AP/IB takers with no DE with the same highest credential attained in the previous year. Estimates conditional on student gender, low-income status, high school entry cohort, race/ethnicity, standardized TAKS reading and math test scores, student ranking in the high school based on TAKS (top 10% and top 11th to 30th percent), and high school fixed effects. Whiskers indicate 95% confidence intervals. A difference is statistically significant if its confidence interval does not overlap with zero percent.

## Do the overall differences in earnings trajectories by coursetaking profile hold among students in the same gender, income, or racial/ethnic group?

### *Earnings differences by gender*

**The overall pattern of earnings by coursetaking profile holds for both young men and women; the gains associated with a CTE focus are stronger for men, whereas the gains associated with combining DE and AP/IB are stronger for women.** The advantage for men extends to those who do not take DE or AP/IB but who have a high school CTE focus only and subsequently complete an associate degree before the sixth year after high school.

Figures 11–13 show differences in earnings trajectories by coursetaking profile and gender. Men earned more, on average, per quarter than women, regardless of follow-up length or coursetaking profile. The differences in earnings trajectories by coursetaking profile and relative to AP/IB takers with no DE were, in general, larger in magnitude for men than for women even after accounting for student and high school characteristics (Figure 12). By the sixth year post high school, among both men and women, DE and AP/IB takers and DE takers with a CTE focus had higher estimated earnings than AP/IB takers with no DE. Male DE takers with a CTE focus had estimated earnings well over 10% higher than male AP/IB takers with no DE, whereas for women this difference ranged between 7% to 9%. We also find that, unlike the patterns observed among men, female DE-only takers had no statistically significant estimated earnings differences in the sixth year compared with female AP/IB takers with no DE. Men with a CTE focus only also had significantly higher earnings than AP/IB takers with no DE in the first three years after high school and no differences in earnings by the sixth year. Among women, on the other hand, CTE-focus-only students earned significantly less by the sixth year after high school compared with AP/IB takers with no DE. These results are consistent with prior research on gender differences in career pathways. Men with a CTE focus are likely to earn associate degrees and certificates in CTE-oriented fields, which are generally associated with higher earnings compared with liberal arts or general studies majors (Jenkins et al., 2025). Similarly, male students tend to gravitate toward programs in STEM; agriculture, food, and natural resources; architecture and construction; and manufacturing and transportation industries; whereas women are disproportionately concentrated in education and training, health sciences, and human services, which tend to exhibit lower associated earnings (Dougherty, 2016; Jenkins et al., 2025).

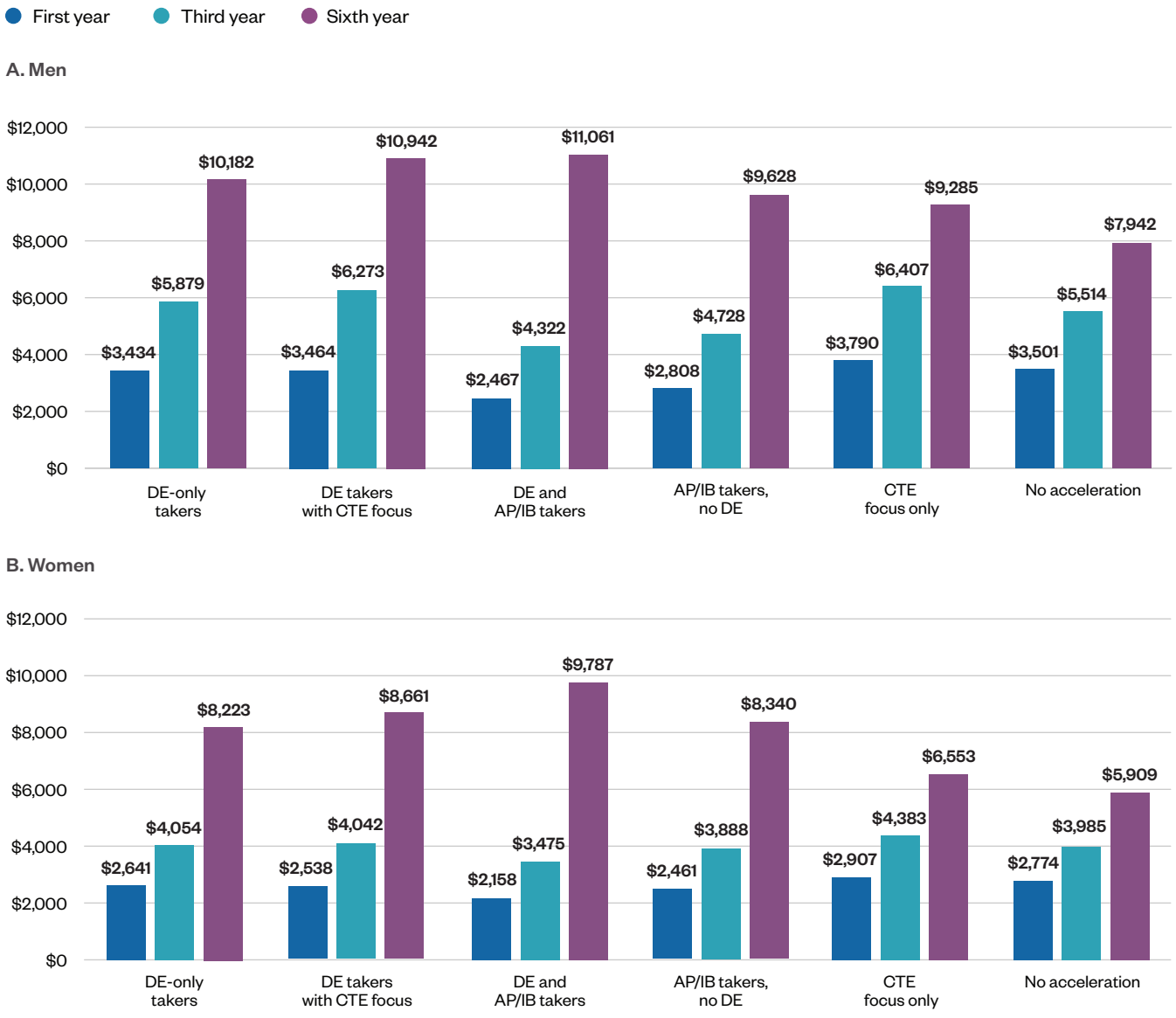
To further understand earnings associated with college-and-career-accelerated coursework, we conducted a separate analysis focusing on low-income students and examining earnings differences by gender and found similar results (see Appendix Figures A17–19).

Figure 13 shows the regression-adjusted sixth-year earnings differences across coursetaking profiles and among students with the same highest postsecondary attainment. Men who took DE credits with a CTE focus had higher estimated earnings than male AP/IB takers without DE, regardless of their credential attainment, and higher earnings from any accelerated coursework when their highest credential was a certificate. Women who took

DE alone or in combination with AP/IB or with a CTE focus also had higher estimated earnings than women who took AP/IB without DE when their highest credential was a certificate. This is consistent with the differences in career trajectories between men and women discussed earlier.

**Figure 11.**

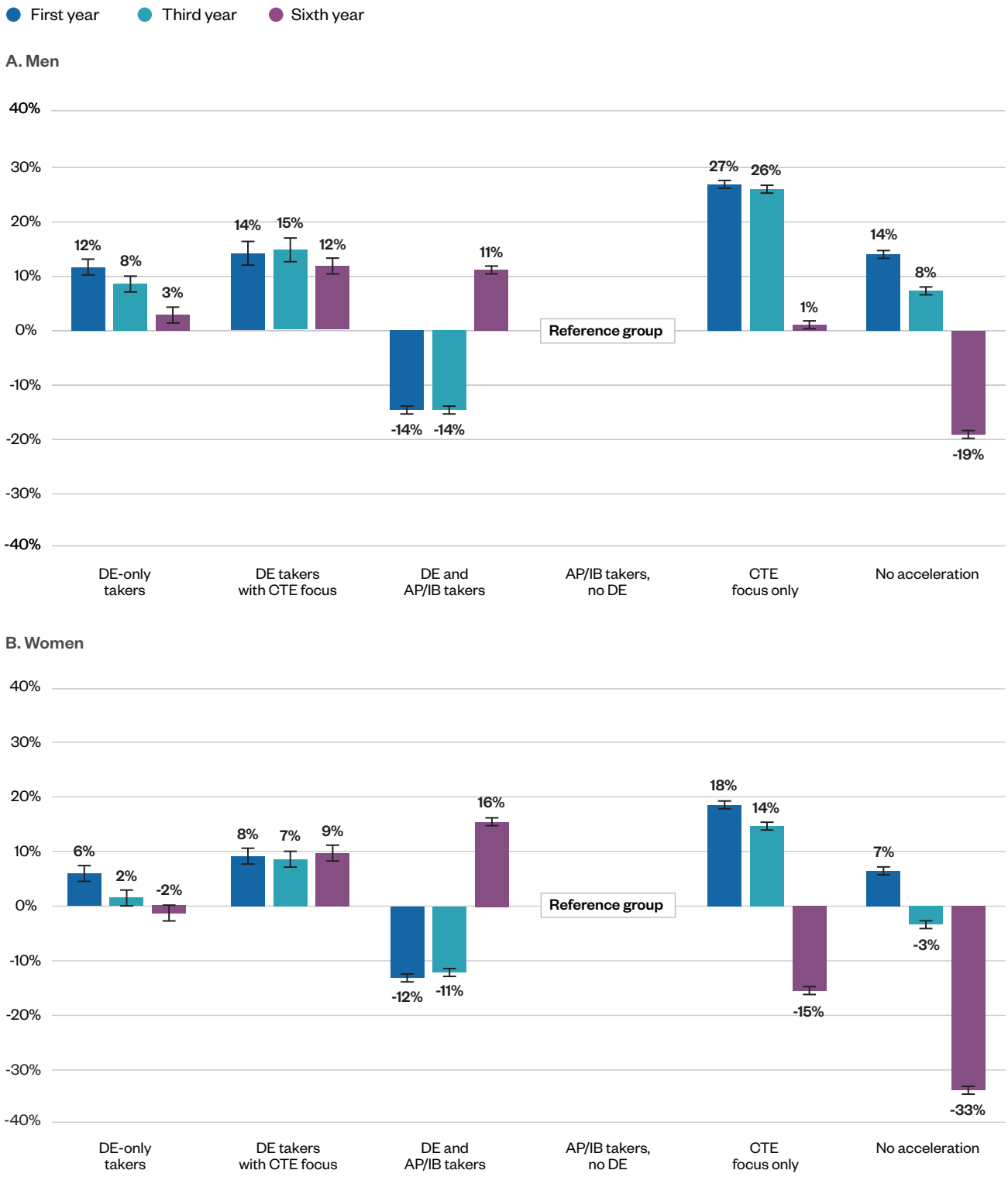
**Quarterly Earnings by Coursetaking Profile**




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Results show average non-zero quarterly earnings in the first, third, and sixth year post expected high school completion in 2023 dollars.

## Figure 12.

**Regression-Adjusted Differences in Quarterly Earnings by Coursetaking Profile and Gender**




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Estimates show the percentage change in non-zero earnings relative to the reference group of AP/IB takers with no DE. Estimates conditional on student low-income status, high school entry cohort, race/ethnicity, standardized TAKS reading and math test scores, student ranking in the high school based on TAKS (top 10% and top 11th to 30th percent), and high school fixed effects. Whiskers indicate 95% confidence intervals. A difference is statistically significant if its confidence interval does not overlap with zero percent.

## Figure 13.

**Regression-Adjusted Differences in Sixth-Year Quarterly Earnings by Coursetaking Profile, Highest Postsecondary Attainment, and Gender**

**Reference group:** AP/IB takers, no DE

DE-only takers
DE takers with CTE focus
DE and AP/IB takers
CTE focus only
No acceleration


*Note.* Data are from the 2015 and 2016 high school completion cohorts. Estimates show the percentage change in non-zero earnings relative to the reference group of AP/IB takers with no DE with the same highest credential attained in the previous year. Estimates conditional on student low-income status, high school entry cohort, race/ethnicity, standardized TAKS reading and math test scores, student ranking in the high school based on TAKS (top 10% and top 11th to 30th percent), and high school fixed effects. Whiskers indicate 95% confidence intervals. A difference is statistically significant if its confidence interval does not overlap with zero percent.

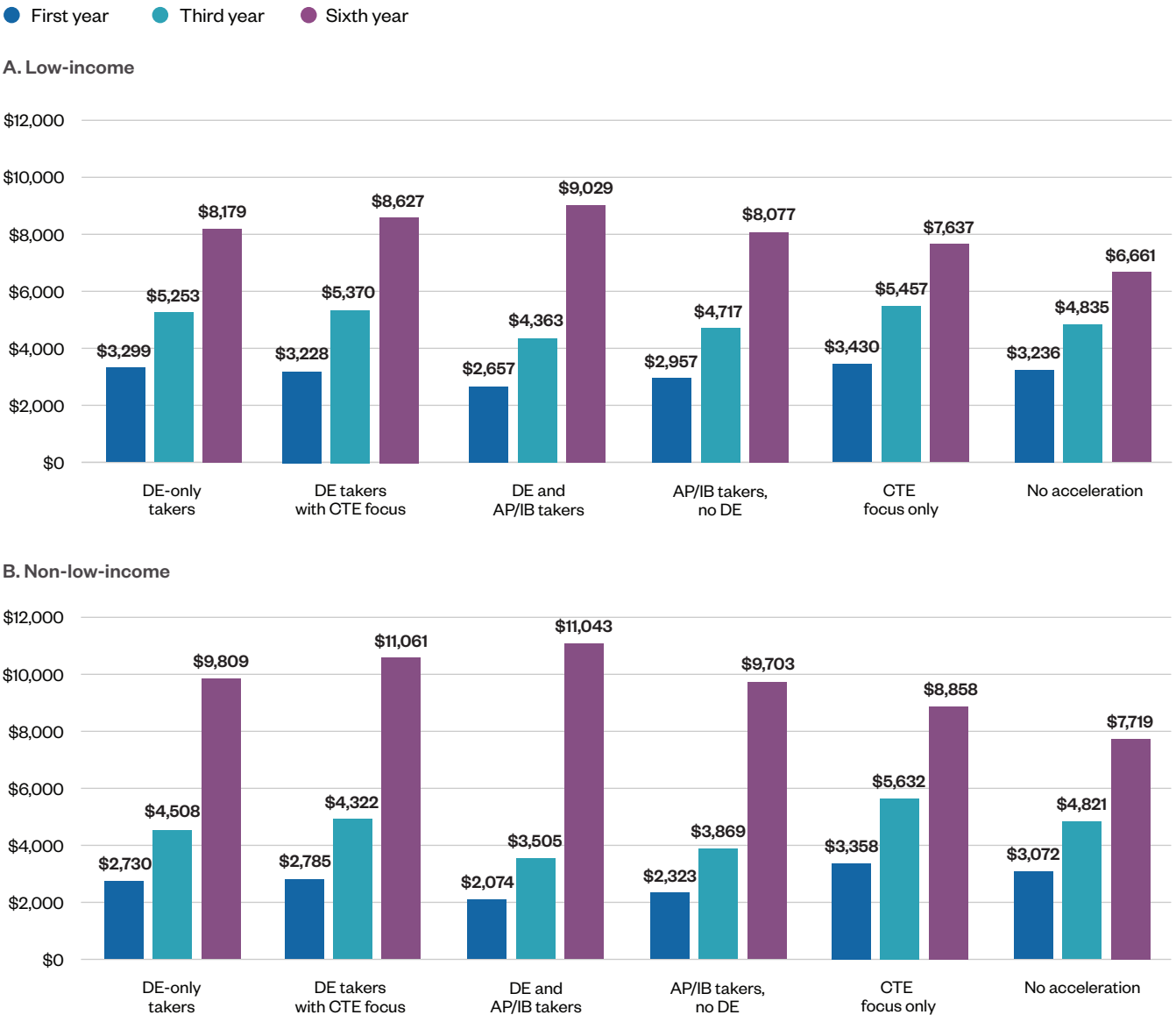
## *Earnings differences by Income*

**The overall pattern of earnings is very similar for low-income high school students as for non-low-income students, though the earnings are smaller in magnitude.** Six years after high school, students who take DE with a CTE focus have associated earnings that are between 7% and 11% higher than those of AP/IB takers with no DE, for both low-income and non-low-income groups. Notably, the gains associated with dual enrollment among students who attain the same credential tend to hold better among non-low-income students than low-income students, which suggests that gains associated with DE beyond degree completion are not as pronounced for low-income students.

Figures 14–16 show differences in earnings trajectories by coursetaking profile and income status. Students who took DE with a CTE focus had consistent earnings gains relative to AP/IB students without DE throughout the six years post high school regardless of income status, although non-low-income students had a small advantage compared to low-income students (the gains were 7%–9% among low-income students, versus 11%–12% among non-low-income students). Low-income students with a CTE focus only had less of an immediate earnings bump after high school compared with non-low-income students (15%, 13% and -6% in the first, third, and sixth year for low-income students, compared to 31%, 30%, and -6% for non-low-income students), though their earnings advantage similarly reverses by the sixth year after high school compared with AP/IB takers with no DE. In examining earnings differences among students with the same credential, we find that the gains for DE takers with a CTE focus lose magnitude and significance for low-income students who hold a certificate, associate degree, or bachelor's degree but persist among non-low-income students (e.g., among non-low-income bachelor's degree holders, students who took DE with a CTE focus earned 12% more than students who took AP/IB without DE; whereas among the low-income students, there was no difference in earnings). Among low-income students who earned the same credential, we find earnings gains for those who combined DE with AP/IB courses (14% higher average earnings among associate degree holders, and 7% higher among bachelor's degree holders).

## Figure 14.

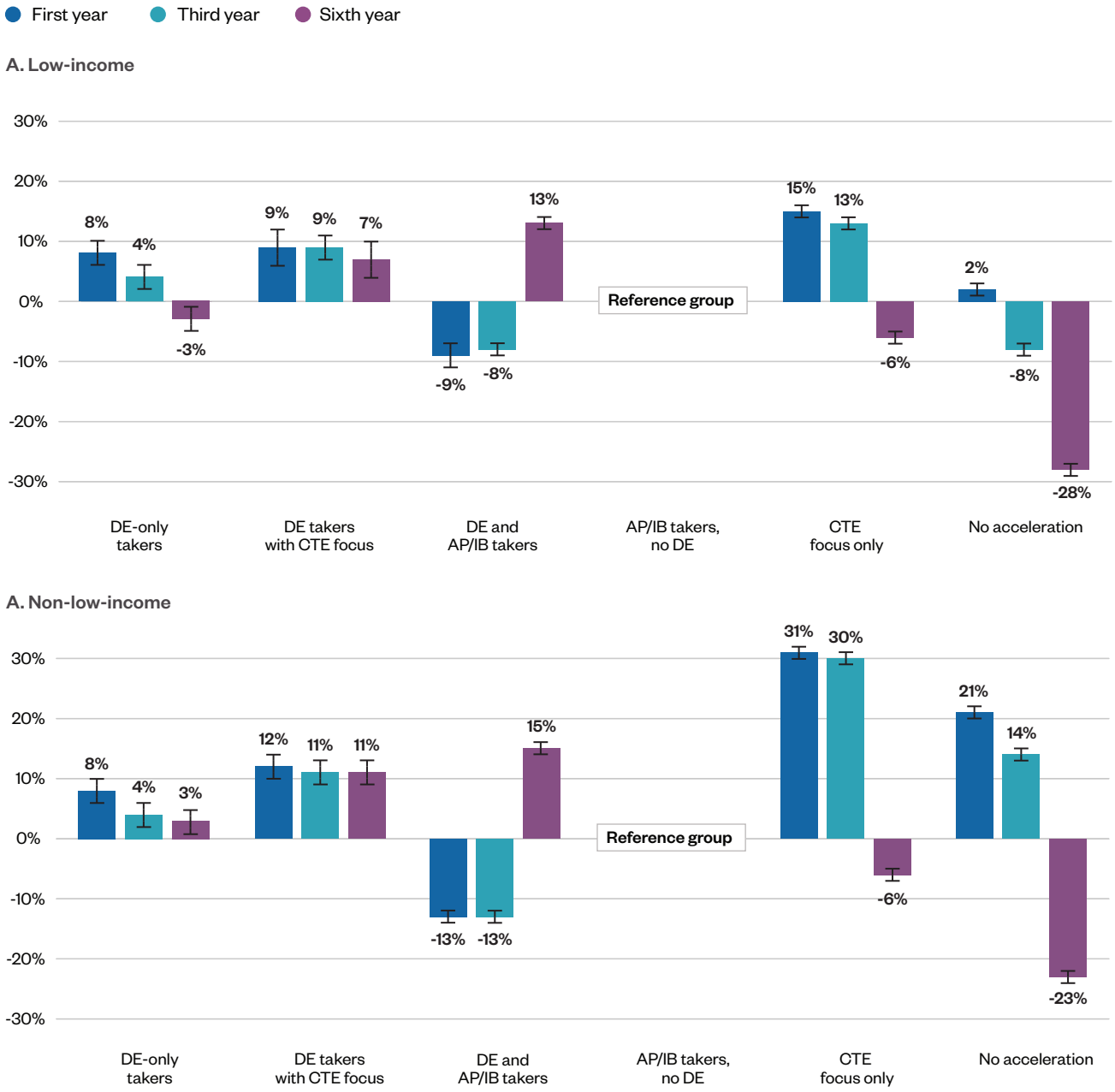
**Quarterly Earnings by Coursetaking Profile and Income Status**




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Results show average non-zero quarterly earnings in the first, third, and sixth year post expected high school completion in 2023 dollars.

## Figure 15.

**Regression-Adjusted Differences in Quarterly Earnings by Coursetaking Profile and Income Status**



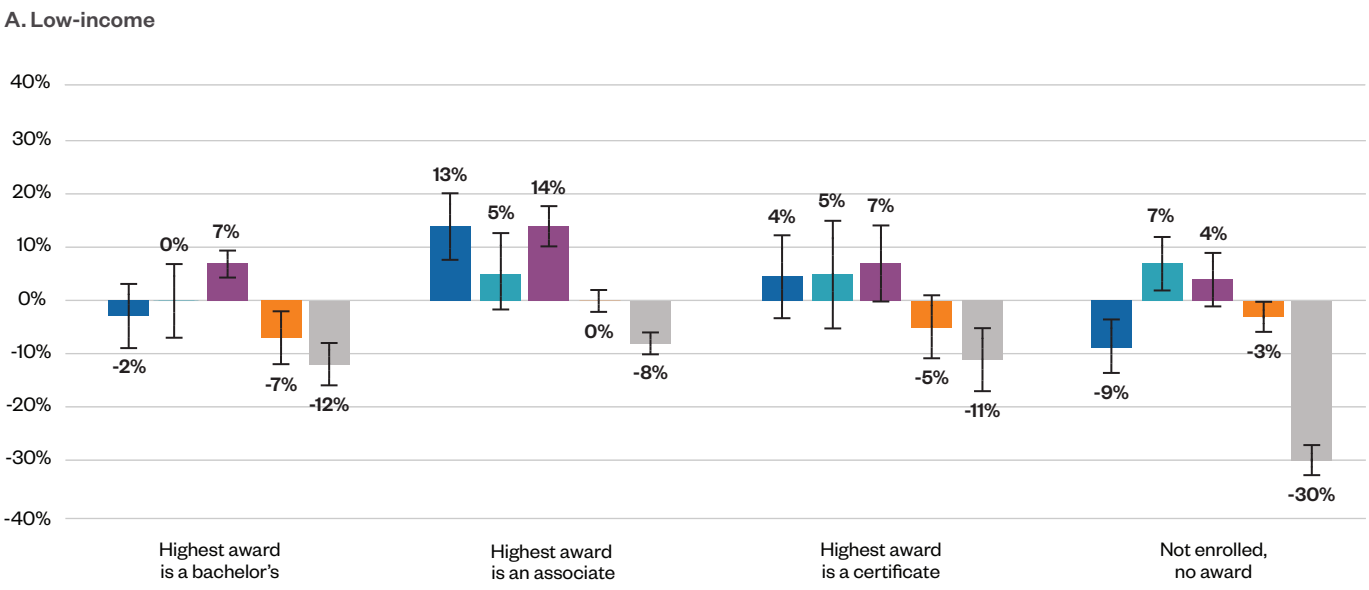

*Note.* Data are from the 2015 and 2016 high school completion cohorts. Estimates show the percentage change in non-zero earnings relative to the reference group of AP/IB takers with no DE. Estimates conditional on student gender, high school entry cohort, race/ethnicity, standardized TAKS reading and math test scores, student ranking in the high school based on TAKS (top 10% and top 11th to 30th percent), and high school fixed effects. Whiskers indicate 95% confidence intervals. A difference is statistically significant if its confidence interval does not overlap with zero percent.

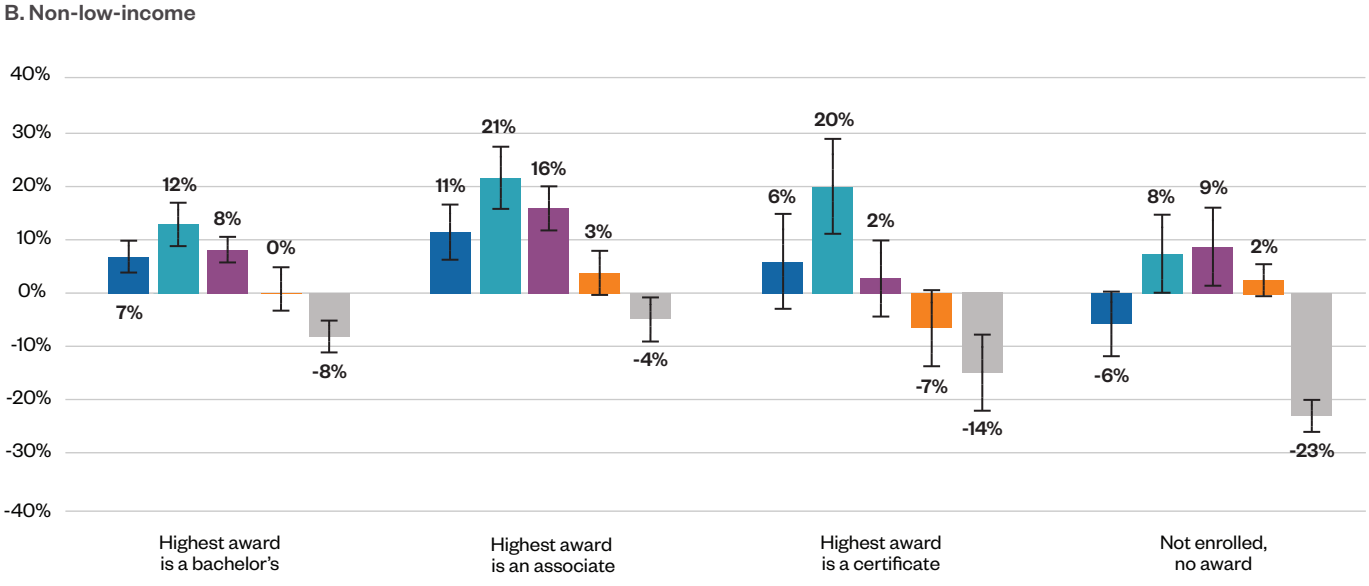
## Figure 16.

**Regression-Adjusted Differences in Sixth-Year Quarterly Earnings by Coursetaking Profiles, Highest Postsecondary Attainment, and Income Status**

**Reference group:** AP/IB takers, no DE

DE-only takers | DE takers with CTE focus | DE and AP/IB takers | CTE focus only | No acceleration




*Note.* Data are from the 2015 and 2016 high school completion cohorts. Estimates show the percentage change in non-zero earnings relative to the reference group of AP/IB takers with no DE with the same highest credential attained in the previous year. Estimates conditional on student gender, high school entry cohort, race/ethnicity, standardized TAKS reading and math test scores, student ranking in the high school based on TAKS (top 10% and top 11th to 30th percent), and high school fixed effects. Whiskers indicate 95% confidence intervals. A difference is statistically significant if its confidence interval does not overlap with zero percent.

### *Earnings differences by race/ethnicity*

We also examine differences in earnings by coursetaking profile across student race/ethnicity. As we did for male and female students and low-income and non-low-income students, we compare average earnings gains among students from the same racial/ethnic group conditional on student and school characteristics, over time and among students with the same highest postsecondary attainment. Results follow the same trends we observe for students overall and low-income students. Figures detailing earnings differences are available in Appendix A, Figures A11–A16.

**Compared with Black AP/IB takers with no DE, Black DE takers with a CTE focus have significantly higher earnings across all years and among bachelor's degree completers; however, Black students have lower average earnings than students overall.** Among bachelor's completers, Black DE takers with a CTE focus have a significant earnings gain of 24% compared with Black AP/IB takers with no DE. Conversely, Black DE-only takers have earnings 16% lower than Black AP/IB takers with no DE. Black students with no acceleration have significantly lower earnings than Black AP/IB takers with no DE, regardless of their postsecondary attainment.

**Hispanic DE and AP/IB takers have stronger earnings than Hispanic students who do not take those courses, but their earnings are lower across the board compared to students overall.** Like low-income and Black students, Hispanic students have lower average earnings over their six years post high school than we observe among all students. Among Hispanic students with a certificate, DE takers with a CTE focus have higher earnings than AP/IB takers with no DE. Among Hispanic students, DE and AP/IB takers have significantly higher earnings compared with AP/IB takers with no DE; this is the case among students with a certificate, associate degree, or bachelor's degree.

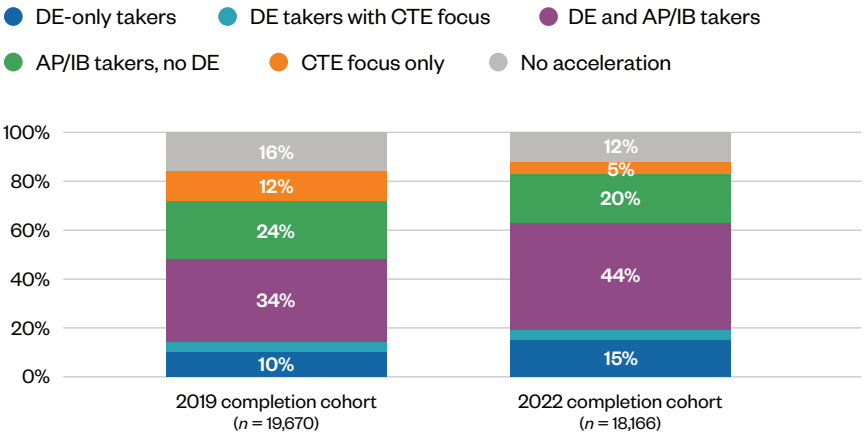
## What are the accelerated coursetaking patterns and post-high-school trajectories of ECHS students?

In this section, we provide an overview of the college-and-career-accelerated coursetaking profiles, postsecondary enrollments, and earnings of the students in Early College High Schools. Recall that identifiers of ECHS students—who represented 5% of all Texas students at the time—were available in the data beginning only in the 2019 cohort. Thus, we present post-high-school trends up to three years from expected high school completion.

**The majority of ECHS students take some form of college-and-career-accelerated coursework, the most popular being a combination of DE and AP/IB.** Having a CTE focus, alone or in combination with DE, is less prevalent among ECHS students compared with all students.

Figure 17 focuses on students in the ECHS track among the 2019 and 2022 high school completion cohorts, illuminating which coursetaking profiles were most prevalent among this select group of students. Participation in college-and-career-accelerated coursework grew over time; the share of students with no accelerated courses decreased from 16% in 2019 to 12% in the 2022 cohort. Nearly half of students in the 2019 cohort (48%) and more than half of those in the 2022 cohort (62%) took DE courses, mostly in combination with AP/IB. Fewer than 5% of students were DE takers with a CTE focus, and the proportion of CTE-focus-only students decreased over time, going from 12% to 5%. The proportion of students who took AP/IB courses with no DE also decreased modestly, from 24% to 20%. Appendix Tables A3–A5 show that ECHS students were disproportionately Hispanic and low-income.

**Figure 17.**
**Distribution of Accelerated Coursetaking by ECHS Students**




*Note.* There were 362,273 and 374,515 students in the 2019 and 2022 high school completion cohorts, respectively. The n values in the labels represent the number of students in ECHS in each cohort.

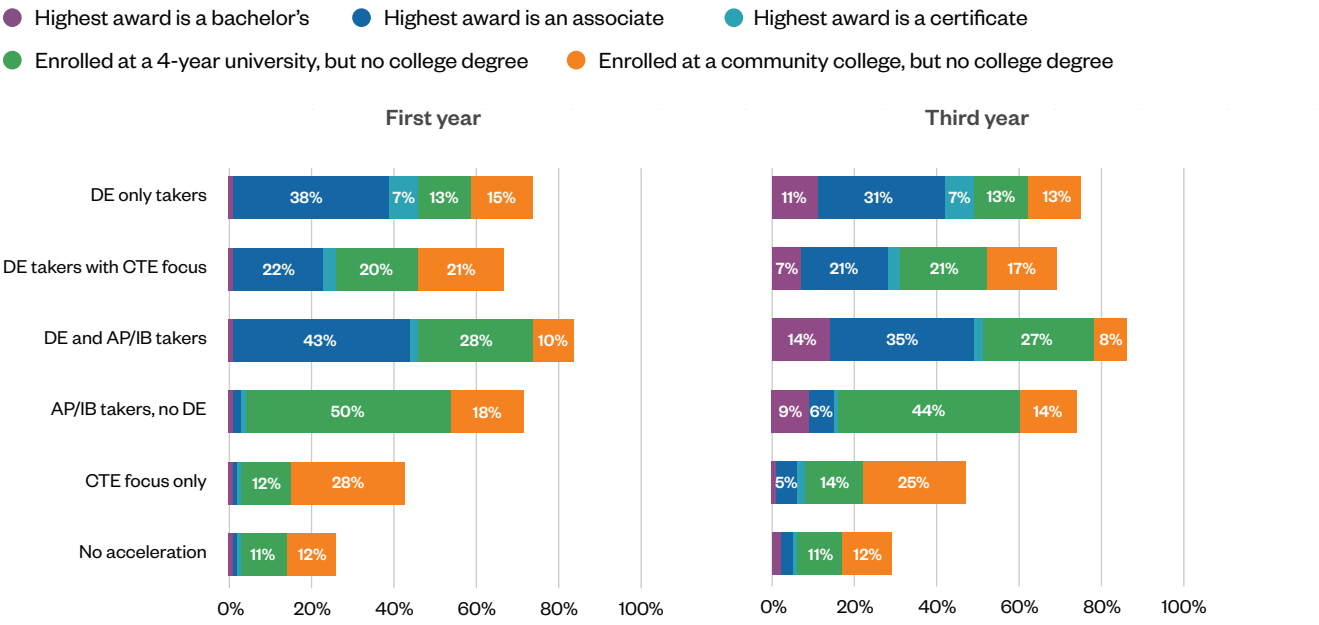
**Credential attainment by the third year after high school is high among ECHS DE-only takers, DE takers with a CTE focus, and DE and AP/IB takers.** A third to a half of ECHS DE students of all kinds earn a credential, with more than 20% earning an associate degree. The earnings of ECHS students within three years post high school are much higher than those we find for students overall.

Figure 18 shows the highest degree attainment shares among students in the ECHS track by coursetaking profile. By the first year after expected high school completion, ECHS-track DE students of all kinds (DE-only takers, DE takers with a CTE focus, and DE and AP/IB takers) and AP/IB takers with no DE had similarly high postsecondary enrollment rates. Yet DE students earned associate degrees at much higher rates. Among DE and AP/IB takers, 43% of students earned an associate degree, and another 38% were enrolled either at a four-year or community college. Among DE-only takers, 38% completed an associate degree, which was higher than the rate among DE takers with a CTE focus (22%). ECHS-track CTE-focus-only students and no-acceleration students had postsecondary enrollment rates below that of students in the rest of coursetaking profiles, and these students had much lower postsecondary completion rates three years after high school.

By the third year after high school, ECHS-track DE students of all kinds had bachelor's degree completion rates of 7% to 14%, with the highest rate among DE and AP/IB takers. AP/IB takers with no DE had a bachelor's completion rate of 9% and much lower associate degree completion, at 6%.

**Figure 18.**

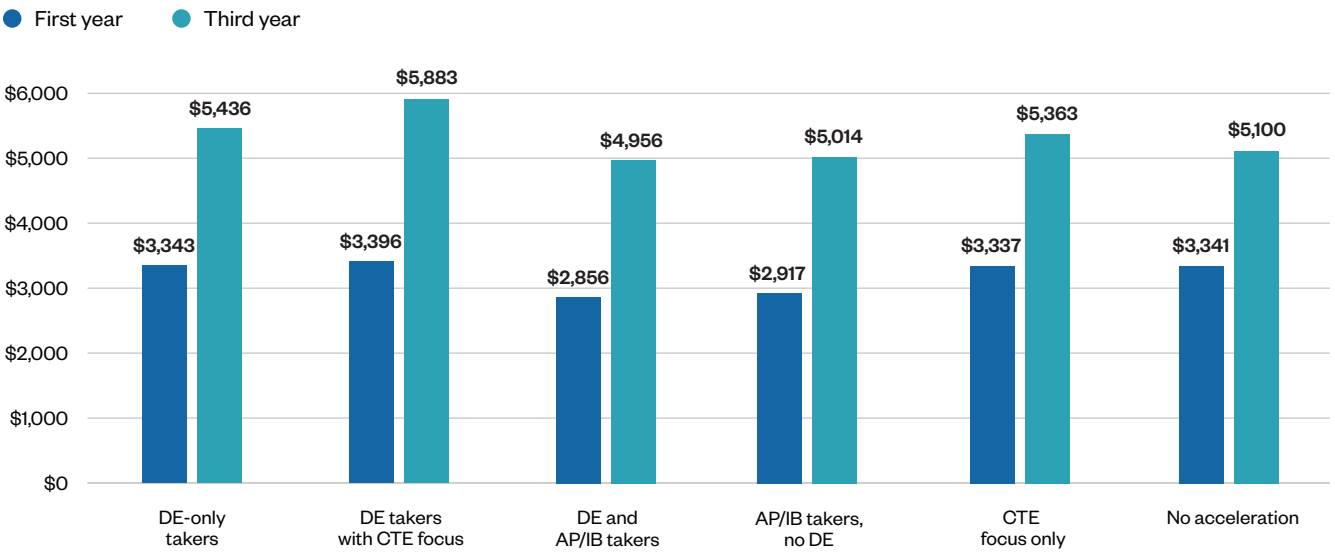
**Highest Postsecondary Attainment of ECHS Students by Coursetaking Profile**




*Note.* Data are from the 2019 high school completion cohort.

Lastly, we examine the early earnings trajectories of ECHS students by coursetaking profile. Figure 19 displays average quarterly earnings by the first and third year from expected high school completion for ECHS-track students in the 2019 cohort. ECHS students exhibited higher average quarterly earnings than students overall, especially in the third year after high school (see Figure 7[13]). For example, after three years, ECHS-track DE and AP/IB takers earned, on average, $4,956 compared with $3,822 among all students. Among ECHS students, DE takers with a CTE focus earned $5,883 compared with the average earnings of $5,103 for the same subset of all students. This is consistent with our earlier findings about the credential attainment of DE students in the ECHS track, where ECHS students earned credentials—especially associate degrees—at much higher rates than students overall.[14]

**Figure 19.**
**Quarterly Earnings of ECHS Students by Coursetaking Profile**




*Note.* Data are from the 2019 high school completion cohort. Results show average non-zero quarterly earnings in the first and third year post expected high school completion in 2023 dollars.

# Explaining These Findings

This report shows how influential different kinds of college-and-career-accelerated coursetaking can be for students' college attainment and earnings trajectories post high school. While our study is the first to analyze a variety coursetaking profiles (in light of how students combine accelerated coursework), our results align well with what prior evidence has found to be the impact of AP, high school CTE, DE, and ECHS.

- **Accelerated coursework, particularly DE, is associated with stronger postsecondary and earnings outcomes in general, but especially relative to students who do not take any AP/IB courses or those without a CTE focus.** Our findings on the advantages associated with DE alone align well with previous literature. There is an extensive body of experimental and quasi-experimental evidence consistently documenting the positive impact of dual enrollment participation—taking at least one college-level course while in high school—on students' postsecondary enrollment, degree attainment, and shortened time to degree completion (see literature reviews by IES [2017] and Schaller et al. [2023]), and on earnings (Henneberger et al., 2020). When implemented well, DE can help students who might not otherwise go to college aspire to do so, and apply to, enroll in, and complete a credential at a postsecondary institution (Fink & Jenkins, 2023). The fact that DE students are in general more likely to earn a bachelor's degree within three years post high school also suggests that DE students are able to successfully transfer and apply many of their DE credits toward bachelor's degree programs.

- **AP/IB coursework alone is associated with strong postsecondary and earnings trajectories, but outcomes are even stronger for students who combined AP/IB with DE.** Our results on higher credential attainment for students who take AP courses are well aligned with previous quasi-experimental research on the effects of AP coursework (Evans, 2018; Smith et al., 2017) and with prior research examining the postsecondary outcomes of students who take AP and DE, showing that both AP and DE are associated with higher enrollment at four-year institutions and higher chances of completing a bachelor's degree (Speroni, 2011; Wyatt et al., 2015). The stark differences in representation among AP/IB takers overall, and among AP/IB and DE takers in particular, are also consistent with barriers to access that are associated with AP participation (Owen, 2024). AP courses have no formal eligibility requirements, but students must pass an AP exam in order for those credits to be transferable to college. In the case of DE, to take academic DE coursework, Texas students typically must meet college readiness standards on the state standardized tests, although students can take CTE DE courses without meeting those requirements (Texas Higher Education Coordinating Board, 2018). But while both AP and DE generally involve some selectivity barriers, our analyses that control for student characteristics—which include standardized test scores—suggest that combining DE with AP (or IB) can amplify the benefits of each form of accelerated coursework. Ultimately, DE can shorten the time to degree completion for AP/IB students, leading to earlier entry to good jobs and higher earnings over time.

- **A high school CTE focus is associated with short-term earnings gains, but students who add DE to a CTE focus have sustained earnings gains by age 24 as well as increased chances of bachelor's completion.** Prior research has found that CTE participation increases students' certificate and associate degree completion, as well as their earnings right after high school (Dietrich et al., 2017; Dougherty et al., 2019; Lindsay et al., 2024; Plasman et al., 2017; Stevens et al., 2019). Research also finds large variation in earnings outcomes by gender and field of degree completion, which is consistent with male CTE students' greater likelihood of completing certificates and associate degrees in workforce-oriented fields rather than in general studies or liberal arts, programs associated with lower earnings (Jenkins et al., 2025; Soliz, 2023). Our results suggest that DE offers a path to CTE-focus students for sustained gains in both their postsecondary trajectories and their earnings. The fact that DE takers with a CTE focus not only show sustained earnings gains throughout their mid-20s but are also more likely than students with a CTE focus only to earn a bachelor's degree suggests a promising pathway for expanding the advantages of CTE.

- **Early College High School represents a small share of the Texas public high school population. ECHS students are disproportionately drawn from underrepresented groups, and they exhibit strong postsecondary and earnings outcomes by the third year post high school.** Several experimental and observational students have documented the much higher college enrollment and associate degree completion rates of ECHS students (Berger et al., 2013; Edmunds et al., 2020; Song et al., 2021, 2024). Our results suggest similar trends for Texas students, at least until the third year post high school completion, which is the latest year we are able to track in the data. While these results are promising, how the gains from ECHS participation will fare compared to those of other Texas students taking similar college-and-career-accelerated coursework is yet to be known. Future research should examine the earnings of ECHS students by age 24 and the roles that field of study and bachelor's

degree attainment play in explaining these differences. It is worth emphasizing that the extent to which these students can continue to have an earnings advantage by age 24 depends on whether participating in ECHS can also help increase students' chances of earning a bachelor's degree, and on the extent to which the associate degrees earned are in fields with high earnings potential. Prior research indicates that the associate of arts degree in liberal or general studies, which is the focus of most ECHS programs in Texas, is associated with relatively low earnings (Jenkins et al., 2025) and that nationwide low transfer rates from community college to four-year institutions can hamper these students' chances of earning a bachelor's degree (Velasco et al., 2024).

## Recommendations for Policy and Practice

The several years after high school are an especially formative time when individuals' educational and earnings trajectories can lead to vastly different economic outcomes in their 30s and beyond. Based on an analysis of multiple cohorts of Texas public high school students, we find that college-and-career-accelerated coursework that students take in high school is associated with greater postsecondary success and earnings in the six years after high school, but that large gaps in participation persist. Drawing both on the study's findings illustrating the potential benefits of accelerated courses as well as overall participation rates and differences by student group, we offer the following policy and practice recommendations to further strengthen DE and other accelerated coursework as an on-ramp to college and career opportunity for students after high school.

1. **Expand dual enrollment participation.** Given the association between taking DE and postsecondary success and higher earnings after high school, and the large gap in participation and outcomes relative to students taking AP/IB without DE, students with a CTE focus alone, and students taking no accelerated coursework at all, Texas colleges and K-12 schools should explore strategies to expand participation and reach more students who could benefit the most from DE. Today, only about one fifth of Texas high school students take DE courses. There seems to be scope to increase participation, particularly among students who take no acceleration courses or students in CTE-focused tracks alone. About half of Texas high school students do not take any AP/IB or DE courses, and nearly half of these do not have a CTE focus (defined in our report as taking 10 or more CTE courses). As shown in this report, there are large, untapped segments of the high school population who could benefit from college and career acceleration, including large proportions of students who historically have not been well served in the high-school-to-college-and-career transition.

   Texas House Bill 8 provided DE funding for low-income high school students and represents an important investment in expanding access to DE (Dey, 2025). States can expand access to DE by removing out-of-pocket costs for students, rethinking overly restrictive eligibility requirements, and setting statewide goals for participation (Steiger et al., 2023). Colleges and high schools implementing DE can expand access by increasing outreach to underserved schools and communities to share information about DE coursetaking and how it aligns to postsecondary and career opportunities (Fink et al., 2023).

2. **Complement—rather than compete with—AP/IB.** Dual enrollment and Advanced Placement are the largest programs offering high school students early college coursework nationally and in Texas. In fact, we find that many students combine AP/IB and DE coursetaking. Instead of thinking of these programs as distinct, policymakers and practitioners should work to better integrate these and related CTE offerings to increase the overall number of students who can gain access to one or more types of college-and-career-accelerated courses. Ideally, college and K-12 partners can weave together different course types to maximize the number of graduating high school students getting a boost into college programs and careers in fields of interest.

3. **Expand access to dual enrollment for CTE.** We find a substantial advantage on both postsecondary attainment outcomes and earnings for students who combined DE with a CTE focus in high school compared with CTE-focus students without DE coursework. Given the growing interest in career-focused postsecondary education among students and policymakers, college and K-12 leaders should explore ways to expand DE offerings for CTE students. About a fifth of Texas high school students have a CTE focus but do not take any DE or AP/IB courses, and these students are more likely to be low-income, male, and Black. CTE-focus-only students generally have strong earnings gains compared to their high school peers in the first three years post high school, but this trend breaks course by the sixth year, as CTE-focus-only students report lower earnings than students with other accelerated coursework profiles. Recent fieldwork on highly effective DE programs suggests that building DE courses into high school CTE programs and career academies represents an effective and replicable strategy for expanding CTE DE on a substantial scale. In such an approach, DE coursework is embedded into high school CTE programs such that students are automatically enrolled into DE courses aligned with their CTE program of study and provided advising and guidance on relevant postsecondary degrees and careers (Fink et al., 2023).

4. **Expanding access to dual enrollment is not enough.** Especially for low-income students, taking DE coursework is not enough to achieve college-going and completion rates comparable to those of higher income students. This is consistent with findings from other research showing that, in order to be effective in serving low-income students and students of color, DE partnerships must invest in extensive and intentional supports to help DE students acclimate to college coursework and explore and plan for postsecondary pathways with college advisors (Fink et al., 2023; Mehl et al., 2020). This type of intentional approach to DE is evident in the ECHS model, which we find to be associated with greater postsecondary attainment and a significant earnings advantage compared with Texas public high school students overall, even in a relatively short timeframe after high school. However, while ECHS programs have expanded substantially in Texas and other states, they are still limited in scale relative to DE coursetaking outside of ECHS programs. State and college leaders should explore how the core practices of ECHSs (e.g., focus on underserved communities, DE-for-all approach, inserting of DE into course sequences, supplemental instructional supports) can be implemented to expand college-and-career-acceleration opportunities for more high school students. To facilitate long-term postsecondary success among underserved students, K-12 and postsecondary partners must take a more purposeful approach to DE, including building a shared vision and making strategic investments to expand high-quality DE offerings aligned to college and career pathways after high school (Fink et al., 2023).

# Endnotes

1. Authors' calculations based on the Civil Rights Data Collection data from the 2021-22 academic year. Calculations include all public schools offering 11th or 12th grade.

2. TWC data excludes certain categories of employment, such as independent contractors, small employers with less than $1,500 in quarterly payroll, domestic employers paying less than $1,000 per quarter, certain nonprofit organizations, and other exempt employment types defined by law (e.g., family employment or student workers).

3. Data on dual enrollment credits is available since the 2015 cohort, and we include the 2016 cohort to gain statistical power throughout our analyses.

4. We estimate that 83% of the students expected to complete high school in 2015-16 and 2016-17 did so, based on whether students had a graduation date or earned an associate or bachelor's degree within six years from their expected high school completion. Among students with no accelerated coursework, this share is 62%. See Appendix Table A1 for more details.

5. FRPL indicates a student's eligibility for the National School Lunch Program, which provides free or reduced-price meals to students from low-income families. Eligibility is determined based on family income relative to federal poverty guidelines.

6. The Title I school program provides supplemental funding to state and local educational agencies to acquire additional education resources at schools serving high concentrations of students from low-income homes. These resources "are used to improve the quality of education programs and ensure students from low-income families have opportunities to meet challenging state assessments" (TEA, n.d.-f).

7. TEA has several different classifications for city (small, medium, large), suburban, town, and rural (both rural and fringe), which we combined in these four categories.

8. In high school, one semester of a course counts as 0.5 credits, whereas a full year in that course counts as 1 credit.

9. Forty percent of students in the 2015 and 2016 cohorts attempted at least one AP/IB course (see Appendix Table A2). Note that we do not draw a distinction between students who passed or did not pass the AP exam.

10. In the 2015 and 2016 cohorts, 3.7% of students were DE and AP/IB takers who attempted 10 or more CTE courses (i.e., had a CTE focus); 7.6% of students were AP/IB takers without DE but who had a CTE focus. Since these groups represent such small shares of the student population, we prioritize their AP/IB participation for this analysis, grouping them in the DE and AP/IB takers and AP/IB takers without DE categories, respectively. These percentages were 5.7% and 10.6% for the 2019 cohort, and 6.4% and 11.7% for the 2022 cohort, respectively.

11. Prior research has found that the magnitude of the bias due to unreported earnings is relatively small in Texas data compared with data from other states (Andrews et al., 2016; Foote & Stange, 2022).

12. This gap far surpasses the estimated earnings attrition bias of 8 percentage points for students with no accelerated coursework.

13. Figure 7 shows earnings data from the 2015 and 2016 high school completion cohorts. Data for students overall in the 2019 cohort are shown in Appendix Figure A7.

14. Due to the small sample of ECHS students, we do not include differences conditional on student and school characteristics or conditional on highest credential attained, which would require further disaggregating into even smaller subgroups.

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