

Assessing College-Credit-in-High-School Programs as On-Ramps to Postsecondary Career Pathways for Underrepresented Students

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Each year, millions of high school students take courses and exams to earn college credit and thus get a jump start on college while also satisfying requirements for high school graduation. Although the strength of the evidence varies by program type, evaluation research indicates that earning college credit through common early college credit programs increases students' chances of going to college directly after high school and of earning a college credential. Research also makes clear, however, that access to early postsecondary opportunities is uneven, with lower rates of participation among students of color, those from low-income families, and those from other groups underrepresented among college graduates (e.g., English learners and students with disabilities). Moreover, research indicates that to be effective with students who do not have clear plans for college after high school, solely enabling students to take college courses is not sufficient; students from underrepresented groups also benefit from outreach, advising, and strong teaching and academic support building on their interests to further motivate and guide them to pursue postsecondary education after high school.

This brief examines research on the five most common college-credit-in-high-school models and assesses their potential as large-scale on-ramps to postsecondary programs that lead to career-path employment for students who have not been well served historically in the transition from high school to college and careers.

Earning college credit in high school can increase the likelihood of attaining a college credential, yet access to early postsecondary opportunities is uneven, with lower rates of participation among underrepresented students.

Assessing Five Program Models

The program models we examine are: (1) Advanced Placement, (2) International Baccalaureate, (3) dual enrollment, (4) Early College High Schools and P-TECHs, and (5) high school career and technical education (CTE) with articulated credit. To assess the potential of these models as equitable on-ramps to postsecondary career pathways on a substantial scale, we consider evidence on gaps in access, benefits for participants, and the overall scale of each type of offering. We review relevant literature and note the strength of research evidence associated with each program type. We consider positive findings from a randomized controlled trial or from multiple studies with a quasi-experimental design as strong evidence of success. We consider positive findings from a single

quasi-experimental study as moderate evidence of success. We consider results from descriptive or correlational studies (which do not attempt to control for differences in characteristics between comparison groups) to constitute weaker evidence. The following table summarizes features and evidence of each model in terms of its potential to serve as a useful on-ramp to a postsecondary pathway for underserved students.

Table 1.
College-Credit-in-High-School Programs: Advantages and Disadvantages as Equitable On-Ramps to Postsecondary Career Pathways

| MODEL | ADVANTAGES | DISADVANTAGES |
|--|---|--|
| 1. Advanced Placement | <ul style="list-style-type: none"> Moderate evidence of college success among exam passers Larger in scale | <ul style="list-style-type: none"> Inequitable access Inequitable exam pass rate College credit not guaranteed Course-focused, not program-focused |
| 2. International Baccalaureate | <ul style="list-style-type: none"> Descriptive evidence of college access and success among IB participants in the U.S. | <ul style="list-style-type: none"> Inequitable access Smaller in scale |
| 3. Dual Enrollment | <ul style="list-style-type: none"> Moderate evidence of college success among participants Larger in scale | <ul style="list-style-type: none"> Inequitable access Limited course planning and student advising Underutilized potential to benefit underserved students |
| 4. ECHSs and P-TECHs | <ul style="list-style-type: none"> Strong evidence of college success among participants (including underrepresented students) Emphasis on career-focused pathways at P-TECHs | <ul style="list-style-type: none"> Smaller in scale |
| 5. High School CTE With Articulated Credit | <ul style="list-style-type: none"> Moderate evidence of college-going and credential completion among CTE concentrators Strong evidence of labor market benefits among career academy participants Larger in scale | <ul style="list-style-type: none"> Inadequate articulation with postsecondary CTE |

1. Advanced Placement

In Advanced Placement (AP), students take courses in a variety of subjects, each of which uses a standardized, college-level curriculum developed by the College Board. Students may earn college credit in a given subject by earning a high enough score on a standardized AP exam offered by the College Board. The College Board recommends a score of 3 or higher on a scale of 1–5 as qualifying for college credit, but colleges and universities decide whether to award credit to students based on their scores; many offer credit for a score of only 4 or higher or (rarely) only 5. Students do not need to be enrolled in an AP course to take the exam.

Advantages as an on-ramp to a postsecondary pathway

Moderate evidence of college success among exam passers. According to research conducted by researchers from the College Board and Harvard (Smith et al., 2017), students who received a qualifying AP exam score of 3, 4, or 5 were 1 to 2 percentage points more likely per exam to earn a bachelor’s degree in four years than similar students receiving a lower score. The higher a student scored on the 1–5 scale, the higher their probability of bachelor’s degree completion.

Larger in scale. In 2021, more than 2.5 million students took 4.6 million AP exams across 38 subjects (College Board, n.d.-b). Over the past 10 years, the number of public high school graduates who took at least one AP exam increased by 6 percentage points (from 29% to 35%). This increase occurred even amid the learning disruptions experienced during the ongoing pandemic.

Disadvantages as an on-ramp to a postsecondary pathway

Inequitable access. Research conducted by the Center for American Progress (Chatterji et al., 2021) using U.S. Department of Education 2015-16 Civil Rights Data Collection (CRDC) data indicates inequitable access to AP across racial/ethnic subgroups. For example, 19% of White students enrolled in one or more AP courses, and 75% of those students took an AP exam. In contrast, only 11% of Black students enrolled in one or more AP courses, and only 69% of those students took an exam.

Inequitable exam pass rate. The study by Chatterji et al. (2021) shows substantial gaps between racial/ethnic subgroups in AP exam “pass” rates. For example, whereas 65% of White students who took an AP exam received a score of 3 or higher, the rate was only 28% among Black students.

College credit not guaranteed. Based on research conducted by the Progressive Policy Institute (Weinstein, 2016), colleges and universities restrict AP credits they accept in four main ways: (1) not accepting any AP credit, (2) restricting AP subjects eligible for course credit, (3) establishing a high minimum AP score required for course credit, and (4) establishing a cap for the number of AP credits accepted per student. According to the findings, 86% of the nation’s top 153 colleges and universities restrict AP credits in one or more of the four ways described. As the number of high school students taking AP continues to grow, these restrictions prevent students from receiving credit toward their degrees.

Course-focused, not program-focused. Currently, there are 38 AP courses/exams sponsored by the College Board, categorized in the following areas: (1) AP capstone diploma program, (2) arts, (3) English, (4) history and social sciences, (5) math and computer science, (6) sciences, and (7) AP world languages and cultures (College Board, n.d.-a). AP courses and exams are designed based on rigorous academic standards for discrete core college subjects. While AP courses are offered in core academic subjects, they are not typically mapped to college programs of study in particular fields, and students may not be advised on how AP courses relate to a major or a career pathway (College Board & Advance CTE, 2018).

2. International Baccalaureate

International Baccalaureate (IB) is an international standardized curriculum developed by the International Baccalaureate Organization (IBO). School districts in the U.S. may offer students the opportunity to take individual IB courses or enroll in an IB Diploma programme (DB). IB offers a cumulative exam only to students enrolled in the respective course. The IB exam is scored on a 1–7 scale, with 4 indicating a passing grade by the IBO. Colleges and universities may award credit for what they consider satisfactory completion, with most institutions providing credit for a score of 5 or higher.

Advantages as an on-ramp to a postsecondary pathway

Descriptive evidence of college access and success among IB participants.

A correlational study involving survey and interview data from selective college admissions teams in the U.S. found that IBDP completers had a higher perceived likelihood of success than non-IBDP participants by admission counselors at their institutions (Culross & Tarver, 2011). IBDP completers were also more actively recruited by top colleges' admissions teams than their high school classmates not enrolled in the IBDP. A correlational study sponsored by IB (Pilchen et al., 2020) found that students who took IB courses were nearly 35 percentage points more likely to enroll in a four-year institution immediately after high school than the average U.S. high school graduate.

Disadvantages as an on-ramp to a postsecondary pathway

Inequitable access. IB programming continues to expand in public and private U.S. high schools, with a 156% increase in participating schools from 2000 to 2017 (360 to 923). However, Perna et al. (2015) show that student participation is heavily dependent on encouragement from advisors. According to the same research, the tracking of students into different curricular paths, in both middle and high school, plays a large role in the likelihood of a student participating in IBDP.

Smaller in scale. In 2017, about 174,000 students enrolled in IB courses across 923 schools (authors' analysis using 2017-18 CRDC data). Annually, nearly six times as many students enroll in AP and dual enrollment courses than in IB courses. AP courses are offered in 24 times the number of schools as IB courses (College Board, 2018).

3. Dual Enrollment

Dual enrollment programs, in which high school students take college courses through a partner postsecondary institution, are quite varied in their design and implementation. High school students may take the courses at the high school, at the partnering college campus, or online, and the courses may be taught by qualified high school instructors or college faculty. College credit is typically awarded upon completion of the course, and credits may usually be transferred to other colleges or universities after the student completes high school.

Advantages as an on-ramp to a postsecondary pathway

Moderate evidence of college success among participants. A literature review of empirical research on dual enrollment participation and outcomes by An and Taylor (2019) suggests that dual enrollment participants have better outcomes than nonparticipants and that these better outcomes occur across all race, class, and gender subgroups. Students participating in dual enrollment English or language arts courses are more likely to enroll in college (Struhl & Vargas, 2012) and attain a bachelor's degree (Villarreal, 2017) compared with similar nonparticipants. A study in Texas found that students who struggled academically in ninth and tenth grade but took only one or two dual credit courses were substantially more likely to attend and complete college

than similarly matched peers (Lee & Villarreal, 2022). A quasi-experimental study in Nebraska found that dual enrollment was positively associated with graduating from high school and enrolling and persisting in college. These positive associations were greatest among underrepresented minority students, first-generation students, and low-income students (Lee et al., 2022).

Larger in scale. More than 1.5 million students annually participate in dual enrollment (Fink, 2021). Four out of five public schools in the U.S. offer dual enrollment courses, and public schools in rural areas have the largest participation rate at 90% (National Center for Education Statistics [NCES], 2020). A third of all students graduate high school having taken some type of dual enrollment course (NCES, 2019).

Disadvantages as an on-ramp to a postsecondary pathway

Inequitable access. Participation data consistently indicate that White students are more likely than their Black and Hispanic peers to take dual enrollment courses. For example, analysis we conducted using CDRC data from the 2015-16 and 2017-18 school years shows that White students participated in dual enrollment at a rate nearly twice that of Black and Hispanic students. Other research has shown that male students, students with disabilities, foster youth, students from low-income families, English language learners, first-generation students, and students experiencing homelessness are underrepresented in dual enrollment (Fink, 2022).

Limited course planning and student advising. Practitioners and college leaders sometimes use the term “random acts of dual enrollment” to describe haphazard course planning and a lack of student advising that is common among dual enrollment programs (Fink et al., 2022). Dual enrollment course offerings are often constrained by instructor availability and other logistical factors; it can thus be challenging to offer coherent sets of courses that create on-ramps to programs of study, let alone provide adequate advising and supports to facilitate student exploration and early momentum in college programs. As a result, students may accumulate substantial numbers of college credits through dual enrollment that may not transfer and apply toward degree programs after high school (Fink et al., 2018). In a study of partnerships of high schools and colleges effective in achieving equity in access to dual enrollment and strong post-high school college-going for students of color, CCRC and the Aspen Institute’s College Excellence Program found that high-performing partnerships tended to make an effort to advise students and ensure that they took courses that applied toward a degree in their field of interest (Mehl et al., 2022).

Underutilized potential to benefit underserved students. Although research suggests that dual enrollment produces positive outcomes for students of color, (Liu et al., 2020; Pretlow & Patteson, 2015), low-income students (Blankenberger et al., 2017), and academically struggling students (Lee & Villarreal, 2022), gaps in access to dual enrollment coursework has meant that the benefits to underserved groups have not been fully realized. Additional research and support for broadening the benefits of dual enrollment to more students currently underserved in the high-school-to-college transition are strongly needed.

4. ECHSs and P-TECHs

Early College High Schools (ECHSs) and Pathways in Technology Early College High Schools (P-TECHs) are distinct types of dual enrollment programs in which school districts and local colleges and/or universities partner to offer students an opportunity to pursue an associate degree or complete up to two years' worth of transferable college credits. P-TECHs typically have a career field focus. Some ECHSs also have an academic or career field focus, though many are designed to enable students to earn an associate of arts degree in liberal studies. The programs tend to be designed for students from groups underrepresented in higher education. ECHSs and P-TECHs are offered at low or no cost to students. Additional wraparound supports are provided to students to help them persist toward graduation and gain access and success in college.

Advantages as an on-ramp to a postsecondary pathway

Strong evidence of college success among participants (including underrepresented students). A randomized controlled trial conducted by the American Institutes for Research (AIR) (Song & Kessler, 2019) found that ECHS students were, on average, 7 percentage points more likely to enroll in college within six years of their high school graduation compared to non-ECHS students. This study also found that ECHS students were nearly 12 percentage points more likely to complete a postsecondary degree or credential each year between the fourth year of high school and six years after high school graduation. A recent interim research brief by MDRC (Dixon & Rosen, 2022) from a randomized controlled trial conducted on New York City's P-TECH (grades 9–14) program showed positive effects of participation on student outcomes, including college credits attempted and earned. The findings suggest that the program is especially successful in helping students at risk for underperforming participate in dual enrollment and achieve key academic milestones.

Emphasis on career-focused pathways at P-TECHs. P-TECHs integrate high school academic programming, college coursework, and work-based learning opportunities for students. A study conducted by MDRC (Rosen et al., 2020) found that New York City's P-TECH program successfully paired high school CTE coursework with college credit-bearing courses, allowing students to earn career-specific credentials together with college credit. CTE courses offered to P-TECH students focus on technical skills and training; academic courses include a focus on “soft skills,” which helps students expand interpersonal and problem-solving skills within their career training.

Disadvantages as an on-ramp to a postsecondary pathway

Smaller in scale. The first ECHSs were piloted over 20 years ago. Today more than 280 public ECHSs in the U.S. serve about 80,000 students annually (Song & Zeisler, 2019). While the early college model is also embedded into other high schools not formally designated as ECHSs, the intensive requirements—both on students and instructors—limit the scale of early college programs. Although the beneficial impacts for ECHS students are significant, there has been a lack of investment by the federal government and most states to scale early college programs in a way that reaches a large population of students (AIR, 2020).

5. High School CTE With Articulated Credit

High school career and technical education (CTE) programs focus on education and training that helps students explore career interests and develop technical skills in a particular field, and some high school CTE programs provide “articulated credit” that can be applied toward a postsecondary credential. Under the most recent Carl Perkins legislation, which provides federal funding for CTE, states are required to (1) implement standards for high school CTE programs that ensure that students are both career and college ready and (2) facilitate collaboration between high schools and postsecondary institutions to ensure that students can pursue further education after high school. In recent years, policymakers at both the federal and state levels have sought to encourage CTE program designs that include work-based learning and aligned academic coursework that help students prepare both for college and careers (Advance CTE, n.d.). One popular model for accomplishing this is the high school career academy, which is designed to create small, focused learning communities (academies) for high school students with integrated classroom and work-based learning focused on particular career fields.

Advantages as an on-ramp to a postsecondary pathway

Moderate evidence of college-going and credential completion among

CTE concentrators. A quasi-experimental study found that CTE concentrators (students who complete a sequence of CTE courses aligned to a specific career field) were 7 percentage points more likely than non-CTE concentrators to graduate from high school on time and 10 percentage points more likely to enroll in postsecondary education within two years of their expected high school graduation year. The study also found that CTE concentrators were 3 percentage points more likely than non-CTE concentrators to earn a postsecondary award, such as a professional certificate, diploma, or associate or bachelor’s degree, within five years of their expected high school graduation year (Brodersen et al., 2021).

Strong evidence of labor market benefits among career academy

participants. A 15-year randomized controlled trial by MDRC (Kemple, 2008) found that participating in a high school career academy produced sustained earnings gains that averaged 11 percent (or \$2,088 in 2006 dollars), with the strongest benefits going to men. At the same time, career academy participants were no more likely than nonparticipants to go to postsecondary education.

Larger in scale. Three out of four U.S. public high school students take at least one CTE course, and 35% complete at least two courses in a single career field (U.S. Department of Education, 2019). The courses serve as opportunities to explore career options while in high school, informing decisions about career trajectory and college major. Career academies, first established in 1969, now operate in more than 7,000 schools nationwide, enrolling about a million students (National Career Academy Coalition, n.d.). Students typically enter them as first-year or sophomore students in high school.

Disadvantages as an on-ramp to a postsecondary pathway

Inadequate articulation with postsecondary CTE. Graduates of high school CTE programs often earn articulated credit that colleges have agreed to accept for credit toward a postsecondary degree program in the same field. However, it is generally left to students to ensure that colleges actually apply these credits to such programs. A large-scale study of high school CTE found evidence of a need for local education agencies to develop regional CTE networks to improve articulation across secondary and postsecondary programs (Hughes et al., 2021). Nearly three fourths of public high school districts offer CTE courses that allow students to earn high school and college credit; however, only one third of districts align CTE pathways with postsecondary programs. High school CTE programs offering courses that offer dual credit are commonly underutilized as an opportunity for students to earn college credit (Giani, 2022). In a national study of Tech-Prep, an earlier model of high school CTE that is still reflected in many programs today, only 15% of participants who took CTE courses that could be articulated for college credit actually received college credit (Hershey et al., 1998). High schools and colleges looking to improve the utilization of articulated credit should take steps to ensure the alignment of career academies and other CTE programs with college CTE programs.

Conclusion

A variety of programmatic approaches have proliferated with the goal of enabling students to earn college credit while in high school. In this brief, we described the five most common college-credit-in-high-school program models, and we discussed their advantages and disadvantages in providing broadly accessible on-ramps into college program pathways after high school. Such on-ramps may be key in enabling underrepresented students to earn degrees and secure entry-level employment in a field aligned with their interests. Information included in this brief should not be interpreted as a recommendation for schools, students, and colleges to give preference to one model over another. Rather, we present a research-based synopsis of the benefits and limitations of each model to provide guidance to practitioners and policymakers aiming to provide stronger and more equitable on-ramps to postsecondary career pathways.

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