STATE REPORT | NOVEMBER 2024

EXAMINING STUDENT TRANSITIONS INTO COLLEGE AND CAREER PATHWAYS IN WASHINGTON

Strategic Data Project Education to Workforce Pathways Diagnostic Research Report

INTRODUCTION

In 2013, the Washington Student Achievement Council set an ambitious goal for 70 percent of the state's 25– to 44–year-olds to possess a credential beyond high school. This goal was motivated by the need to align state education attainment rates with the evolving requirements of the state economy and its changing demographic composition.[i] One study estimated that between 2024 and 2029, nearly 70 percent of jobs in Washington will require some form of a postsecondary education.[ii] However, as of 2021, only 53% percent of the state's 25– to 44–year-olds had earned at least an associate degree.[iii]

Given the projected increase in demand for college-educated workers in Washington, the state needs to address the gap between the current amount of qualified young adults and the anticipated workforce needs. Many system conditions and individual factors play a role in determining why and whether a student earns a postsecondary credential. For instance, students considering postsecondary education will weigh the costs and benefits of continuing their education. In these deliberations, expected earnings will play a large role in students' decision to attend college. Potential students will also weigh earnings in deciding which degree to pursue and what credentials to complete (41). Ascertaining the payoff to a college degree is especially important at a time of declining college enrollment, and of increased doubts about the value of a college degree.

In addition to having an interest in continuing their education, students also need to have access to postsecondary institutions and to successfully navigate their way through their programs to degree completion. Identifying and removing barriers to access and completion requires institution leaders and policy makers

ACKNOWLEDGEMENT

This report was prepared with support from the Bill and Melinda Gates Foundation. The report and analyses were prepared and supported by Atticus Bolyard, Sue Dynarski, Jon Fullerton, Miriam Greenberg, Julia Lubner, Aleksei Opacic, Eric Taylor, and Rachel Worsham (listed alphabetically). The authors would also like to thank Elise Swanson, Lisa Sanbonmatsu, Mimi Tan, Rachel Tropp. Julia Bloom-Welton, Katie Weaver-Randall, Dani Fumia, and Bonnie Nelson for their feedback and guidance throughout the development of the report.

ABOUT THE STRATEGIC DATA PROJECT

SDP partners with state and local K–12 education agencies to build capacity for managing, analyzing, and communicating with data. SDP cultivates analytic talent through a two-year fellowship program, in-person and online trainings, and widely accessible tools and resources. The Harvard Center for Education Policy Research launched SDP in 2008 to meet a need for analytical capacity in state and local K–12 agencies. Reform-minded school superintendents were experimenting with new programs and policies, but lacked the capacity to evaluate those efforts or to make data-informed decisions.

Since 2008, SDP has collaborated with nearly 300 school districts, charter management organizations, state education agencies, and nonprofits to sponsor close to 600 SDP Fellows. Fellows may already work at a partner agency, or SDP recruits and selects Fellows who are then placed at partner organizations. SDP alumni work at K–12 agencies and organizations around the country, and most alumni continue to take advantage of the SDP professional network, trainings, and analytical resources.

to understand students' movements through educational pathways, where many fall off, and who ultimately completes a postsecondary degree.

To help the state of Washington understand its current progress toward the state education goal, set future benchmarks for success, and strategically identify barriers to remove, the Strategic Data Project designed a set of diagnostic analyses that track students from high school to their entrance into the workforce. These analyses are meant to:

1. Better inform state education leaders about the college-going, college-completion, and workforce pathways of their students—and barriers to completion of those pathways; and

2. Identify potential areas of action to better support students' postsecondary attainment and financial stability.

We leverage state longitudinal data from the Washington Education Research and Data Center to follow Washington's high school graduating classes of 2013 and 2014 for the first seven years after graduation. By focusing analyses on these graduating classes, we can observe students' progression to and through postsecondary education and into the workforce. The outcomes and disaggregates we explore in this diagnostic are informed by the Education-to-Workforce (EW) Indicator Framework[iv]—a comprehensive guide that includes a common set of metrics and data equity principles for assessing and addressing disparities along the pre-K-to-workforce continuum.[v]

We begin by examining patterns in credential attainment for Washington's public-school students seven years after high school graduation. We disaggregate these analyses by student demographic, academic, and school characteristics to identify groups of students who may need additional support progressing toward credential completion. While a foundational understanding of degree attainment patterns is useful, action can only be taken if we understand what drives these patterns. We therefore explore potential root causes for attainment patterns by exploring whether college entry rates, completion rates amongst enrollees, or a combination of both explain variation in degree attainment. These analyses will help both K12 and postsecondary institutions identify patterns and potential gaps in access and completion for early intervention. Finally, we examine workforce outcomes in the form of wages for Washington's high school graduates. We provide context to these analyses by benchmarking wages against the MIT living wage[vi] threshold to better understand who is earning enough to meet a minimum standard of living and which degrees are associated with the largest earnings premiums.

In summary, this work leverages the Washington Education Research and Data Center's longitudinal data to provide both strategic insights and support decision-making by system leadership to increase postsecondary attainment. Analysis and review of this Diagnostic will allow for the continual monitoring and improvement of structures and supports that will help students progress toward their goals.

KEY FINDINGS

Patterns in Educational Attainment and Potential Drivers

1. Degree attainment rates of Washington high school graduates in 2013 and 2014 graduating classes fall short of the state educational goal of 70% of workers with a college credential.

- Although 76% of WA high school graduates attempt college within seven years of high school graduation, only about 45% have credentials by the end of year seven, far short of the state's goal of 70%.

2. Both college access and completion contribute to low attainment rates.

- Around 30% of WA high school graduates began but did not complete college. 24% never attempted college.
- Only a small fraction of students who stopped out return to college, suggesting that preventing initial stop out is a crucial strategy to increase degree attainment.

3. Students doing well academically in high school finish college at much higher rates, indicating the importance of a strong secondary school foundation.

- Students with the highest scores on standardized tests in high school were 50 percentage points more likely to complete college than those with the lowest scores.
- Students who took advanced math coursework in high school were between 20 and 40 percentage points more likely to complete college than those who did not engage in this coursework.

4. College enrollment decisions and academic performance in the first term also matter for credential attainment.

- Students who first enrolled at public 2-year and career and technical colleges (CTCs) were about 25 percentage points more likely to stop out than those who enrolled in other institution types.
- Many stop outs leave college early in their degree programs.
- Focusing on improving academic outcomes in the first semester of college may help prevent stop out.

5. The drivers of educational attainment vary by student demographics.

- While Black students have favorable college-going rates compared to students from other racial/ethnic groups when accounting for high school achievement, they were among the most likely group to stop out. These stop out rates place Black students among the least

likely to earn a college credential by seven years from high school graduation. Hispanic and American Indian/Pacific Islander (AI/PI) students may also face barriers to entry and completion that drive their lower attainment rates.

- English Language Learner (ELL) students, those who received special education (SPED) services, those with SPED and ELL services, those who were eligible for Free and Reduced-Price Lunch (FRPL), and students who experienced homelessness had lower credential completion rates than their peers. Credential completion among these groups is driven by both lower college entry and higher stop out rates.

6. Attainment rates lag for students from rural and town locales.

- Students from rural and town locales were around 10 percentage points less likely to complete postsecondary degrees than their suburban and urban peers.
- Attainment rates are largely driven by lower postsecondary enrollment rates for rural and town students.

Workforce Outcomes

7. College graduates earn more at work.

- Students with bachelor's degrees experienced the largest earnings premiums.
- Nearly 50% of workers with only a high school degree did not earn over the living wage threshold in Washington as compared to only 15% of those with bachelor's degrees.

8. Credentials alone do not determine wages. The wage premium associated with earning a college credential varies by student characteristics.

- Wages differ even among individuals who completed the same credential. Those who scored better on the High School Proficiency Exam earned more.
- A college degree does not erase racial differences in earnings. Racial earnings gaps are persistent across credential types and prior achievement.
- Earning gaps were present across other dimensions of student demographics including sex and pre-college socioeconomic status.

9. The location and type of college a student attends matters for future earnings.

10. Professional and technical training pays off. Those with professional and technical degrees earn more than those with academic oriented degrees across credential levels.

DETAILED ANALYSES

Patterns in Educational Attainment and Potential Drivers

This section of the Diagnostic explores patterns in student credential attainment and their possible determinants. We present findings from three types of analyses:

1. First, we examine degree completion seven years from high school graduation to establish a foundational understanding of students' postsecondary educational outcomes.
2. We then analyze patterns in college enrollment within one year of high school graduation to unearth some of the drivers of credential completion rates in Washington. This section focuses on enrollment within one year, when secondary schools and districts have the most leverage to impact college-going. Armed with this information, school districts and high schools can identify students who might need guidance navigating the college enrollment process.
3. Finally, we track college completion among Washington's high school graduates with a particular emphasis on enrollment behaviors and composition of college stop outs. Results of these analyses provide further context to the potential drivers of degree attainment rates in Washington. These results will also provide postsecondary institutions with information needed to identify students who might need more support once enrolled and plan re-enrollment campaigns.

In addition to exploring broad patterns in access, completion, and attainment, we completed a series of analyses disaggregating educational attainment for Washington high school graduates in the classes of 2013 and 2014 by student demographic, academic, and school characteristics. Prior research suggests that student background characteristics such as race, socioeconomic status, and academic preparation are predictive of educational attainment (see sources in Table 2). Understanding the extent to which postsecondary credential attainment rates, college entry, and stop out may vary for students with different academic and demographic characteristics can help Washington identify potential strategies for supporting these students as they work toward college credentials.

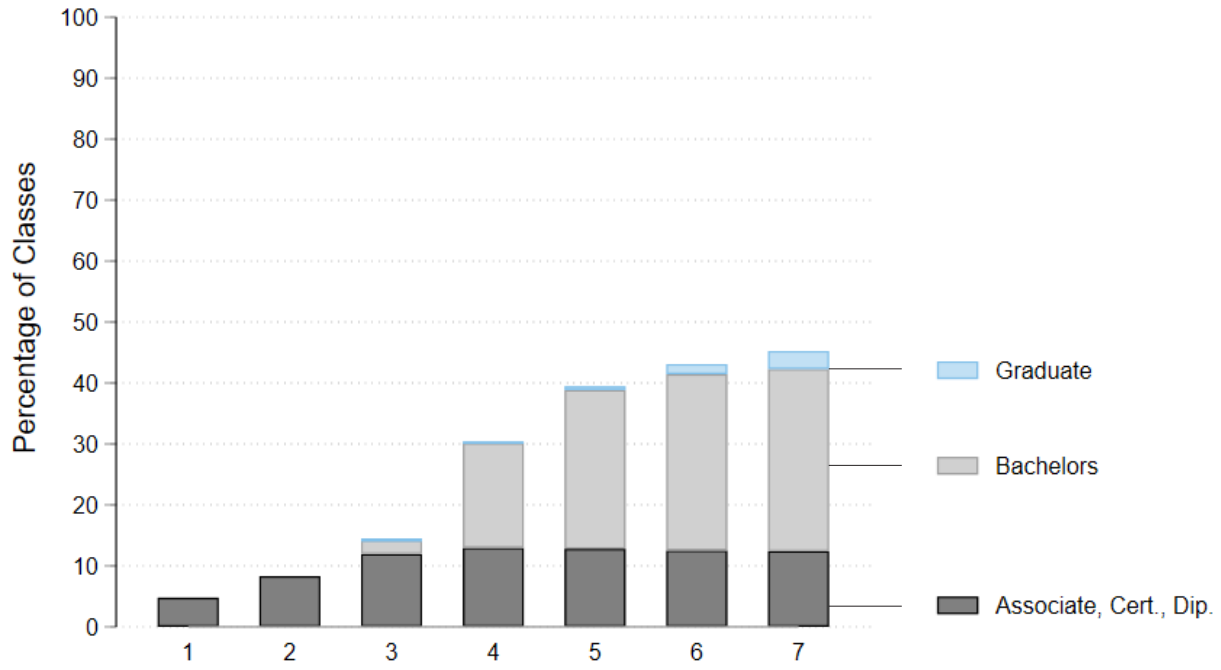
Key Finding 1: Degree attainment rates of Washington high school graduates in the 2013 and 2014 graduating classes fall short of the state educational goal of 70% of workers with a college credential.

Although 76% of WA high school graduates attempt college within seven years of high school graduation, only around 45% have credentials by the end of year seven, far short of the state's goal of 70%.

We begin our analysis of credential attainment patterns by plotting the percentage of students who

earned a credential[1] 1-7 years after high school graduation from the classes of 2013 and 2014. As seen in Figure 1.1, the percentage of students who have received a college credential increased over time—with nearly 45% of graduates having earned a credential seven years from graduation. Interestingly, many students did not earn degrees until five to seven years after high school, which emphasizes the necessity of examining college completion beyond the timeframe traditionally assumed for completion (four years). This analysis also indicates that Washington high school graduates are not earning credentials at the rate needed to meet the state's current education attainment goal of 70%.

Figure 1.1 Percentage of Graduating Classes by Highest Credential



Sample includes the classes of 2013 and 2014.
We do not report the percent with BAs or higher in the first two years from graduation due to small cell sizes.

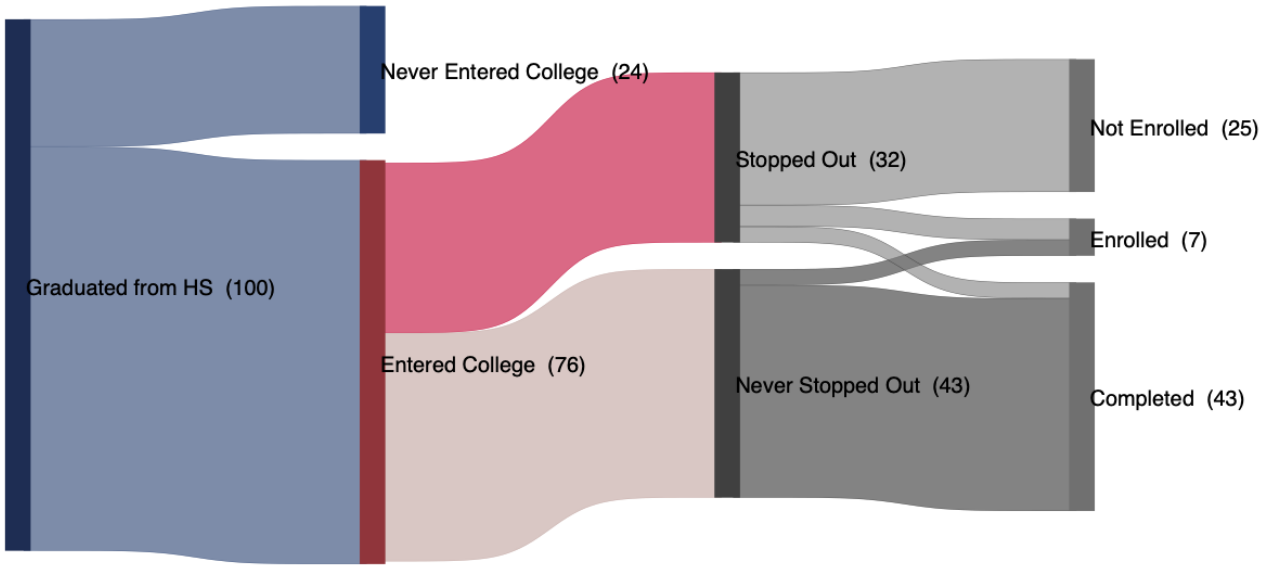
Key Finding 2: Both college access and completion contribute to low attainment rates.

Around 30% of WA HS graduates began but did not complete college. 24% never attempted college.

To account for the activities of the nearly 55% of students who did not receive a college credential, we trace students to and through college over seven years. As seen in Figure 2.1, we find that around 30% of Washington high school graduates began but did not complete college within seven years of high school graduation and 24% never attempted college. These results indicate that both college entry and stop out play a role in driving the attainment rates highlighted above.

1 Credentials include sub-baccaulareate credentials (certificates, diplomas, associate degrees), bachelor's degrees, and graduate degrees.

Figure 2.1 Percentage of Graduating Classes who Completed, are Enrolled, Stopped Out, or Never Attempted College Seven Years after High School Graduation

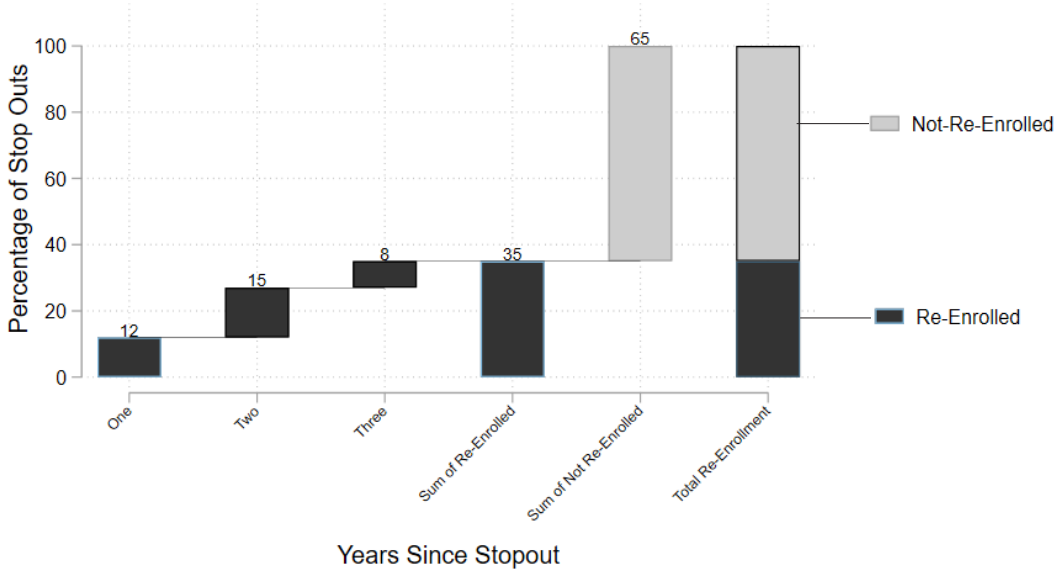


Sample includes the classes of 2013 and 2014 who did not receive a degree in high school measured 7 years after high school graduation. Stopout defined as students who enrolled in at least one semester of college, had not finished a degree, and were not enrolled at year 7.

Only a small fraction of students who stopped out return to college, suggesting that preventing initial stop out is a crucial strategy to increase degree attainment.

Our analyses above indicate that about 40% of degree attempters stop out prior to receiving their degrees. Preventing stop out before it occurs may be a critical strategy to support degree attainment rates in the state, as figure 2.2 shows that only around 35% of stop outs have returned within three years of stop out. Those who do return generally re-enroll within two years of stop out. These findings suggest that the initial stop out, for many students, may mark the end of their postsecondary careers. They also suggest that re-enrollment campaigns should focus on students who recently departed the institution.

Figure 2.2 Percentage of Stop Outs Who Re-Enrolled Within Three Years of Departure



Sample includes the classes of 2013 and 2014 who did not receive a degree in high school measured 7 years after high school graduation. Stopout defined as students who were absent from enrollment for at least one year before earning their first credential.

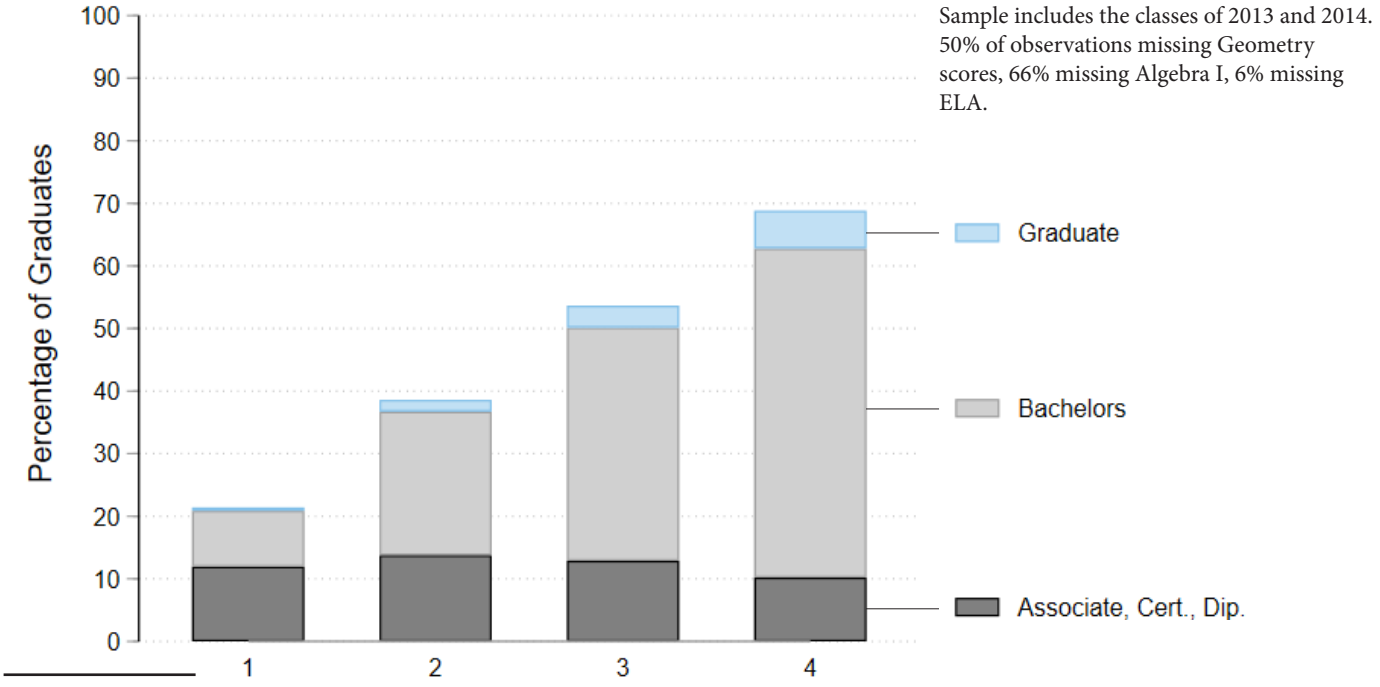
Key Finding 3: Students doing well academically in high school finish college at much higher rates, indicating the importance of a strong secondary school foundation.

Thus far, we have found that college attendance and stop out drive degree attainment rates among Washington's high school graduates. In Finding 3, and the findings that follow, we examine whether this pattern remains true when we examine outcomes for students broken down by their academic and demographic characteristics. We begin by plotting credential attainment by student characteristics. To identify potential drivers of variation in degree attainment rates, we also explore college enrollment and stop out broken out by student characteristics. These analyses will help Washington identify students in need of additional support and target interventions to address key junctures in the road to and through college. See Table 2 for literature connecting disaggregates to students' outcomes.

Students with the highest scores on standardized tests in high school were 50 percentage points more likely to complete college than those with the lowest scores.

First, we focus on the relationship between student academic performance and educational outcomes. We begin by plotting degree attainment by test score quartile on the Reading and Writing High School Proficiency Exam, which is usually administered in 10th grade.[2] Shown Figure 3.1, this analysis demonstrates that 55% and 70% of students who scored in the third and fourth quartiles of the test completed a postsecondary credential, while only 20% and 40% who scored in the first and second quartiles earned a credential. Students in the upper quartiles were also more likely to earn bachelor's and graduate degrees. These patterns were similar for the Geometry end-of-course exam (see Appendix Figure A.1).

Figure 3.1 Degree Attainment Seven Years from High School by Quartile of ELA Achievement

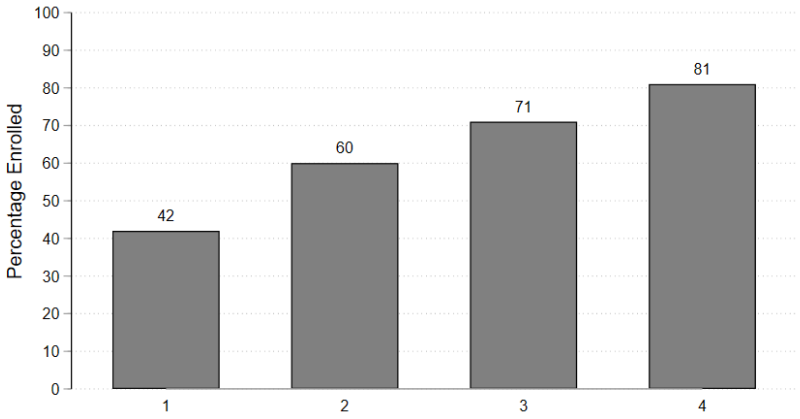


Sample includes the classes of 2013 and 2014. 50% of observations missing Geometry scores, 66% missing Algebra I, 6% missing ELA.

2 Using a standardized test as a measure of academic achievement allows us to make "apples to apples" comparisons regardless of which high school a student attended and when.

When considering college entry by test score, we see a similar pattern. In particular, we find that students who scored in the fourth quartile of the Reading and Writing High School Proficiency Exam were around 40 percentage points more likely to enter college within a year of high school graduation than their peers scoring in the first quartile (Figure 3.2). This advantage also exists in the middle of the distribution, as those who scored in the third quartile were 11 percentage points more likely to attend college than those scoring in the second quartile.

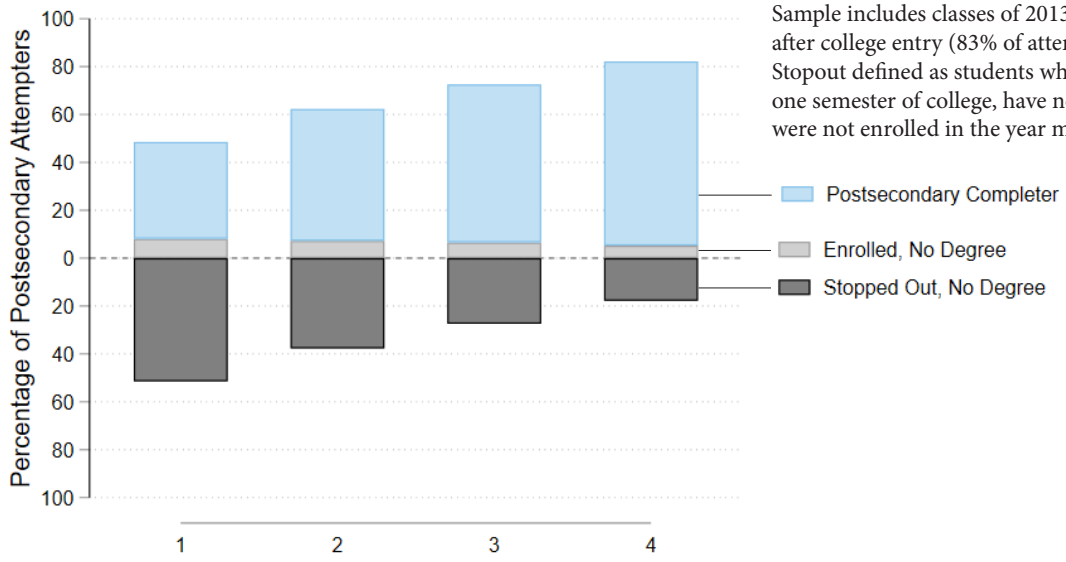
Figure 3.2 Percentage Enrolled in College One Year After High School by Quartile of ELA Achievement



Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).
6% of observations are missing test scores.

Patterns in college stop out mirrored entry patterns: as test score increased, so did the chance a postsecondary attempter would complete (Figure 3.3). Overall, 40 percent of students who scored in the first quartile of the Reading and Writing High School Proficiency Exam did not enter college within seven years of graduation (analyses not shown) and about 50 percent of enrollees stopped out. This stands in stark contrast to the movements of students who scored in the fourth quartile. Among these students, only 10 percent did not attend college and about 20 percent of enrollees stopped out. In the second and third quartiles, 30 and 20 percent did not attend college and about 25 and 40 percent of enrollees stopped out, respectively.

Figure 3.3 Percentage of Postsecondary Attempters by Enrollment Status Six Years After College Entry by Quartile of ELA Achievement

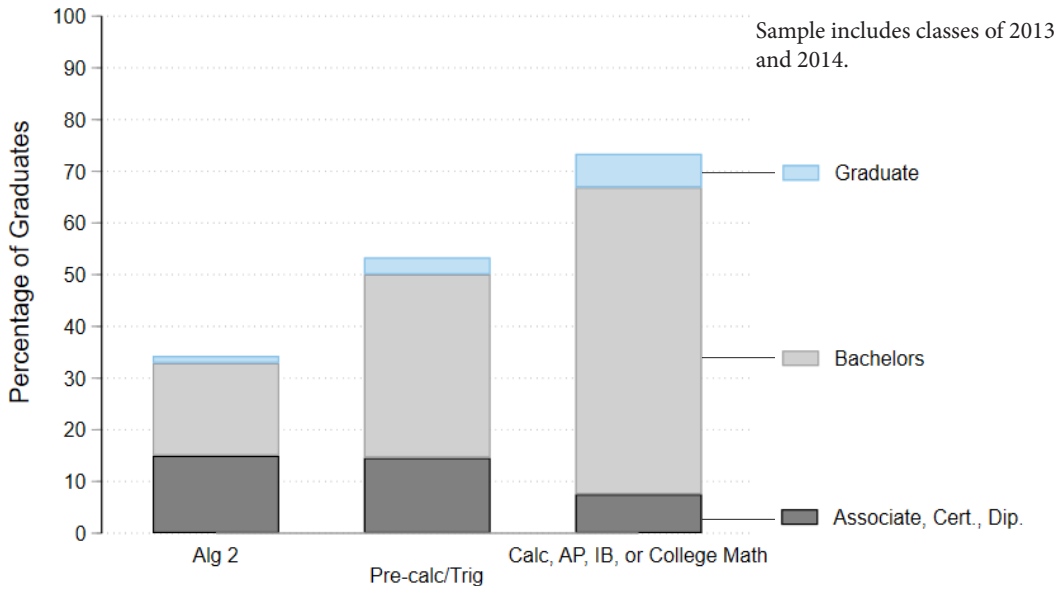


Sample includes classes of 2013 and 2014 measured 6 years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.

Students who took advanced math coursework in high school were between 20 and 40 percentage points more likely to complete college than those who did not engage in this coursework.

We also assess the relationship between participation in advanced math coursework and student outcomes given a growing body of evidence showing that students who participate in advanced coursework are more likely to enroll in and complete postsecondary education (24-26). Aligned with the general idea that advanced coursework is linked to better student outcomes, our analysis in Figure 3.4 shows that over 70% of students who took advanced math coursework (calculus, AP, IB, or college math) completed credentials by seven years from high school. These attainment rates are likely driven by higher college entry and lower stop out rates for participants (see Figure A.2-A.3).

Figure 3.4 Degree Attainment Seven Years from High School by Highest Math in High School



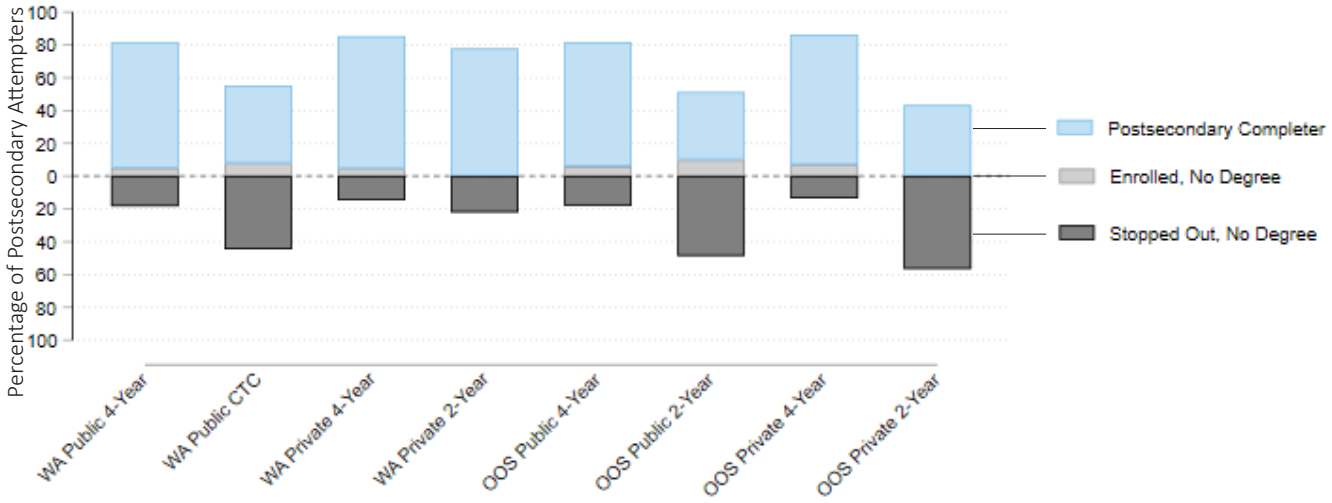
Overall, these findings suggest that lower achieving students may have difficulty accessing and completing postsecondary education. Given that students who perform better in high school are more likely to attain degrees, intensive academic support at the secondary level for students demonstrating lower levels of achievement may help improve enrollment and completion rates. Further, postsecondary institutions should consider targeting academic services to students based on performance in high school.

Key Finding 4: College enrollment decisions and academic performance in the first term also matter for credential attainment.

Students who first enrolled at public 2-year and CTCs were about 25 percentage points more likely to stop out than those who enrolled in other institution types.

Next, we examined whether there were patterns in completion based on where a student first enrolled. In Figure 4.1, we plot the percent of students who have completed, are currently enrolled, or have stopped out six years after college entry by institution type in their first term of enrollment. We find that students who first enrolled at public 2-year institutions were about 25 percentage points more likely to stop out than those who enrolled in other institution types.

Figure 4.1 Percentage of Postsecondary Attempters by Enrollment Status Six Years After College Entry by College Type in First Term



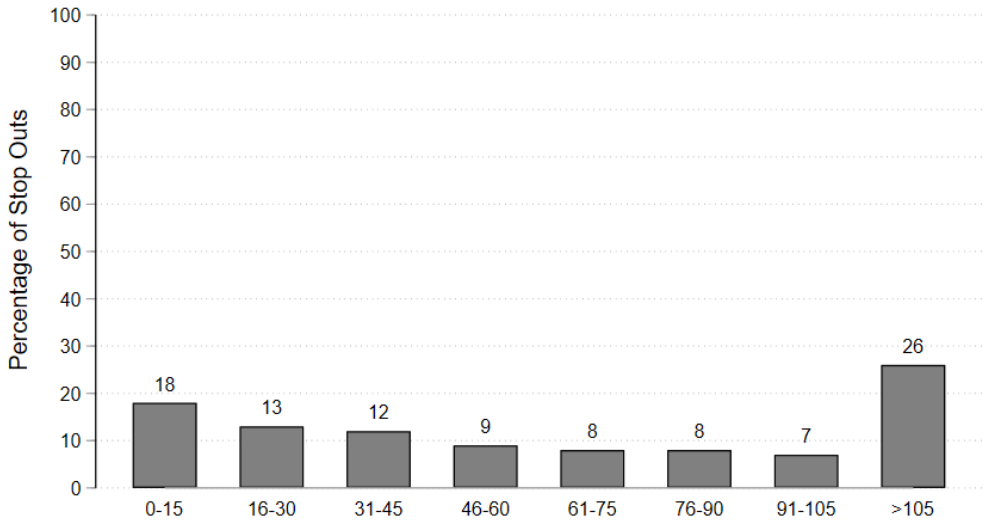
Sample includes classes of 2013 and 2014 measured 6 years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Graph does not include students still enrolled at out-of-state 2-year private institutions due to small cell sizes.

Many stop outs leave early on in their degree programs.

To better understand how far stop outs progress in their degree programs before departure, we plot the percentage of stop outs who attended WA public colleges by the number of credits they earned at first departure.[3] Figure 4.2 indicates that about a third of students who stopped out of WA public four-year colleges left with less than one year of full-time academic work completed (30 credit hours). As seen in Figure 4.3, almost 70% of students who stopped out of WA two-year colleges left with less than one year of full-time academic work completed. These results suggest that most stop outs leave before they have made substantial progress in their degree programs. However, there is a substantial population (26% of stop outs at four-year colleges, 19% at two-year colleges) who are 15 or fewer credits away from reaching degree minimums. Targeting these students for re-enrollment campaigns may help the state move toward its education attainment goal.

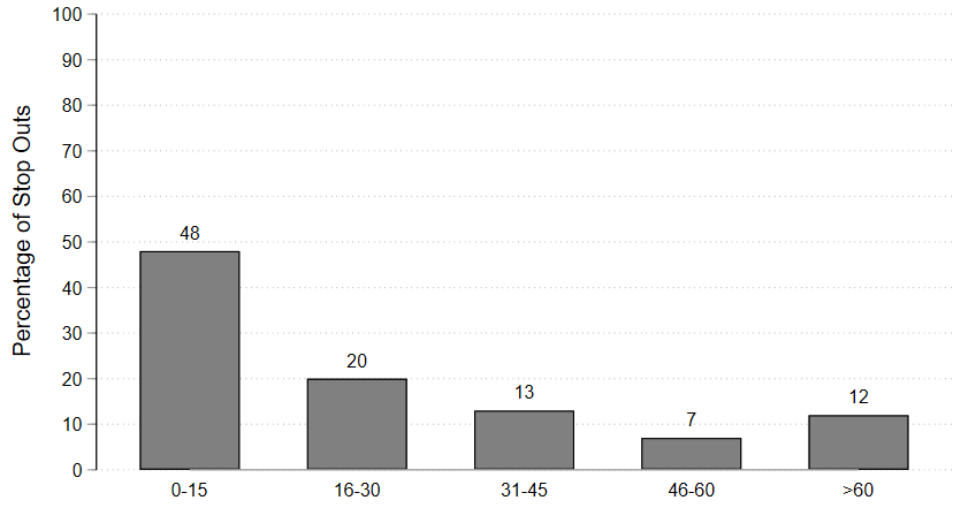
3 For these analyses, we limited the sample to Washington high school graduates from the classes of 2013 and 2014 who entered WA public colleges with at least three years to complete for sub-baccalaureate degree attempters and six years for Bachelor's degree attempters (150% of time to degree).

Figure 4.2 Credits Earned at First Stopout Among Four-Year College Enrollees



Sample includes classes of 2013 and 2014 who enrolled with at least six years to complete.
Sample only includes students enrolled in WA public colleges.
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Institution taken from first term of enrollment.

Figure 4.3 Credits Earned at First Stopout Among Two-Year College Enrollees



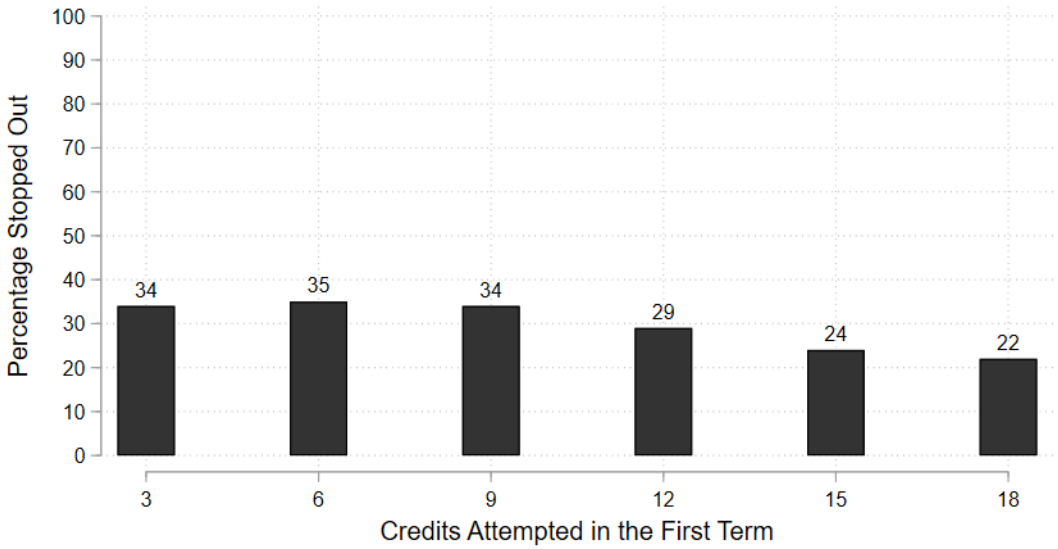
Sample includes classes of 2013 and 2014 who enrolled with at least three years to complete.
Sample only includes students enrolled in WA public colleges.
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Institution taken from first term of enrollment.

Focusing on improving academic outcomes in the first semester of college may help prevent stop out.

To help institutions identify key junctures for stop out prevention interventions, we look at the relationship between students' academic performance, specifically credit accumulation and GPA, and

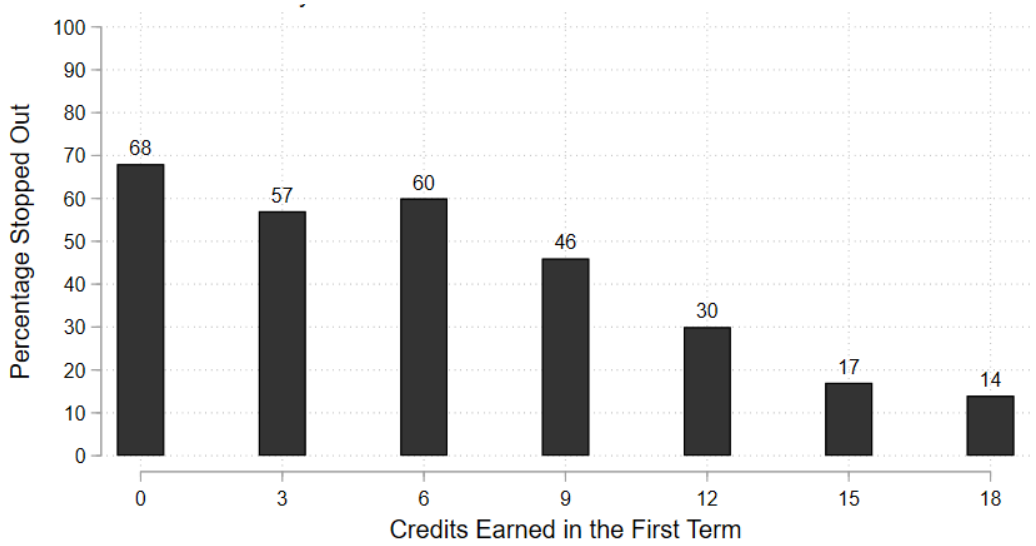
stop out once enrolled for those attending WA public institutions.[4] First, we examine whether credit accumulation in the first term is associated with credential completion, as prior work has found that students who earn credits at a faster rate are more likely to graduate (35-37). In Figures 4.4 and 4.5, we plot the percentage of students enrolled in four-year colleges who stop out within three years of entry by credits attempted and earned in the first term. While it does not appear that the number of credits attempted is associated with stop out, we do see that students who earned fewer credits in their first term were more likely to stop out.

Figure 4.4 Percentage of 4-Year College Enrollees Who Stopped Out by Number of Credits Attempted in the First Term



Credits earned in the first term are grouped into three-credit intervals, labeled by the maximum of the interval.
Sample includes classes of 2013 and 2014 who attended WA public colleges measured within six years after college entry.
Stopout defined as students who have enrolled in at least one semester of college and have not completed a degree.
Institution taken from first term of enrollment.

Figure 4.5 Percentage of 4-Year College Enrollees Who Stopped Out by Percentage of Attempted Credits Earned in the First Term

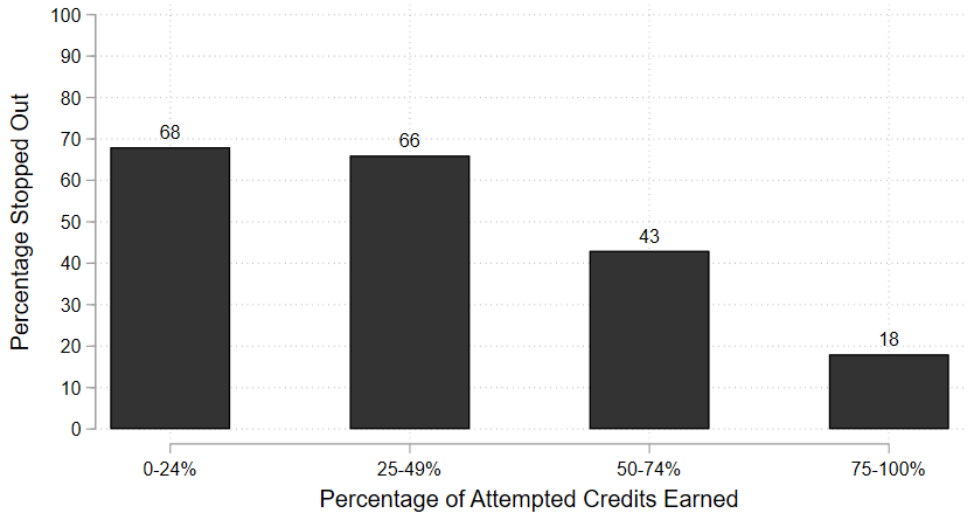


Sample includes classes of 2013 and 2014 who attended WA public colleges measured within six years after college entry.
Stopout defined as students who have enrolled in at least one semester of college and have not completed a degree.
Institution taken from first term of enrollment.

4 Ibid.

To better understand if there is a relationship between early academic success and stop out, we plot the percentage of four-year WA public college enrollees who stopped out by the percentage of attempted credits students earned in their first term. Figure 4.6 indicates that four-year college enrollees who earned a smaller proportion of attempted credits in the first term were more likely to stop out. These patterns were similar for students enrolled in two-year colleges (see Appendix Figures A.4-A.5).

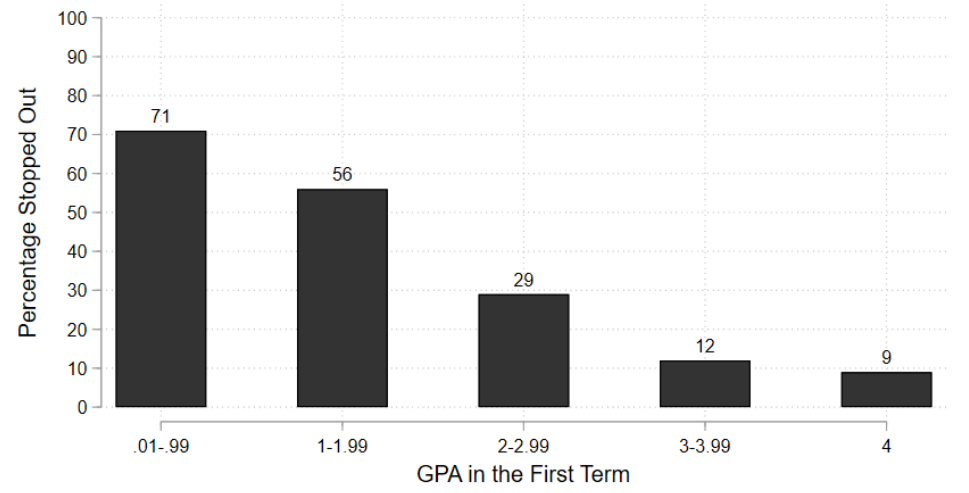
Figure 4.6 Percentage of 4-Year College Enrollees Who Stopped Out by Percentage of Attempted Credits Earned in the First Term



Sample includes classes of 2013 and 2014 who attended WA public colleges measured within six years after college entry.
Stopout defined as students who have enrolled in at least one semester of college and have not completed a degree.
Institution taken from first term of enrollment.

We also review stop out rates by GPA in the first term in Figure 4.7.[5] Similarly, we see that students who earned better grades in their first semester at WA public colleges were less likely to stop out than those who did not perform as well. These figures highlight the importance of early momentum in predicting longer-term success and indicate that institutions may want to provide additional support to students who earn a limited number of credits or perform poorly in their first term.

Figure 4.7 Percentage of 4-Year College Enrollees Who Stopped Out by GPA in the First Term



Sample includes classes of 2013 and 2014 who attended WA public colleges measured within six years after college entry.
Sample only includes students enrolled in Washington 4-year public colleges. Stopout defined as students who have enrolled in at least one semester of college and have not completed a degree.
Institution taken from first term of enrollment.

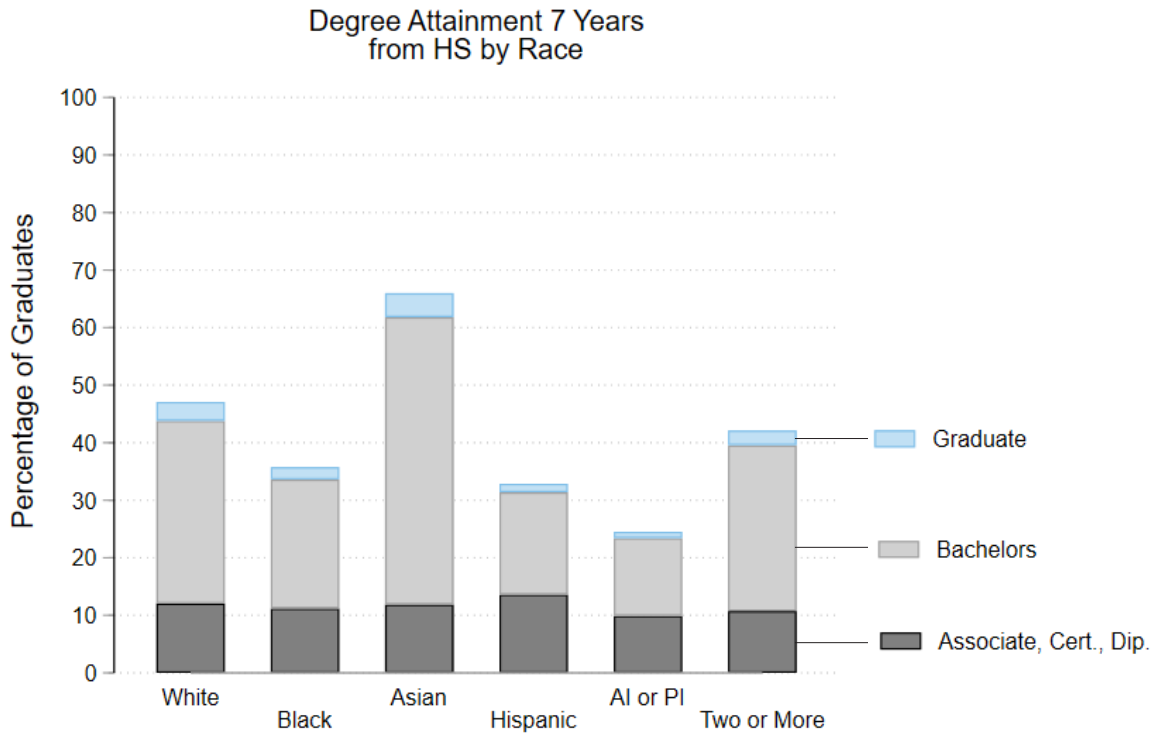
5 We were unable to repeat these analyses for two-year enrollees due to data availability.

Key Finding 5: The drivers of educational attainment vary by student demographics.

While Black students have favorable college-going rates compared to students from other racial/ethnic groups when accounting for high school achievement, they were among the most likely group to stop out. These stop out rates place Black students among the least likely to earn a college credential by 10 years from high school graduation. Hispanic and AI/PI students may also face barriers to entry and completion that drive their lower attainment rates.

In Key Finding 5, we explore how student educational outcomes vary by their demographic characteristics. We begin by plotting the percent of Washington high school graduates by highest credential and race/ethnicity. Figure 5.1 shows that White and Asian graduates were most likely to earn postsecondary credentials. Meanwhile, Black, Hispanic, and American Indian/Pacific Islander (AI/PI)[6] students were far less likely to complete college—with completion rates ranging from 25-35%. These results are similar to national patterns in credential completion among people aged 25-29.[7]

Figure 5.1 Degree Attainment Seven Years from High School by Race



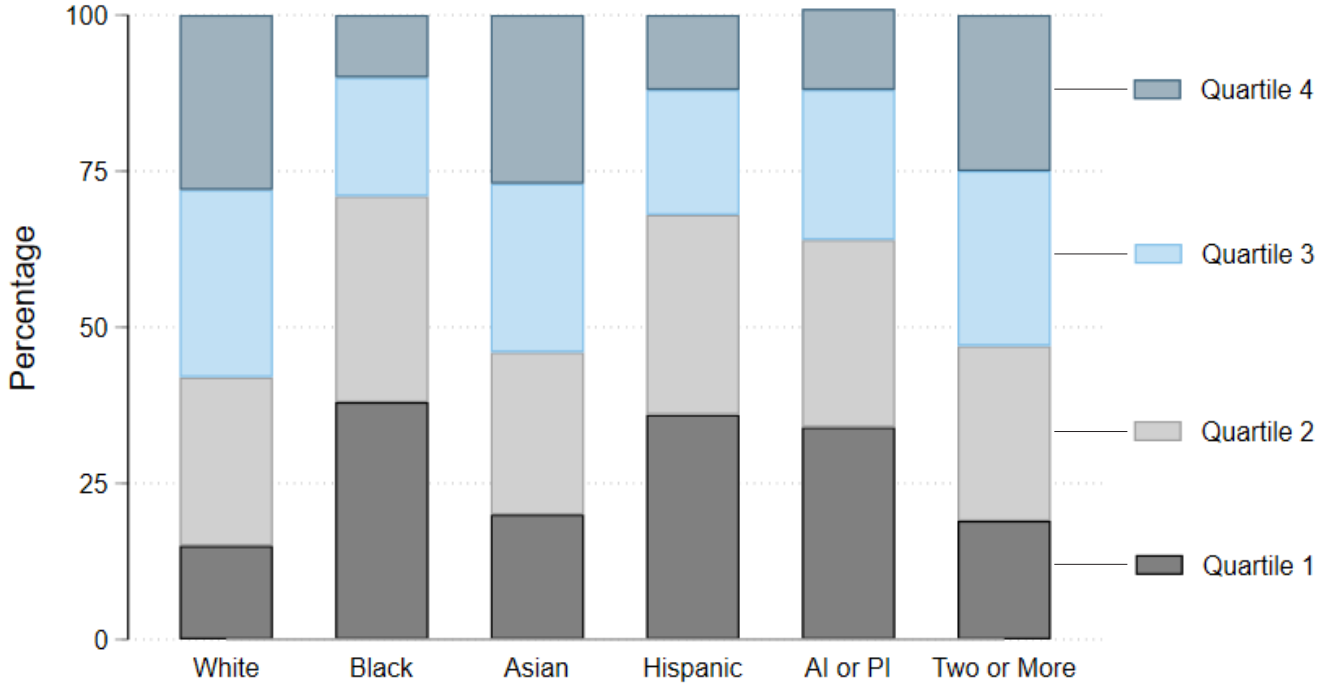
Sample includes classes of 2013 and 2014.

6 We collapsed racial/ethnic categories for American Indian and Pacific Islander students into one due to small cell sizes.

7 National Center for Education Statistics. (2023). Educational Attainment of Young Adults. Condition of Education. U.S. Department of Education, Institute of Education Sciences. Retrieved October 18, 2024, from **https://nces.ed.gov/programs/coe/indicator/caa**.

Given that students who performed better in high school were more likely to earn credentials (shown in Key Finding 3), it could be the case that the gap in attainment for Black, Hispanic, and AI/PI students may be linked to differences in academic preparation. Prior research indicates that students of color are less likely to access academic supports and experiences that can bolster test grades (57–58). As such, it is possible that these students were more likely to score in lower quartiles of the Reading and Writing High School Proficiency Exam and we can attribute their attainment patterns to overall lower test scores. Figure 4.2 lends some evidence to this point, as we see that there were larger proportions of Black, Hispanic, and AI/PI students in the lower quartiles of ELA achievement and higher proportions of White and Asian students were in the upper quartiles of prior achievement.

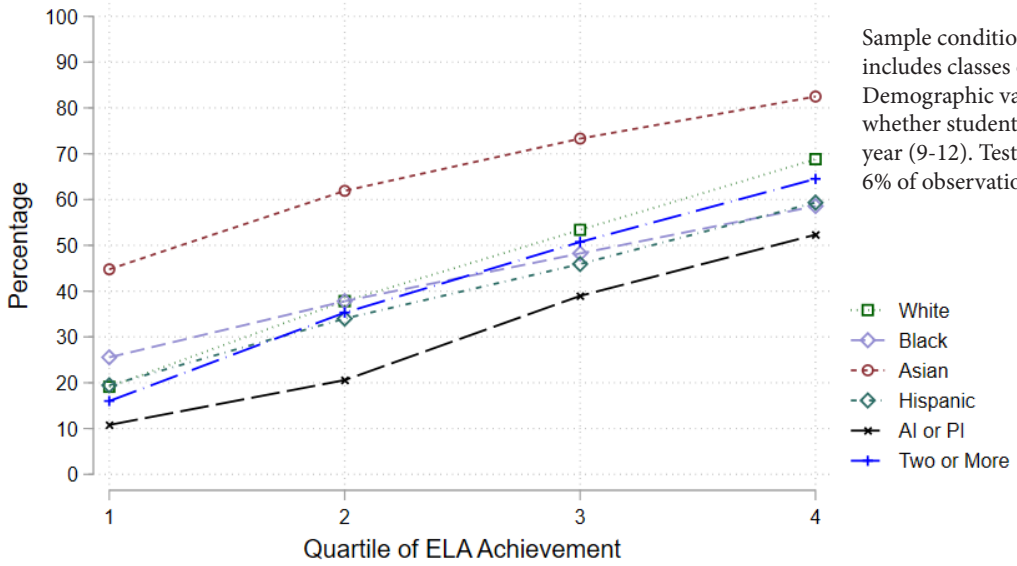
Figure 5.2 Percentage of Quartile of ELA Achievement by Race



Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12). Test scores used are HSPE ELA. 6% of observations are missing test scores.

However, when we repeat our analyses of completion patterns considering student test score, we see that gaps in credential attainment among Black, Hispanic, and AI/PI students remained even when students are compared to similarly achieving peers. Figure 5.3 divides high school graduates in each racial/ethnic group into four quartiles, state-wide, based on their average test scores on the Reading and Writing High School Proficiency Exam. This chart shows that Black, Hispanic, and AI/PI students in the upper three quartiles were less likely to earn a postsecondary credential than their White and Asian peers. This indicates that academic preparation alone cannot explain gaps in credential attainment among Black, Hispanic, and AI/PI students.

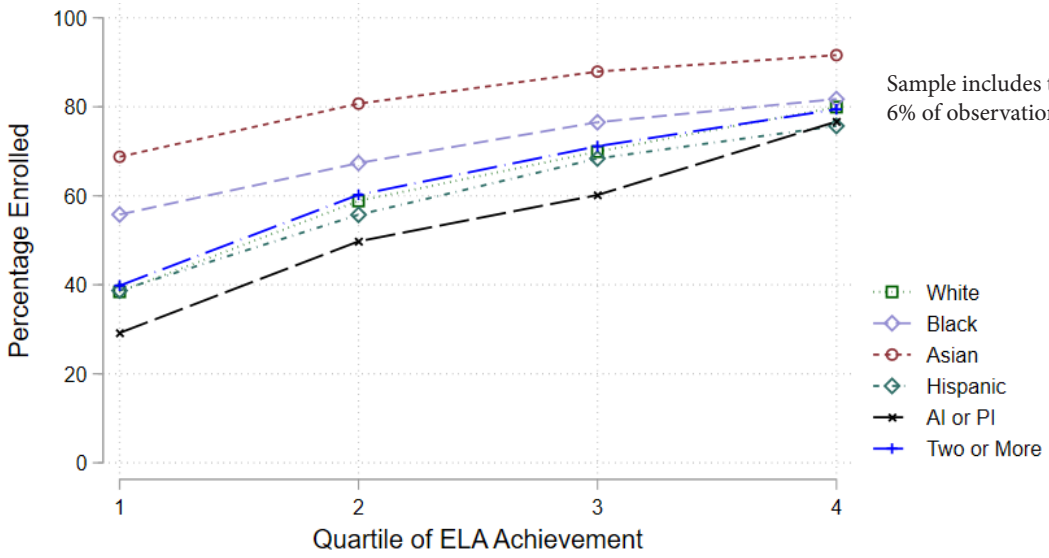
Figure 5.3 Percentage Earned Postsecondary Credential within Seven Years of High School by Race and Quartile of ELA Achievement



Sample conditional on high school graduation and includes classes of 2013 and 2014. Demographic variables calculated based on whether student belongs to group in any observable year (9-12). Test scores used are HSPE ELA. 6% of observations are missing test scores.

To explore potential root causes of these achievement disparities, we plot college entry and stop out rates by race and ethnicity. Beginning with college entry, Figure 5.4 shows that for the bottom quartile of math achievement, the probability of enrolling in college ranged from 30% for AI/PI students to around 70% for Asian students, a gap of around 40 percentage points. These gaps were consistent across the bottom three achievement quartiles, with Hispanic and AI/PI students being the least likely to enroll in college. Interestingly given their completion rates , Black students in each of these quartiles were more likely to attend college than all except Asian students. These patterns shift in the top quartile where all except Asian students were similarly likely to attend. As shown in Figure 5.2, the composition of students within each quartile also varied. While Black students were more likely to fall in the lower quartiles of achievement, their college enrollment rates were similar to or greater than students from most other racial groups. This suggests that focusing on early academic preparation and support may be an important lever for increasing college entry among Black students.

Figure 5.4 Percentage Enrolled in College One Year After High School by Race and Quartile of ELA Achievement



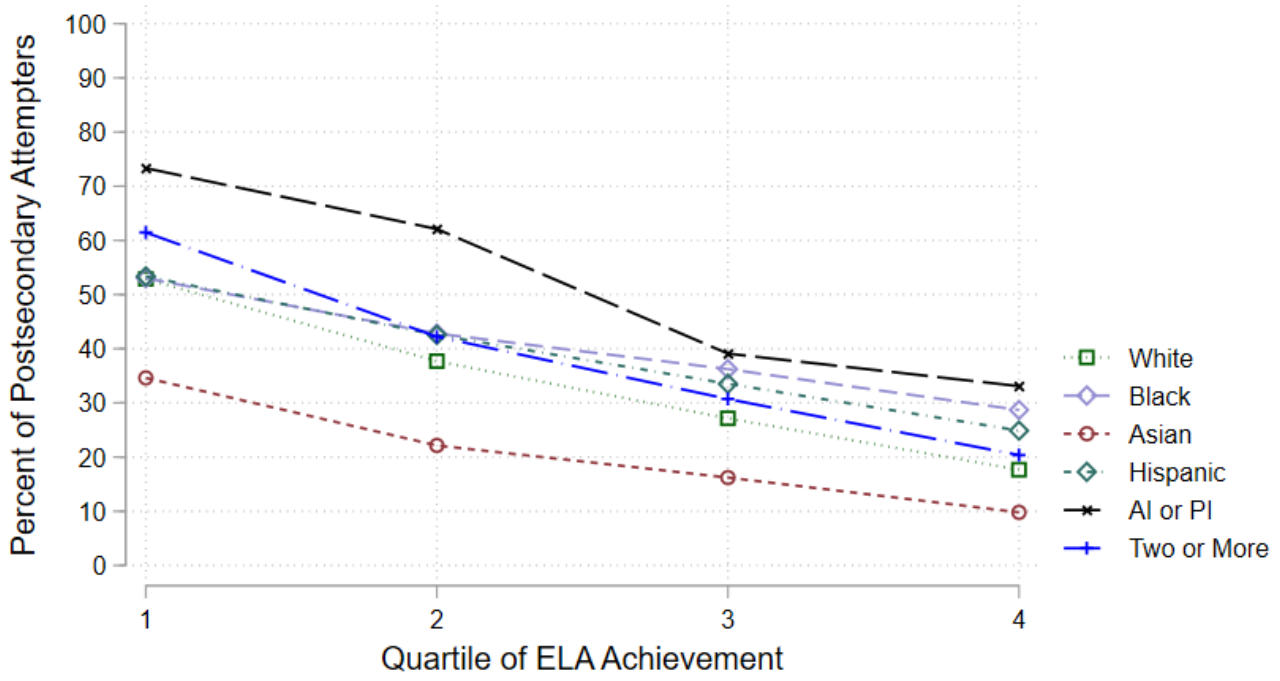
Sample includes the classes of 2013 and 2014. 6% of observations are missing test scores.

Turning to stop out, Figure 5.5 suggests that Black, Hispanic, and AI/PI students were most likely of all their peers to stop out of college once enrolled. Indeed, 55%, 50%, and 60% of Black, Hispanic, and AI/PI students who attempted college stopped out, respectively. As such, it appears that the relatively low attainment rates among AI/PI and Hispanic students as compared to their White and Asian peers is driven by both their lower likelihood of college entry and lower likelihood of completion.

Considering their favorable college-entry rates, the results shown in Figure 5.5 indicate that the lower college completion rates for Black students are driven largely by stop out. Given the relatively consistent patterns in stop out across quartiles of prior achievement, these results also suggests that Black, Hispanic, and AI/PI students face other barriers to degree completion beyond only academic preparation, which prior research suggests could be financial constraints or adverse experiences in the classroom or on campus (14–17).

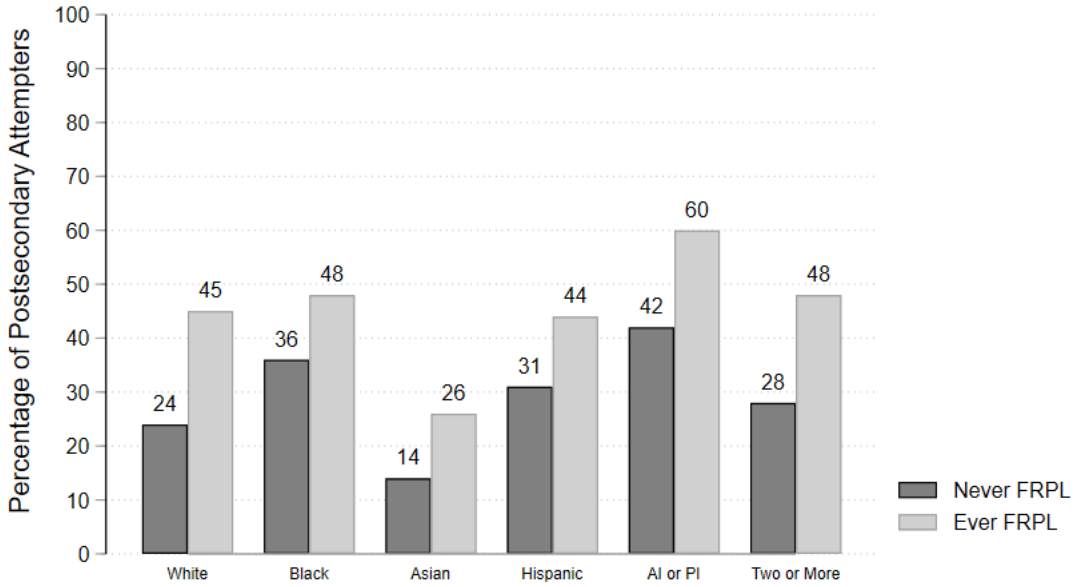
To understand whether financial constraints are related to stop out patterns across racial ethnic groups, we plot the percentage of students who stop out by race/ethnicity and FRPL eligibility status. As shown in Figure 5.6, we see that, regardless of FRPL status, AI/PI students were still the most likely to stop out. However, White, Black, Hispanic, and multi-racial students receiving FRPL were similarly likely to leave college before degree completion. This implies that socioeconomic status may be an important influence on students' likelihood of persisting to degree completion.

Figure 5.5 Percentage of Postsecondary Attempters Who Stopped Out by Race and Quartile of ELA Achievement



Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12). Test scores used are HSPE ELA. 6% of observations are missing test scores.

Figure 5.6 Percentage of Postsecondary Attempters Who Stopped Out by Free and Reduced Price Lunch Status and Race



Sample includes classes of 2013 and 2014 measured six years after college entry (82% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
6% of observations are missing test scores.

ELL students, those who received SPED services, those with SPED and ELL services, those who were eligible for FRPL, and students who experienced homelessness had lower credential completion rates than their peers. Credential completion among these groups is driven by both lower college entry and higher stop out rates.

Additional analyses (shown in appendix figures A.6-A.20) find that there are disparities in attainment based on other student characteristics. Specifically, ELL students, those who received SPED services, those with SPED and ELL services, those who were eligible for FRPL, and students who experienced homelessness were less likely to attain a college credential. These patterns remained when accounting for student test scores.

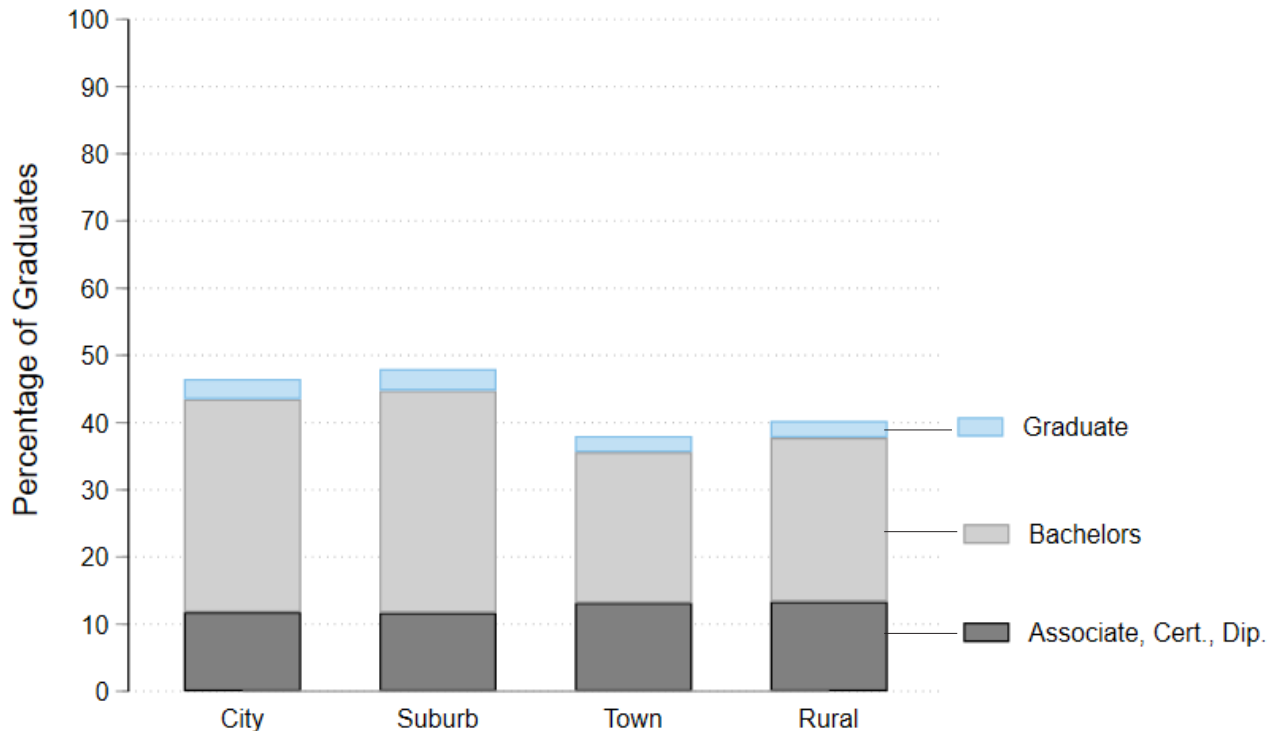
Analyses examining college enrollment show that these students were less likely to enroll than students who do not share those characteristics. Finally, stop out analyses demonstrate that students in these populations were more likely to stop out than their peers. The similarities in college-going and stop out patterns for these student populations suggest that increasing attainment will require intervention at the secondary and postsecondary levels.

Key Finding 6: Attainment rates lag for students from rural and town locales.

Students from rural and town locales were around 10 percentage points less likely to complete postsecondary degrees than their suburban and urban peers.

Here we examine credential attainment by school characteristics, specifically high school locale. System conditions can help or hinder students' educational outcomes. Prior research indicates that students from rural areas may face barriers to college access and completion (31–34). Nationally, between 2017–21, the share of working-age adults (ages 25–64) with at least an associate degree was 45 percent in urban areas and 31 percent in rural areas (34). Our analyses in Washington generally reflect these trends. We find that students in rural and town high schools were around 10 percentage points less likely to complete any college credential than their peers from cities or suburbs (Figure 6.1). Rural and town students also earned fewer bachelor's degrees.

Figure 6.1 Degree Attainment Seven Years from High School by Locale

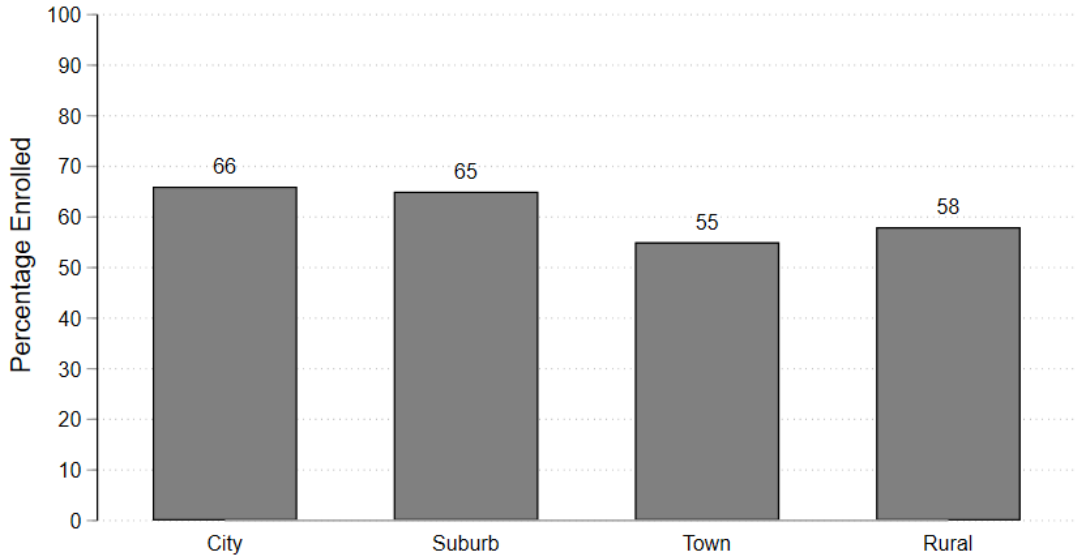


Sample includes classes of 2013 and 2014 measured six years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
6% of observations are missing test scores.

Attainment rates are largely driven by lower postsecondary enrollment rates for rural and town students.

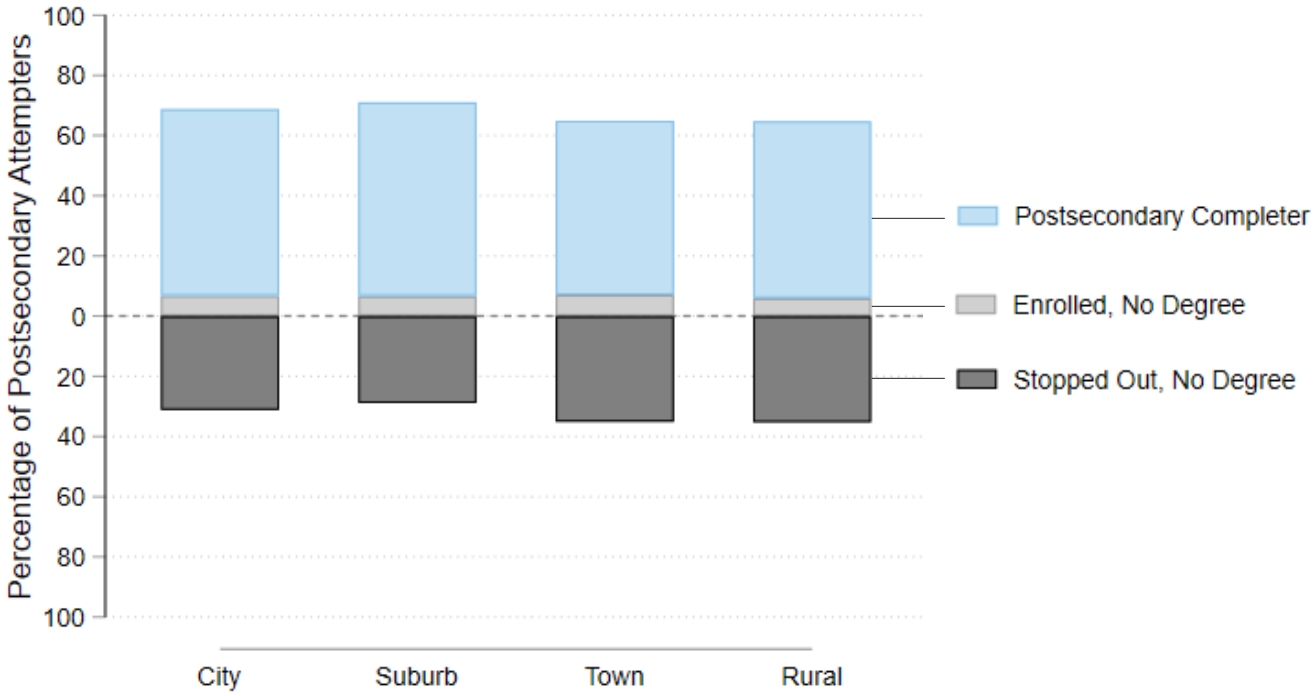
When investigating the drivers of lower attainment rates in rural and town locales, we find that college entry plays a larger role than stop out. As seen in Figure 6.2, students in town and rural locales were between seven and 11 percentage points less likely to enter college than their city and suburban peers. In contrast, Figure 6.3 indicates that, while students from town and rural locales were more likely to stop out than their peers, the difference in stop-out rates was small (about a 5-percentage point difference). These findings suggest that interventions aimed at closing the college-going gap, rather than closing a small college-stop-out gap, may be a more efficient way to target differential attainment rates by geography.

Figure 6.2 Percentage Enrolled in College One Year After High School by Locale



Sample conditional on HS graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).
50% of observations missing Geometry scores, 66% missing Algebra 1, 6% missing ELA.

Figure 6.3 Percentage of Postsecondary Attempters by Enrollment Status Six Years After College Entry by Locale



Sample includes classes of 2013 and 2014 measured six years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.

Workforce Outcomes

The second section of this diagnostic leverages wage data for Washington's high school graduates to explore earnings across educational attainment and student background characteristics. We provide context to these analyses by benchmarking wages against the MIT living wage threshold.[8] The results of these analyses will provide critical information about which educational pathways provide living wages and for whom. The results will also help Washington determine whether the types of degrees necessary for meeting workforce needs are worth the investment for students. Please see footnote for important information about the sample, limits of unemployment insurance data, and potential bias.[9]

Key Finding 7: College graduates earn more at work.

Students with bachelor's degrees experienced the largest earnings premiums.

We begin by examining earnings seven years out from high school for the graduating classes of 2013 and 2014.[10] Figure 7.1 below plots mean earnings (vertical axis) against the highest credential (horizontal axis) a worker attained seven years out of high school, benchmarked against the living wage threshold (dotted red line). Individuals who had not obtained any further qualifications seven years out from high school earned on average $37,864 (about $6,000 over the living wage threshold of $31,841). Earnings premiums relative to a high school degree are small below the bachelor's level. Workers with an undergraduate certificate, postsecondary diploma , or associate degree earned only $1,101 (3 percent) more on average than those with a high school degree. The largest earnings premiums arise for credentials at the bachelor's level. Workers with a bachelor's degree earn on average $52,924—40 percent more than those with no more than a high school degree seven years after high school graduation.

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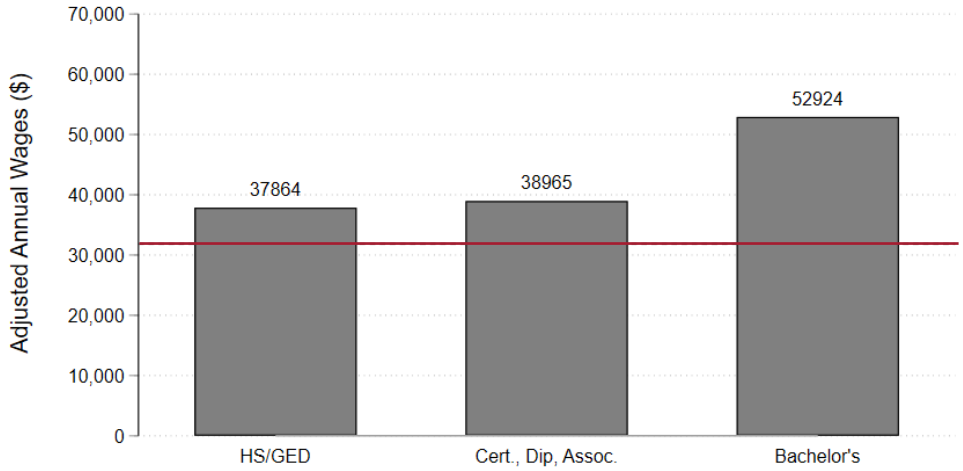
8 The average living wage for one person with no children, inflation adjusted, for the cohorts we observe is $31,841. See https://livingwage.mit.edu/ for methodology.

9 The wage data housed in most state P20W systems are derived from unemployment insurance data. While these data cover most employed in the state, there are several key sources of missingness that will affect estimates of the returns to college. UI data only include those working in the state and do not include federal and self-employment. In our analyses, we are only able to observe wages for about 60% of our sample. As such, we are unable to distinguish between unemployed persons and those who have left the state for other employment, are federal employees (military), or are self-employed. As such, earnings estimates generated by work using state UI wage data may be subject to bias due to systematic differences in rates of migration, unemployment, labor force participation, and selection into non-covered employment. If unemployment is higher among people with only a high school diploma, we may be underestimating the wage differential between high school and college. If people with more advanced degrees are more likely to move out of state and those who move out of state are likely to be higher earners, excluding the out-of-state earners (zero earnings in state) may be further underestimating the wage differential. To deal with individuals with missing wages, we dropped students without positive wages in the time measured. In addition to contending with completely missing wages in a given time period, we must also consider how to approach individuals who are missing some, but not all quarters of wage data in a year. Prior work generally either drops individuals with any missing wage quarters in a year or drops those with more than one wage quarter and imputes the missing quarter. In this diagnostic, we used the following procedure: dropped individuals with more than one missing wage quarter in a year, linearly imputed the missing quarter using data from other wage quarters in a given year, and dropped observations with imputed wage values below the 1st or above the 99th percentiles (with dollar values of X and Y, respectively).

10 We only included individuals with 3 or 4 wage quarters observed in that 10th year. For those with 3 wage quarters we linearly imputed the missing wage quarter.

Figure 7.1 Mean Wages by Highest Degree Seven Years after High School Graduation Benchmarked Against the Living Wage Threshold



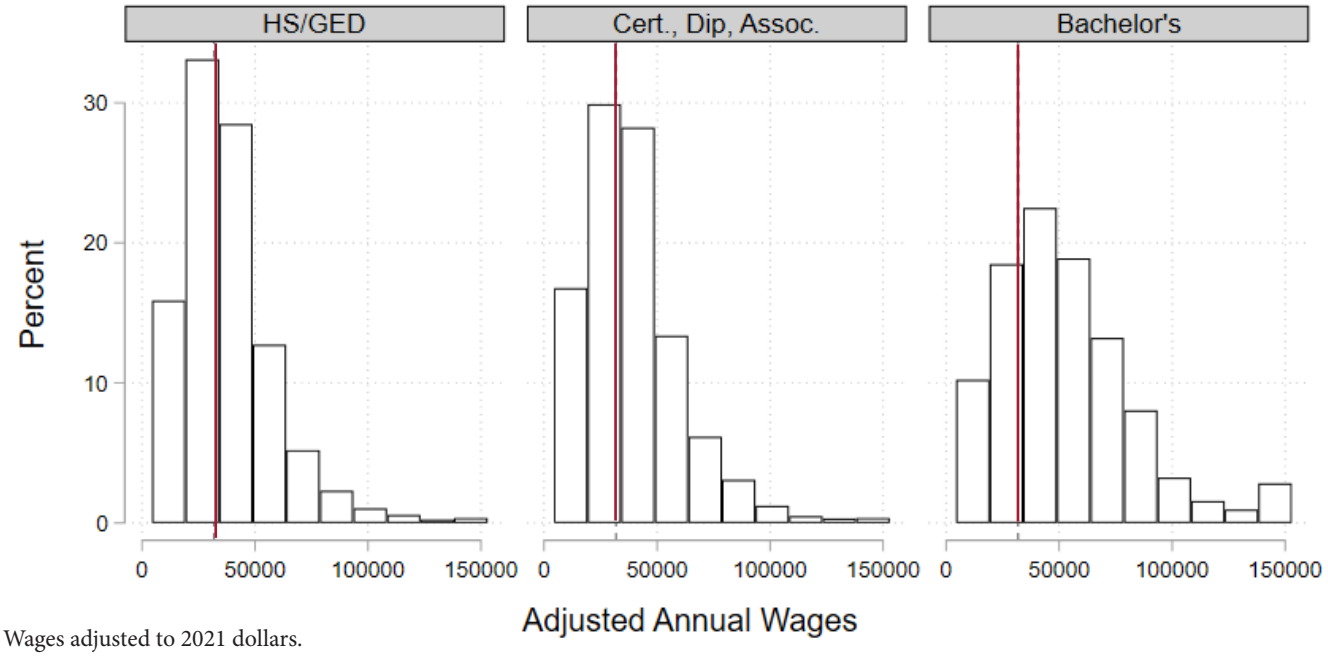
Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

Nearly 50% of workers with only a high school degree did not earn over the living wage threshold in Washington as compared to only 15% of those with bachelor's degrees.

While our findings in Figure 7.1 demonstrate that the average wages for workers in our sample are above the living wage threshold, this chart does not lend insight into the proportion of earners within credential type who pass this threshold. It is possible that reporting the mean masks substantial wage variation within credential type, which may lead us to miss populations of workers who earn below the threshold. To examine how wages vary within credential type, we show the distribution of earnings for each credential (Figure 7.2). For this analysis, we bin incomes into 10 groups at roughly $15,000 intervals; the height of bar corresponds to the percentage of individuals per credential type with earnings within that income group.

Like Figure 7.1, we see that those with college credentials generally earn more than those with high school diplomas. When examining the distribution of earnings relative to the living wage threshold, we see that, for bachelor's degree recipients, there are a larger proportion of workers earning wages to the right of (or higher than) the threshold. 50 percent of individuals with only a high school degree did not earn over the living wage threshold in Washington—this number shrinks to about 28 percent for those with bachelor's degree. These findings indicate that high school diploma holders face challenges in securing high-paying jobs, as they often lack specialized skills or advanced training. This highlights the importance of investing in programs that provide vocational training and skill development opportunities for individuals without higher education qualifications. Bridging this gap can lead to increased earning potential and alleviate poverty among these workers.

Figure 7.2 Mean Wages by Highest Degree Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold



Wages adjusted to 2021 dollars.
Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

Key Finding 8: Credentials alone do not determine wages. The wage premium associated with earning a college credential varies by student characteristics.

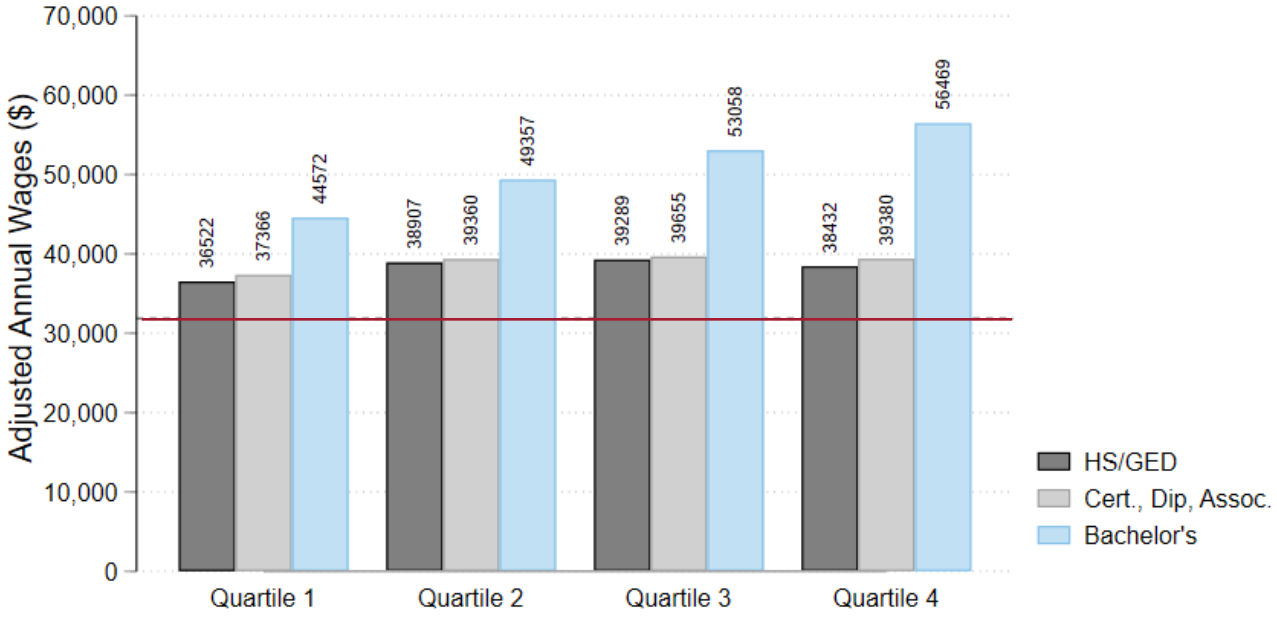
Wages differ even among individuals who completed the same credential. Those who scored better on the High School Proficiency Exam earned more.

The analyses in Key Finding 8 disaggregate the prior earnings analyses by credential type by performance on the Reading and Writing High School Proficiency Exam and other demographic characteristics. Figure 8.1 plots mean wages (vertical axis) by test quartile (horizontal axis), distinguishing between highest degree attained by color of bar. In general, across credential types, mean earnings for those who scored lowest on the test (the left-most set of bars) were lower than students who scored highest on the test (the right-most set of bars).

When looking at earnings of workers with postsecondary credentials relative to those with a high school diploma, we again find that the wage premium is largest for those with bachelor's degrees; however, we also see that the size of the premium increases across test score quartiles. For example, Figure 8.1 shows that workers with a top-quartile test score who hold a bachelor's degree earned 47 percent more than those with only a high school diploma or GED, while workers with a bottom quartile test score with a bachelor's degree earned 21 percent more than those with only a high school diploma or GED. These findings underscore the complex relationship between educational attainment, academic performance, and earnings. They also suggest that efforts aimed at adult education and workforce

training might be particularly beneficial for those who exhibited lower academic performance during high school.

Figure 8.1 Mean Wages by Highest Degree and Quartile of ELA Achievement Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold



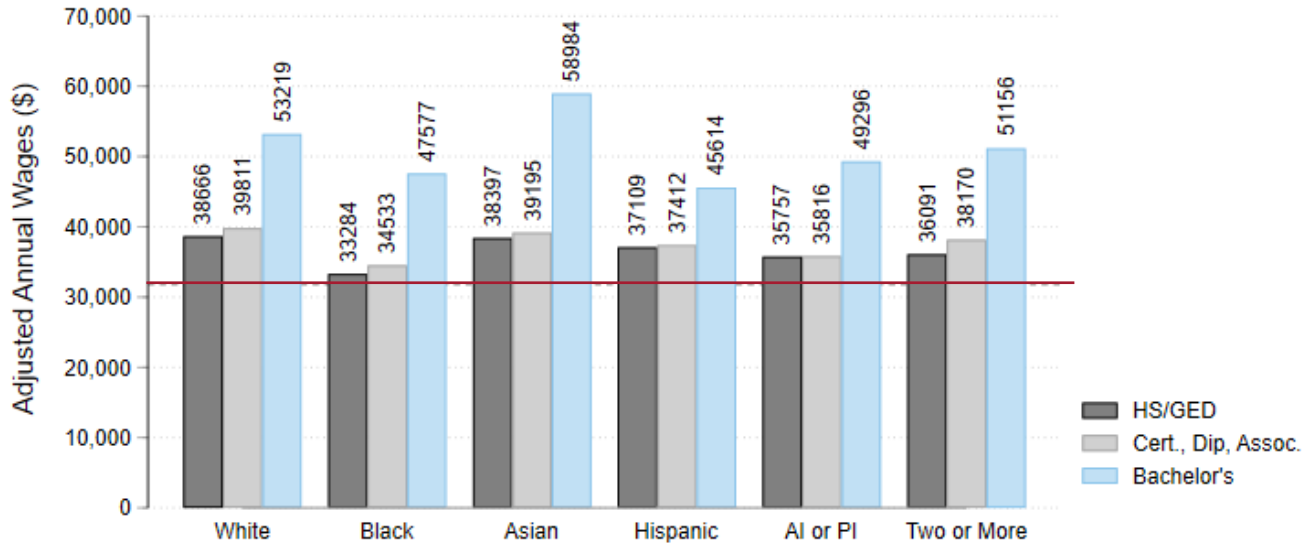
Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

A college degree does not erase racial differences in earnings. Racial earnings gaps are persistent across credential types and prior achievement.

To examine how wages further vary by student characteristics, we plot mean earnings seven years after high school graduation by four racial/ethnic groups and highest credential, distinguishing between credentials by color (seen in Figure 8.2). This plot shows earnings disparities across credential types with white and Asian workers earning more than their peers, irrespective of credential type.

For example, Black workers with a high school diploma or GED; associate, certificate, or diploma; or bachelor's degree earn on average 16 percent, 16 percent, and 11 percent less than White workers with the same credential. Racial earnings gaps are even more stark when we consider differences between Asian and Black workers. Black workers with a high school diploma or GED; associate, certificate, or diploma; or bachelor's degree earn on average 15 percent, 14 percent, and 23 percent less than Asian workers with the same credential. These trends are similar among Hispanic, AI/PI, and multiracial workers. These findings underscore that, while higher levels of educational attainment generally correlate with higher wages, Black, Hispanic, AI/PI, and multiracial workers may still face barriers to financial security despite obtaining similar credentials as their White and Asian counterparts.

Figure 8.2 Mean Wages by Highest Degree and Race Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold



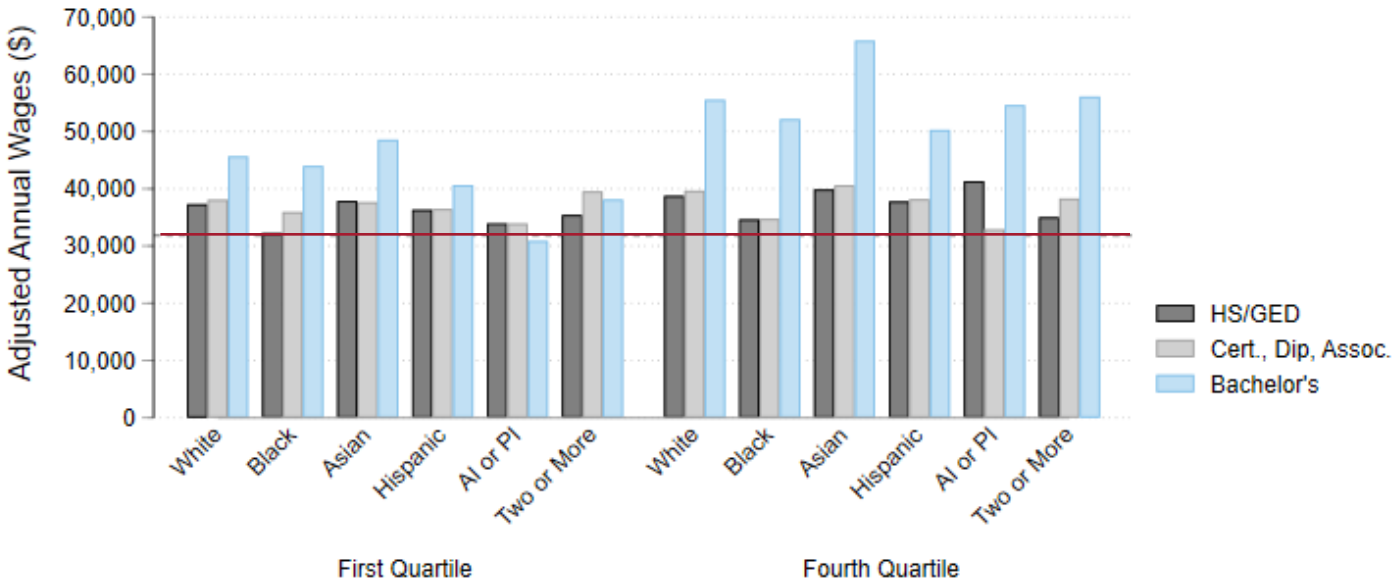
Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

We know from Figure 5.2 that White, Asian, Hispanic, and Black workers have very different test score profiles. In particular, 42 percent and 33 percent of White and Asian earners with a bachelor's degree, respectively, scored at the 75th percentile or above in the Reading and Writing High School Proficiency Exam, as opposed to just 17 percent of Black workers. Considering the relationship established in Figure 8.1 between higher test performance and increased earnings, we examine the extent to which the observed racial earnings gaps in Figure 8.2 can be related to differences in academic performance.

Figure 8.3 stratifies earnings by both race and by score quartile on the Reading and Writing High School Proficiency Exam. The figure plots mean earnings by racial and ethnic group (vertical axis) per credential type (colored bars) for workers who scored in the first (left panel) and fourth (right panel) quartiles of the test. Even among similarly achieving workers, Black, Hispanic, AI/PI, and multiracial workers earned less than their White and Asian counterparts. This suggests that those who belong to marginalized racial groups and earned lower test scores face compounded challenges in accessing higher-paying employment opportunities.

The differences in earnings within each test score group may partially stem from the varied composition of workers in these groups. For example, over 25% of Asian workers scored above the 75th percentile, whereas only 9% of Black workers achieved the same level. However, the earnings gap also reflects unmeasured factors such as the institutions attended by individuals from different racial backgrounds, their majors, and other employment-related characteristics. To account for a portion of this, we include an analysis that breaks out wages by demographic group, degree type, field of study (STEM vs non-STEM), and test score. We find that earning gaps by test score and racial ethnic group continue to persist even accounting for factors like college major (see Table 4).

Figure 8.3 Mean Wages by Highest Degree and Race Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold

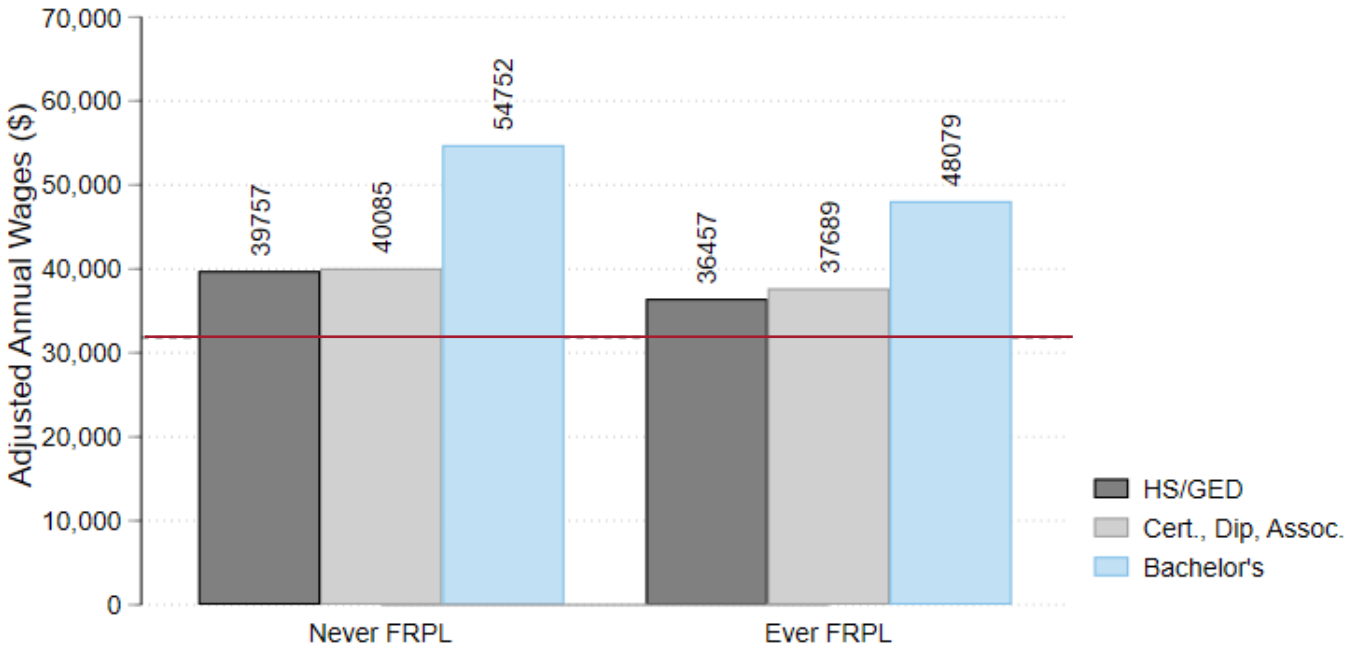


Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

Earning gaps were present across other dimensions of student demographics, such as pre-college socioeconomic status.

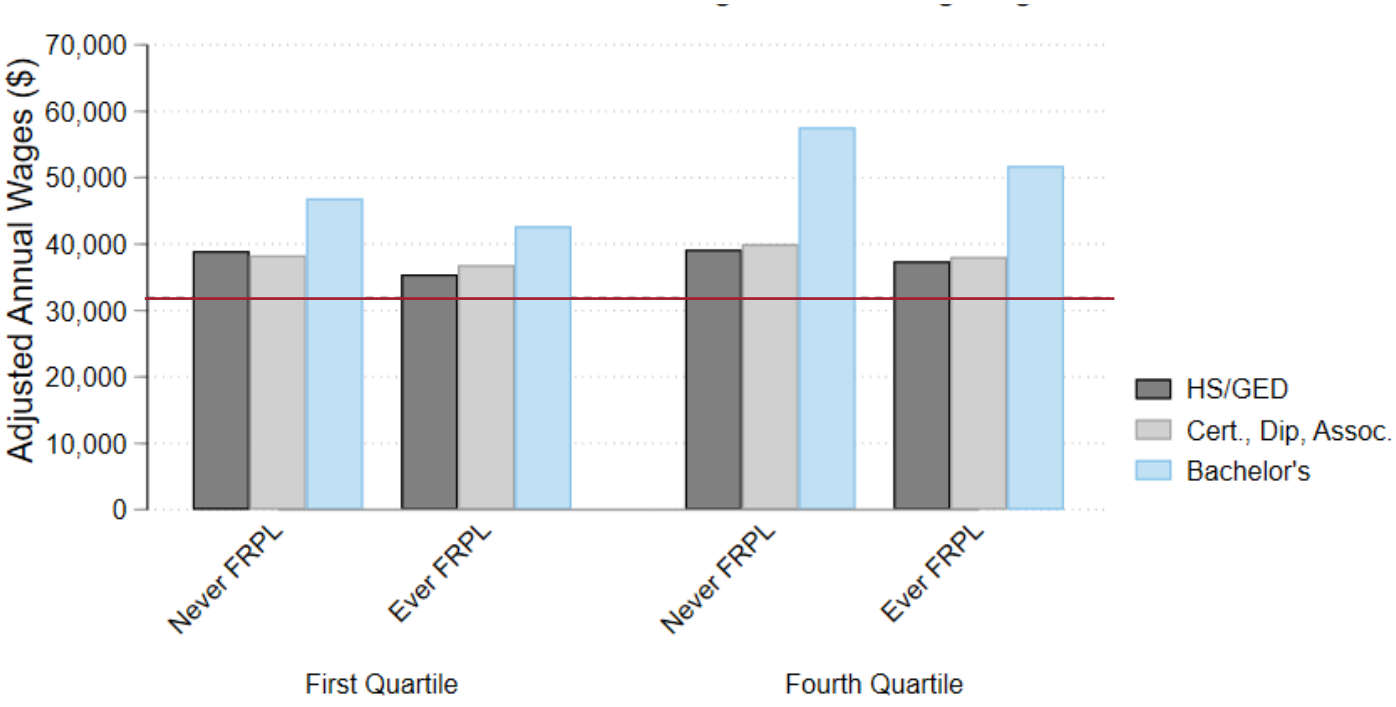
For other student groups, patterns in earnings were similar to those for race. Students receiving FRPL tended to earn less than their more advantaged peers, with the wage gap ranging from around $3,000 to $7,000, which reflects non-FRPL students' higher overall test scores (as seen in Figures 8.4 and 8.5).

Figure 8.4 Mean Wages by Highest Degree and Free and Reduced Price Lunch Status Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold



Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

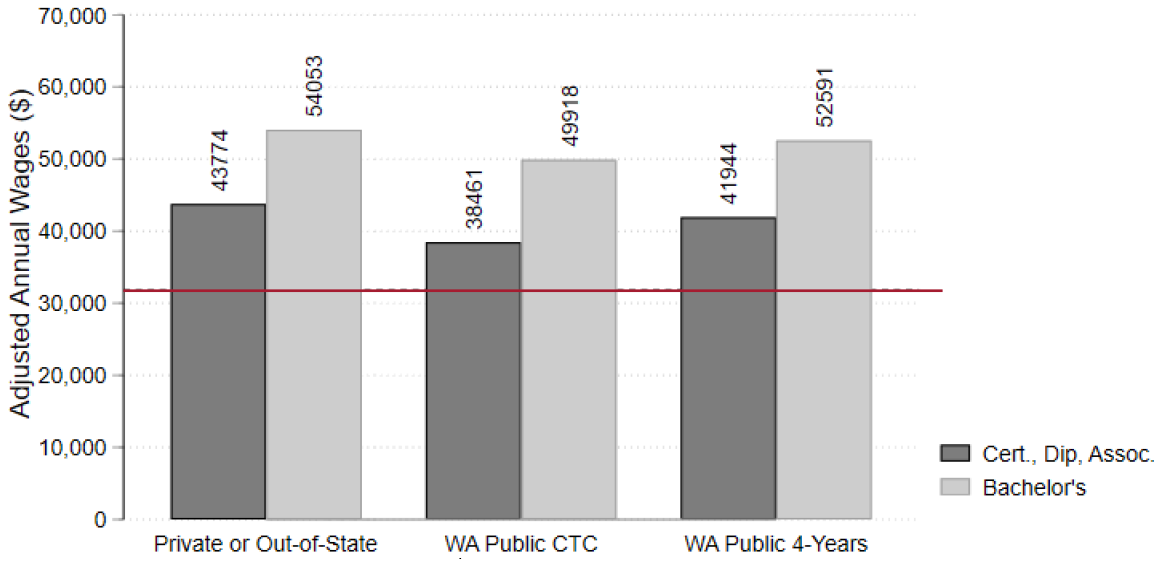
Figure 8.5 Mean Wages by Highest Degree and Free and Reduced Price Lunch Status Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold



Key Finding 9: The location and type of college a student attends matters for future earnings.

Given the investment that Washington makes in its public institutions, it is important to understand whether workers with credentials from these institutions are experiencing positive labor market outcomes. In Figure 9.1, we see that Washington workers with credentials from the state's public colleges earn less than those with degrees from private or out-of-state colleges. This difference is particularly large at the sub-baccalaureate degree level, where students who attended private or out-of-state colleges earned 17% more than those who attended Washington public colleges. These results should not be taken as proof that attending an out-of-state college causes higher earnings, because we are not accounting for student-level factors that influence a student's decision of where to go to college. For example, students who choose out-of-state colleges might come from wealthier families, which can affect their earnings, not just the college they attended.

Figure 9.1 Mean Wages by Highest Degree and College System Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold



Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator. Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed. Wages winsorized at the top and bottom 1st percentiles.

Key Finding 10: Professional and technical training pays off. Those with professional and technical degrees earn more than those with academic oriented degrees across credential levels.

Our last analyses in this section examine wages by field of study. Understanding how wages vary by field of study will allow Washington's leaders to identify whether majors that feed into high-demand

occupations yield competitive wages. To begin, we show average wages by credential type (horizontal axis), disaggregated by broad field of study (distinguished by color) for the full population (Figure 10.1), and for workers disaggregated by their score on the Reading and Writing High School Proficiency Exam (first and fourth quartiles, Figure 10.2). Grey bars correspond to wages for earners with academic credentials at each credential type; blue bars correspond to wages for those with professional and technical credentials.[11]

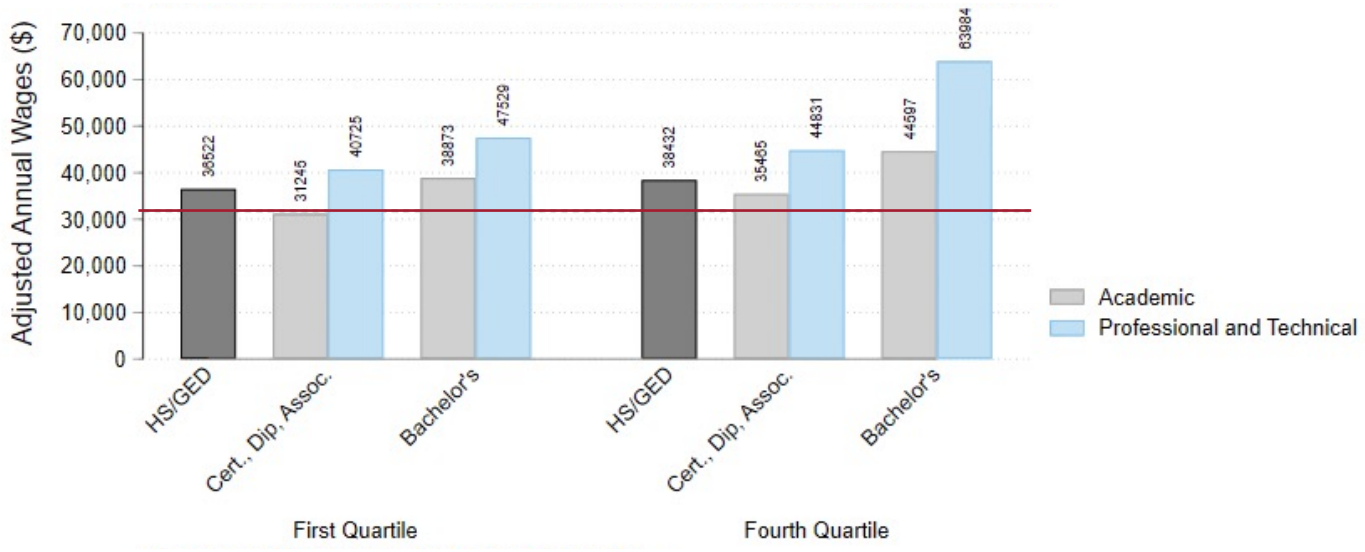
Examining first the plot in Figure 10.1: At each credential level, we see that workers with professional and technical degrees earn more. Further, reflecting previous findings, we see that the premium to a professional and technical degree, relative to a liberal arts degree, rises at higher credential levels, increasing from over $9,000 (27 percent) for workers with a sub-baccalaureate credential, to around $16,000 (37 percent) for workers with a bachelor's degree. These rising professional and technical premiums across higher credential types reflect primarily the professional and technical premium at higher credential levels for individuals with test scores in the fourth quartile. The rightmost plot in Figure 10.2 shows the pronounced professional and technical premium for workers with test scores in the fourth quartile. For example, workers with scores in the fourth quartile who had a professional and technical bachelor's degree earned on average 43 percent more than test takers in the same quartile with a liberal arts bachelor's degree. By contrast, workers with test scores in the first quartile who had a professional and technical bachelor's degree earned 22 percent more than test takers in the same quartile with a liberal arts bachelor's degree.

Figure 10.1 Mean Wages by Highest Degree and Broad Field of Study Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold

Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

11 To categorize degree programs, we rely on NCES' CIP taxonomy. https://nces.ed.gov/surveys/ctes/tables/postsec_tax.asp

Figure 10.2 Mean Wages by Highest Degree, Broad Field of Study, and Test Score Seven Years After High School Graduation Benchmarked Against the Living Wage Threshold

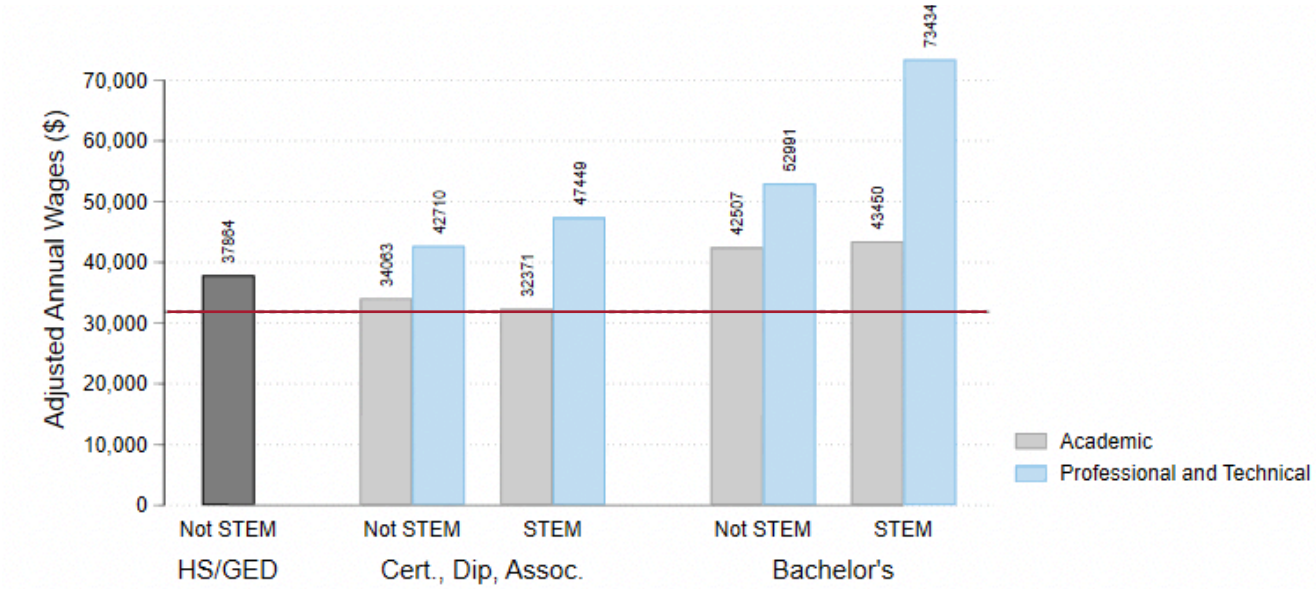


Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

It is possible that the wage premium associated with professional and technical credentials is driven by earners with certain types of credentials. Analyses shown in Appendix Figure A.21 demonstrate that individuals with STEM credentials earn between $6,000 and $11,000 more their peers with other types of credentials.[12] To understand whether those with STEM credentials drive the gap in earnings between liberal arts and STEM students, we plot mean wages by degree type, broad field of study, and whether the credential is classified as STEM. Reflecting the findings above, Figure 10.3 shows that students with professional and technical credentials earn more than those with academic degrees, regardless of whether the credential was classified as STEM. We do see, however, that the difference in earnings was largest at the bachelor's level, with those with STEM professional and technical degrees earning almost 40% more than BAs with non-STEM professional and technical credentials and 70% percent more than BAs with STEM academic credentials. As such, training in professional and technical fields may be beneficial; however, a portion of the wage premium for these credentials can likely be attributed to the STEM wage premium, particularly at the bachelor's degree level.

12 To classify STEM programs, we use the U.S. Department of Homeland Security (DHS) STEM Designated Degree Program List. https://nces.ed.gov/ipeds/cipcode/Files/stem-cip-codes2021.pdf

Figure 10.3 Mean Wages by Highest Degree, Broad Field of Study, and STEM Field of Study 7 Years After High School Graduation Benchmarked Against the Living Wage Threshold

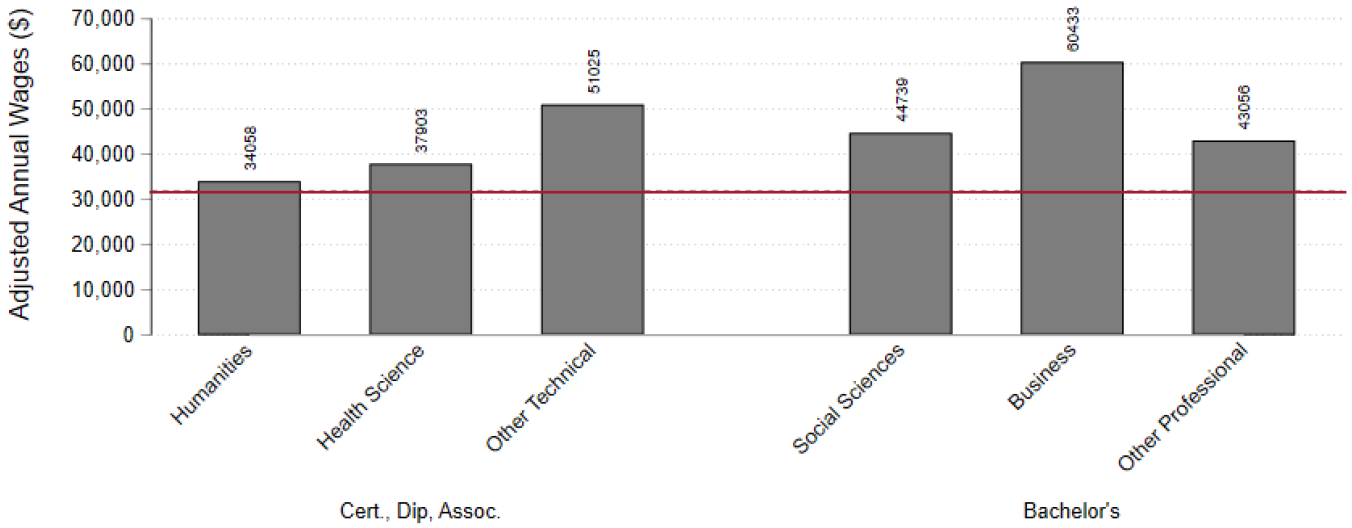


Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

To further understand how wages vary by degree type, we repeat the previous analyses, but now disaggregating individuals' highest credential by narrow field of study (as opposed to broad field).[13] For each credential level, we show the top three most popular degree types measured by enrollments (Figures 10.4 and 10.5). Figure 10.4 shows that students with technical or business degrees tend to earn more than their peers. As seen in Figure 10.5, some students with sub-baccalaureate certificates and diplomas in popular majors earn under the living wage. Students with ELA scores in the first quartile with humanities sub-baccalaureate credentials had especially low earnings, at $31,259, while workers with ELA test scores in the fourth quartile with these same credentials earned a living wage (earning on average $35,543).

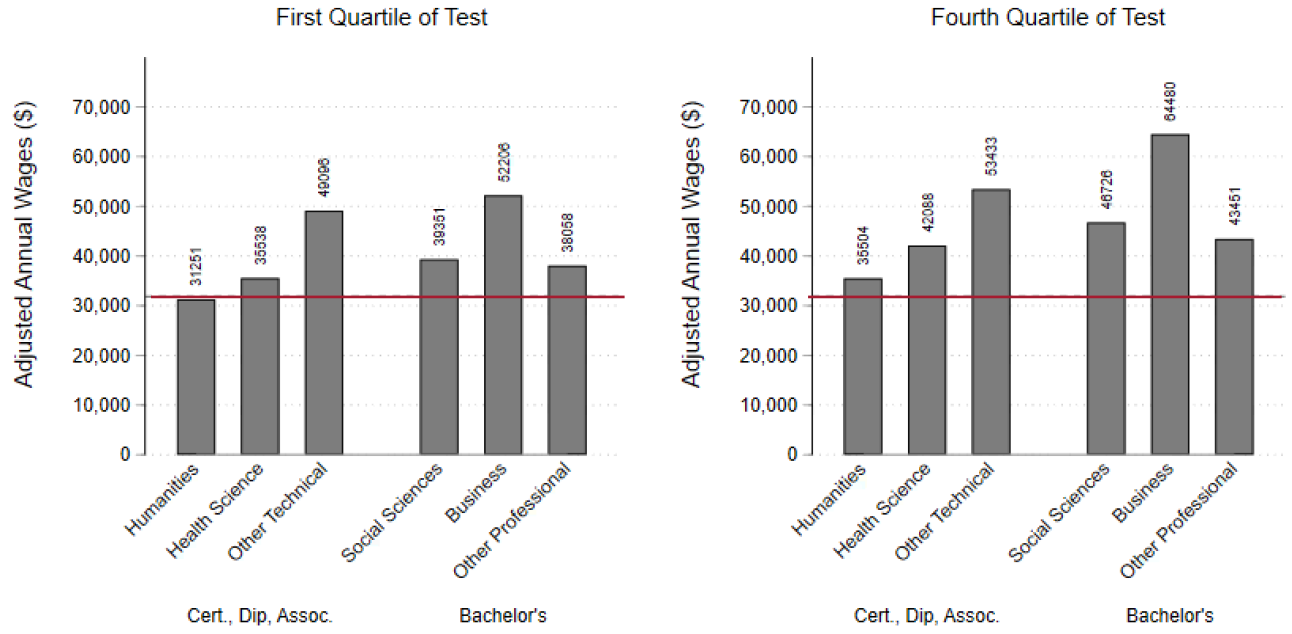
13 We group CIP codes using a taxonomy adapted from Dynarski, et al. (https://eric.ed.gov/?id=ED557080).

Figure 10.4 Mean Wages by Highest Degree and Top Three Most Popular Narrow Field of Study 7 Year After High School Graduation Benchmarked Against the Living Wage Threshold



Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

Figure 10.5 Mean Wages by Highest Degree and Three Most Popular Fields of Study 7 Years After High School Graduation Benchmarked Against the Living Wage Threshold



Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with three or four wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

The findings presented in this section underscore the significance of educational attainment, student demographics, and field of study in shaping individuals' earnings trajectories. While workers with bachelor's degrees generally experience substantial earnings premiums compared to those with only a high school diploma, not all students benefit equally from postsecondary credentials. Factors such as performance on the High School Proficiency Exam, race, and socioeconomic status seemed related to earning outcomes. Additionally, the variation in wages by field of study highlights the importance of aligning educational programs with high-demand occupations to ensure competitive wages and economic prosperity for all individuals.

CONCLUSION

The analyses presented in this diagnostic demonstrate that there are differences in credential attainment and earnings across students' academic, demographic, and school characteristics. For many students, completion rates seem to be driven by both low college entry rates and low completion rates among attempters. As such, increasing college attainment in Washington will likely necessitate interventions at the secondary and post-secondary levels.

Prior research suggests several evidence-based practices that schools can incorporate to improve college-going rates. In particular, the E-W Framework suggests incorporating financial aid advising and hands-on FAFSA assistance to decrease financial aid barriers to enrollment, as well as enhanced college advising in high schools aimed to help students find the right college fit for their goals (44). In addition, schools may consider targeting students' academic preparation as a means of increasing college-going. The Framework identifies several programs that have shown promise in increasing student achievement, such as high-impact tutoring, out-of-school programs, and intensive support tied to early warning indicators (45–49).

Research has also identified several key practices that may help colleges prevent stop out. These include co-requisite support, in which students receive developmental education support alongside their coursework; comprehensive and integrated advising that connects students to individualized academic and nonacademic supports; as well as mentoring/coaching related to education and career goals (50–53). See the Framework for a complete list (43). Secondary institutions can also play a role in setting their students up for postsecondary success. Programs such as early college/dual enrollment and personalized college advising have shown promise as tools that may increase degree completion (54–56).

Our analyses of wages show that overall, workers with college degrees earn more. This is a promising finding considering Washington's degree attainment goal, as students often consider future earnings when deciding to attend college. Our analyses also show a great deal of variation in earnings both by student background and field of study, which suggests that the return to college is not the same for every student. Efforts to increase the number of colleges educated workers in certain fields may require a closer look into the costs of these credentials. Additionally, the wage gaps we see by student background within credential type suggest a need for further analyses into the workforce outcomes of lower earning students. Prior work has shown that wage gaps can be attributed to both opportunity gaps, where certain workers are less likely hold management positions, as well as occupational segregation, where some are more likely to work in industries that generally pay less (13). Further inquiry into the types of positions workers hold and their industries may reveal policy and practice solutions that will help ameliorate wage gaps.

Endnotes

i Washington Student Achievement Council (2013). 2013 Roadmap. https://wsac.wa.gov/the-roadmap

ii Monear, D, Lundgren, M, Kenesson, S., Dulany, T., Wallace, D. & Gjertsen, T. (2022). Washington's Skilled and Educated Workforce. https://wsac.wa.gov/sites/default/files/2021-22.WashingtonsSkilledandEducatedWorkforceReport.pdf

iii Author's calculations using the 2022 American Community Survey, ACS 1-Year Estimates. recode%22%2C%22R%22%3A%22AGEP%22%2C%22W%22%3A%22PWGTP%22%2C%22V%22%3A%5B%5B%2200%22%2C%22Not%20Elsewhere%20Classified%22%5D%2C%5B%2225%3A44%22%2C%22Between%2025%20and%2044%22%5D%5D%7D

iv https://www.mathematica.org/projects/education-to-workforce-indicator-framework

v See Tables 1 and 2 for selected indicators and readings related to outcomes and disaggregates.

vi The average living wage for one person with no children, inflation adjusted, for the cohorts we observe is $31,841. See https://livingwage.mit.edu/ for methodology.

APPENDIX

Table 1: Outcomes and Associated Literature Mapped to Education-to-Workforce Framework Indicators

Outcome	Associated Literature	Education-to-Workforce Framework Indicator
Postsecondary enrollment within one year of high school graduation	1. Roksa, J. & Velez, M. (2012) A Late Start: Delayed Entry, Life Course Transitions and Bachelor's Degree Completion, Social Forces, 90(3), 769–794, https://doi-org.ezp-prod1.hul.harvard.edu/10.1093/sf/sor018 2. National Center for Education Statistics. (2019a). Table 302.20. Percentage of recent HS completers enrolled in college, by race/ethnicity: 1960 through 2018. Digest of Education Statistics. Institute of Education Sciences, U.S. Department of Education. https://nces.ed.gov/programs/digest/d19/tables/dt19_302.20.asp 3. Coca, V. M., Nagaoka, J., & Seekin, A. (2017). Patterns of two-year and four-year college enrollment among Chicago Public Schools graduates. University of Chicago Consortium on School Research. https://eric.ed.gov/?id=ED589667#:~:text=Nineteen%20percent%20of%202009%20CPS,year%20colleges%20within%20four%20years.	Postsecondary enrollment directly after high school graduation
Postsecondary credential completion	4. U.S. Bureau of Labor Statistics. (2021). Earnings and employment rates by educational attainment, 2020. U.S. Department of Labor, Bureau of Labor Statistics. https://www.bls.gov/emp/chart-unemployment-earnings-education.htm 5. Jepsen, C., Troske, K., & Coomes, P. (2014). The labor-market returns to community college degrees, diplomas, and certificates. Journal of Labor Economics, 32(1), 95–121. https://doi.org/10.1086/671809 6. Oreopolous, P., & Petronijevic, U. (2013). Making college worth it: A review of research on the returns to higher education. National Bureau of Economic Research. https://www.nber.org/system/files/working_papers/w19053/w19053.pdf 7. Tamborini, C. R., Kim, C. H., & Sakamoto, A. (2015). Education and lifetime earnings in the United States. Demography, 52(4), 1383–1407. https://dx.doi.org/10.1007%2Fs13524-015-0407-0 8. Altonji, J. G., & Zhong, L. (2016). The labor market returns to advanced degrees. Journal of Labor Economics, 39(2), 303–360. https://www.journals.uchicago.edu/doi/full/10.1086/710959	Postsecondary certificate or degree completion; Graduate degree completion

College stop out	9. National Student Clearinghouse (2023). Some college, no credential student outcomes. https://nscresearchcenter.org/wp-content/uploads/SCNCReport2023.pdf 10. National Student Clearinghouse (2022). National college progression rates. https://nscresearchcenter.org/wp-content/uploads/2022_HSBenchmarksReport.pdf	Postsecondary persistence
Earnings above a living wage	11. Nadeau, C. A. (2020). New living wage data for now available on the tool. Living Wage Calculator. https://livingwage.mit.edu/articles/61-new-living-wage-data-for-now-available-on-the-tool 12. Carnevale, A. P., Strohl, J., Gulish, A., Van Der Werf, M., & Campbell, K. P. (2019). The unequal race for good jobs: How Whites made outsized gains in education and good jobs compared to Blacks and Latinos. Center on Education and the Workforce, Georgetown University. https://eric.ed.gov/?id=ED600048 13. Zhavoronkova, M., Khattar, R., & Brady, M. (2022). Occupational segregation in America. Center for American Progress. https://www.americanprogress.org/article/occupational-segregation-in-america/	Access to jobs paying a living wage

Table 2: Disaggregate and Associated Literature Mapped to Education-to-Workforce Framework Indicator

Disaggregate	Definition	Associated Literature	Education-to-Workforce Framework Indicator/ Disaggregate
Race/ ethnicity	Student race/ethnicity	14. Belley, P., & Lochner, L. (2007). The changing role of family income and ability in determining educational achievement. Journal of Human Capital, 1(1), 37–89. https://doi.org/10.1086/524674 15. Chetty, R., Friedman, J., Saez, E., Turner, N., & Yagan, D. (2017). Mobility report cards: The role of colleges in intergenerational mobility. National Bureau of Economic Research. https://www.nber.org/papers/w23618 16. National Center for Education Statistics. (2019a). Table 302.20. Percentage of recent HS completers enrolled in college, by race/ethnicity: 1960 through 2018. Digest of Education Statistics. Institute of Education Sciences, U.S. Department of Education. https://nces.ed.gov/programs/digest/d19/tables/dt19_302.20.asp 17. Coca, V. M., Nagaoka, J., & Seekin, A. (2017). Patterns of two-year and four-year college enrollment among Chicago Public Schools graduates. University of Chicago Consortium on School Research. https://eric.ed.gov/?id=ED589667#:~:text=Nineteen%20percent%20of%202009%20CPS,year%20colleges%20within%20four%20years.	Race and Ethnicity

Homeless Status	Student was classified as experiencing homelessness	18. Sulkowski, M. L. (2016). The student homelessness crisis and the role of school psychology: Missed opportunities, room for improvement, and future directions. Psychology in the Schools. https://doi.org/10.1002/pits.21936 19. National Center for Education Statistics. (2018). Table 204.75a. Homeless students enrolled in public elementary and secondary schools, by grade, primary night time residence, and selected student characteristics: 2009-10 through 2016-17. Digest of Education Statistics, Institute of Education Sciences, U.S. Department of Education.	Individuals experiencing homelessness
Free and Reduced-Price Lunch Receipt	Whether a student received FRPL while in high school	20. National Center for Education Statistics. (2015). Educational attainment differences by students' socioeconomic status. Condition of Education. https://nces.ed.gov/programs/coe/pdf/coe_tva.pdf 21. National Student Clearinghouse. (2017). HS benchmarks 2017: National college progression rates. https://nscresearchcenter.org/hsbenchmarks2017/	Income Level
English Language Learner	A student or individual who is classified as an English language learner or as having limited English proficiency in high school.	22. National Center for Education Statistics. (2015b). Table 204.20. English language learner (ELL) students enrolled in public elementary and secondary schools, by state: Selected years, fall 200 through fall 2015. Digest of Education Statistics. Institute of Education Sciences, U.S. Department of Education. https://nces.ed.gov/programs/digest/d17/tables/dt17_204.20.asp 23. Wilson, J. H. (2014). Investing in English skills: The limited English proficient workforce in U.S. metropolitan areas. Brookings Institute. https://www.brookings.edu/research/investing-in-english-skills-the-limited-english-proficientworkforce-in-u-s-metropolitan-areas/	English learner

Advanced Math Course Enrollment	Whether a student took advanced coursework in high school (AP, IB, dual/joint enrollment)	24. Long, M. C., Conger, D., & Iatarola, P. (2012). Effects of High School Course-Taking on Secondary and Postsecondary Success. American Educational Research Journal, 49(2), 285-322. https:// doi.org/10.3102/0002831211431952 25. Byun, S. Y., Irvin, M. J., & Bell, B. A. (2015). Advanced Math Course Taking: Effects on Math Achievement and College Enrollment. Journal of Experimental Education, 83(4), 439-468. 26. Warne, R. T. (2017). Research on the academic benefits of the advanced placement program: Taking stock and looking forward. SAGE Journals, 7(1). https://doi.org/10.1177/2158244016682996	College preparatory coursework completion
High School Proficiency Exam Score	Quartile for student score on the Reading and Writing HSPE.	27. Duncan, G. J., Claessens, A., Huston, A. C., Pagani, L. S., Engel, M., Sexton, H., Dowsett, C. J., Magnuson, K., Klevanov, P., Feinstein, L., Brooks-Gunn, J., Duckworth, K., & Japel, C. (2007). School readiness and later achievement. Developmental Psychology, 43(6), 1428–1446. https://doi.org/10.1037/0012-1649.43.6.1428 28. The Nation's Report Card. (2019e). NAEP report card: Reading. National student group scores and score gaps. https://www.nationsreportcard.gov/reading/nation/groups/?grade=12	Math and reading proficiency in high school

Special Education Status	Whether a student received special education supports in high school.	29. National Center for Education Statistics. (2017). Trends in high school dropout and completion rates in the United States: Indicator 4: Adjusted cohort graduation rate. Institute of Education Sciences, U.S. Department of Education. https://nces.ed.gov/programs/dropout/ind_04.asp#:~:text=In%20 2016%E2%80%9317%2C%20the%20 U.S.,85%20percent% 20(table%204.1). 30. Altiraifi, A. (2019). Advancing economic security for people with disabilities. Center for American Progress. https://www.americanprogress.org/article/advancing-economic-security-people-disabilities/	Disability status
High School Locale	Locale of high school (rural, town, urban, suburban)	31. Croft, M., & Moore, R. (2019). Rural students: Technology, coursework, and extracurricular activities. ACT Center for Equity in Learning. https://eric.ed.gov/?id=ED596140 1350 32. National Center for Education Statistics. (n.d.). Rural education in America. Institute of Education Sciences, U.S. Department of Education, https://nces.ed.gov/surveys/ruraled/definitions.asp#:~:text=Urbanized%20areas%20and%20urban%20clusters,are%20designated%20as%20urban%20clusters 33. National Center for Education Statistics. (2023). The Condition of Education 2023. https://nces.ed.gov/programs/coe/pdf/2022/lbc_508.pdf 34. United States Department of Agriculture (2022). Educational attainment improved in rural America but educational gap with urban areas grew for bachelor's degrees and higher. https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=106147#:~:text=In%20 2017%E2%80%9321%2C%20the%20 share,22%20percent%20in%20rural%20 areas.	Urbanicity

Credit	Credits accumulated in the first term and at the time of stop out	35. Adelman, C. (2006). The toolbox revisited: Paths to degree completion from HS through college. U.S. Department of Education. https://www2.ed.gov/rschstat/research/pubs/toolboxrevisit/toolbox.pdf 36. Attewell, P., & Monaghan, D. (2016). How many credits should an undergraduate take? Research in Higher Education, 57, 682–713. https://doi.org/10.1007/s11162-015-9401-z 37. Belfield, C., Jenkins, D., & Lahr, H. (2016). Momentum: The academic and economic value of a 15-credit first semester course load for college students in Tennessee. Community College Research Center. http://ccrc.tc.columbia.edu/media/k2/attachments/momentum-15-credit-course-load.pdf	First-year credit accumulation

Table 3: Additional Literature

Citation	Topic
38. Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. Journal of Personality and Social Psychology, 92, 82–96. http://dx.doi.org/10.1037/0022-3514.92.1.82 39. Solórzano, D., Ceja, M., & Yosso, T. (2000). Critical race theory, racial microaggressions, and campus racial climate: The experiences of African American college students. Journal of Negro Education, 69, 60–73. 40. Hurtado, S., & Ruiz Alvarado, A. (2015). Discrimination and bias, underrepresentation, and sense of belonging on campus. Los Angeles: Higher Education Research Institute, University of California at Los Angeles.	Student college experiences
41. Perna, L. (2006). Studying college access and choice: A proposed conceptual model. In Smart J. (Ed.), Higher education handbook of theory and research XXI (pp. 99-157). Dordrecht, The Netherlands: Springer.	College choice

42. National Center for Education Statistics. (2023). Immediate College Enrollment Rate. Condition of Education. U.S. Department of Education, Institute of Education Sciences. Retrieved March 24, 2023, from https://nces.ed.gov/programs/coe/indicator/cpa.	College enrollment rate
43. Mathematica (2023) Educator-to-Workforce Framework. https://www.mathematica.org/projects/education-to-workforce-indicator-framework	Educator-to-Workforce Framework
44. What Works Clearinghouse (WWC). (2009d). Helping students navigate the path to college: What HSs can do. Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/PracticeGuide/11	Interventions related to postsecondary enrollment
45. What Works Clearinghouse (WWC). (2009a). Assisting students struggling with reading: Response to Intervention (RTI) and multi-tier intervention in the primary grades. Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/PracticeGuide/3 46. What Works Clearinghouse (WWC). (2009b). Assisting students struggling with mathematics: Response to Intervention (RTI) for elementary and middle schools. Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/practiceguide/2 47. What Works Clearinghouse (WWC). (2008). Improving adolescent literacy: Effective classroom and intervention practices. Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/PracticeGuide/8 48. Heinrich, C. J., Burch, P., Good, A., Acosta, R., Cheng, H., Dillender, M., Kirshbaum, C., Nisar, H., & Stewart, M. (2014). Improving the implementation and effectiveness of out-of-school-time tutoring. Journal of policy analysis and management, 33(2), 471–494. https://doi.org/10.1002/pam.21745 49. What Works Clearinghouse (WWC). (2009c). Structuring out-of-school time to improve academic achievement. Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/PracticeGuide/10	Interventions related to student academic achievement

50. Smith Jaggars, S., Hodara, M., Cho, S. W., & Xu, D. (2014). Three accelerated developmental education programs: Features, student outcomes, and implications. Community College Review, 43(1). https://ccrc.tc.columbia.edu/publications/three-accelerated-developmental-education-programs.html 51. What Works Clearinghouse (WWC). (2016c). Strategies for postsecondary students in developmental education—A practice guide for college and university administrators, advisors, and faculty. Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/PracticeGuide/23 52. Alamuddin, R., Rossman, D., & Kurzweil, M. (2018). Monitoring advising analytics to promote success (MAAPS): Evaluating findings from the first year of implementation. Ithaka S+R. https://doi.org/10.18665/sr.307005 53. Bettinger, E. P., & Baker, R. (2014). The effects of student coaching an evaluation of a randomized experiment in student advising. Educational Evaluation and Policy Analysis, 36(1), 3–19. https://doi.org/10.3102/0162373713500523 54. Shields, K. A., Bailey, J., Hanita, M., & Zhang, X. (2021). The effects of accelerated college credit programs on educational attainment in Rhode Island. U.S. Department of Education, Institute of Education Sciences, Regional Educational Laboratory Northeast & Islands. https://ies.ed.gov/ncee/rel/Project/5680 55. Edmunds, J. A., Unlu, F., Glennie, E., Bernstein, L., Fesler, L., Furey, J., & Arshavsky, N. (2017). Smoothing the transition to postsecondary education: The impact of the early college model. Journal of Research on Educational Effectiveness, 10(2), 297–325. https://eric.ed.gov/?id=EJ1135800 56. Barr, A., & Castleman, B. (2021). The bottom line on college advising: Large increases in degree attainment. EdWorking Papers, Brown University. https://www.edworkingpapers.com/ai21-481f	Interventions related to postsecondary completion
57. Patrick, K., Socol, A., & Morgan, I. (2020). Inequities in advanced coursework: What's driving them and what leaders can do. The Education Trust. https://edtrust.org/wp-content/uploads/2014/09/Inequities-in-Advanced-Coursework-Whats-Driving-Them-and-What-Leaders-Can-Do-January-2019.pdf 58. U.S. Department of Education (2023). A first look: Students' access to education opportunities in U.S. public schools. U.S. Department of Education Office for Civil Rights. https://www2.ed.gov/about/offices/list/ocr/docs/crdc-educational-opportunities-report.pdf?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=	Access to academic supports and experiences

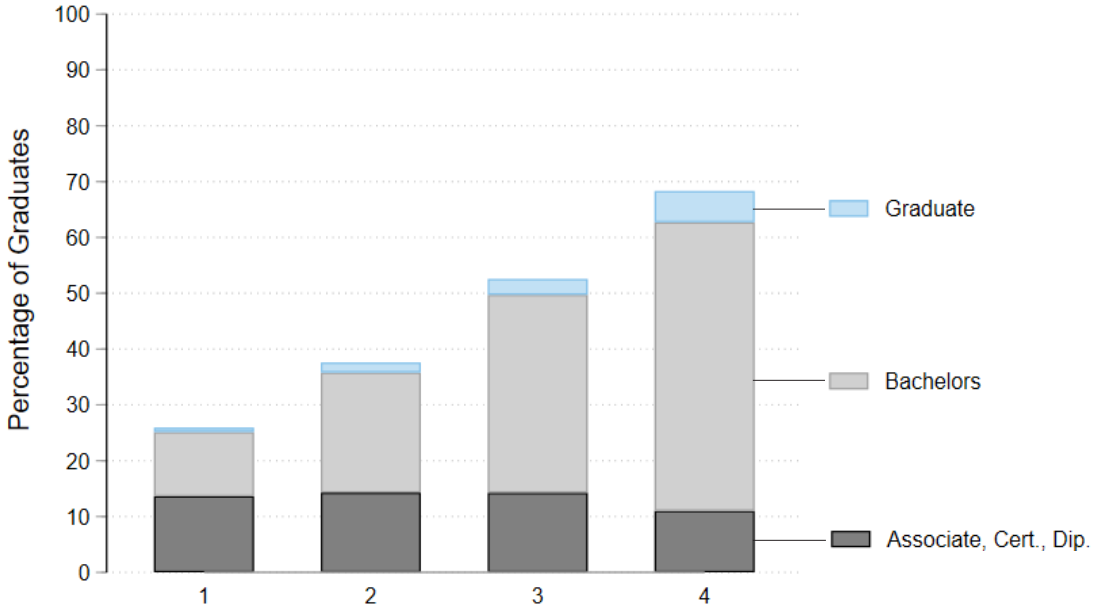
Table 4: Earnings by Demographic Characteristics, Degree, ELA Test Quartile, and Field of Study

		Adjusted Annual Wages			
		Non-STEM Degree		STEM Degree	
Demographic	Degree	Q1 & Q2	Q3 & Q4	Q1 & Q2	Q3 & Q4
Black	Certificate, Diploma, or Associates	33432	33449	41380	
	Bachelor's	44308	45286	54781	60547
Asian	Certificate, Diploma, or Associates	38203	40073	40270	38874
	Bachelor's	48337	55776	57716	70885
Hispanic	Certificate, Diploma, or Associates	36501	38733	45865	35986
	Bachelor's	40812	47299	46361	53275
White	Certificate, Diploma, or Associates	39436	39288	45693	48198
	Bachelor's	48471	50990	55863	62501
Two or More	Certificate, Diploma, or Associates	38286	36254		43303
	Bachelor's	45922	49502	43931	60059
Female	Certificate, Diploma, or Associates	33815	36133	37844	35971
	Bachelor's	45211	49429	43719	53957
Male	Certificate, Diploma, or Associates	33730	43105	46030	48265
	Bachelor's	48952	53631	61164	70849
Never FRPL	Certificate, Diploma, or Associates	39582	39751	45343	45874
	Bachelor's	49240	51994	56365	64794
Ever FRPL	Certificate, Diploma, or Associates	36985	37593	44164	45608
	Bachelor's	42720	47470	51615	57853

Sample includes the classes of 2013 and 2014 with 3 or more quarters of earnings data seven years from high school graduation. Empty cells represent groups where the n counts were not sufficient for reporting.

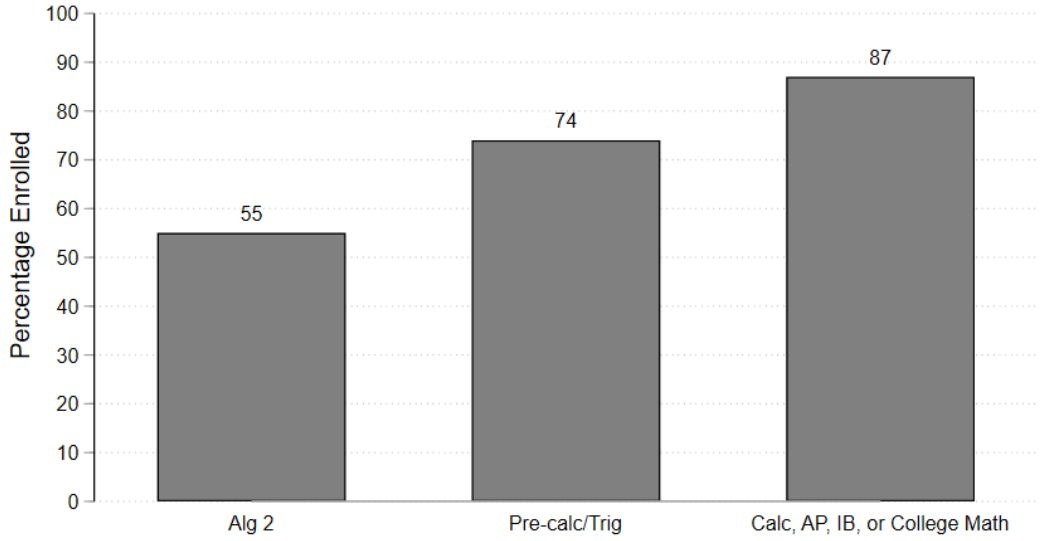
Supplemental Figures

A.1 Degree Attainment Seven Years from High School by Quartile of Geometry Achievement



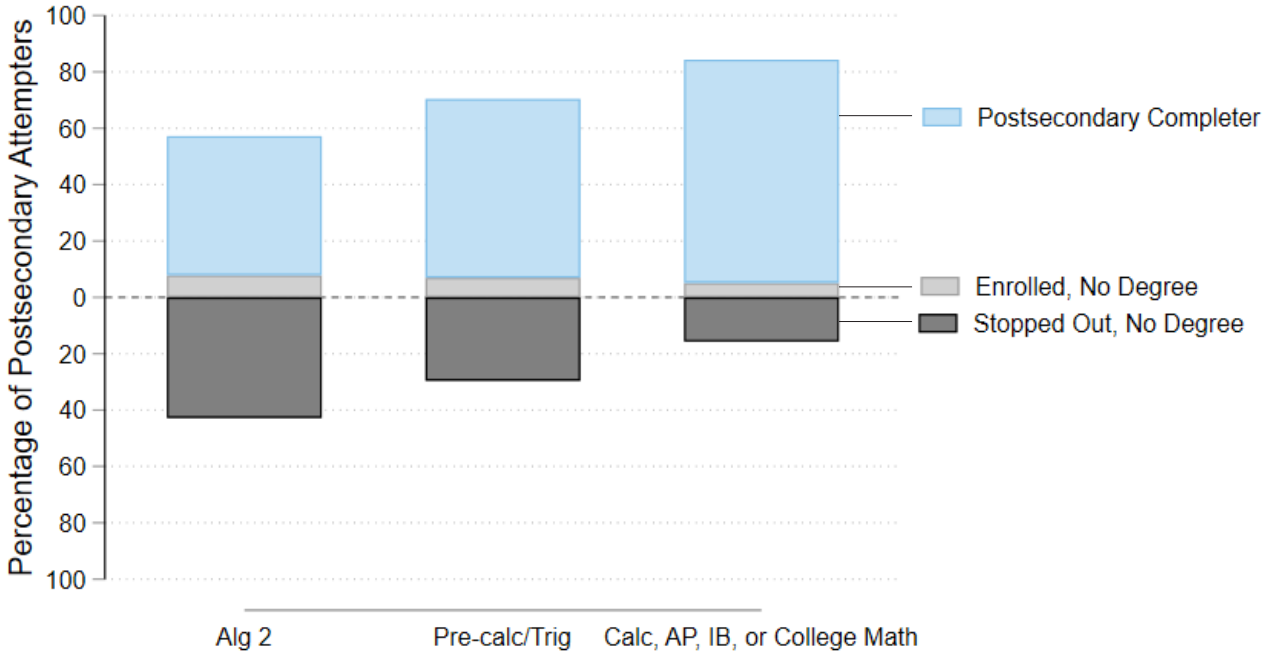
Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).
50% of observations missing Geometry scores, 66% missing Algebra I, 6% missing ELA.

A.2 Percentage Enrolled in College One Year After High School by Highest Math in High School



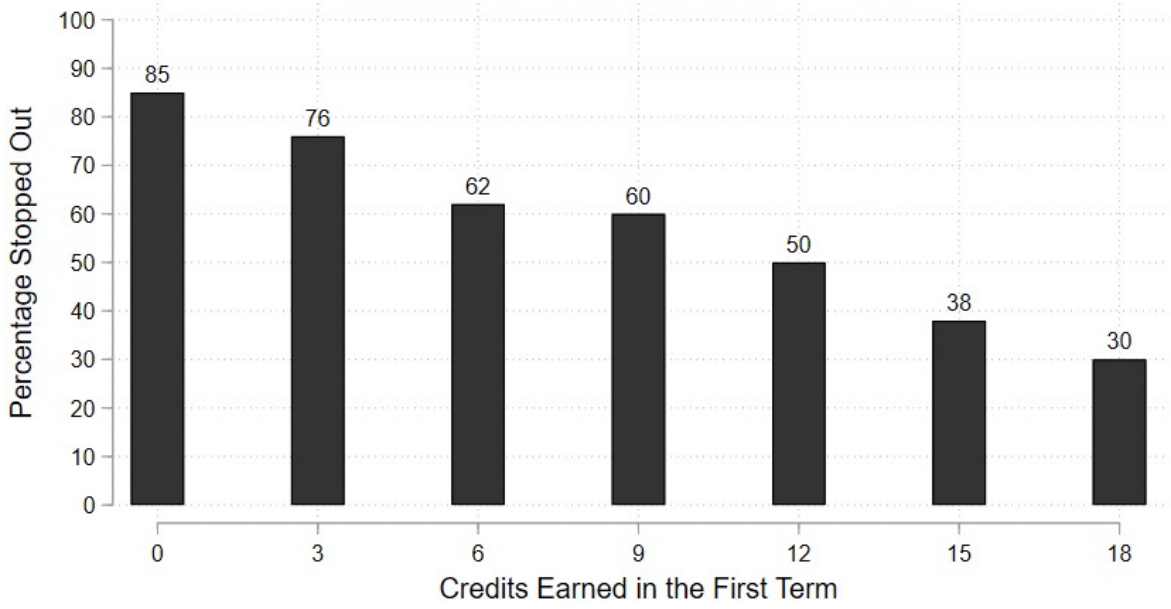
Sample includes the classes of 2013 and 2014 measured 6 years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Graph does not include those still enrolled at 2-year privates due to small cell counts.

A.3 Percentage of Postsecondary Attempters by Enrollment Status Six Years After College Entry by Highest Math in High School



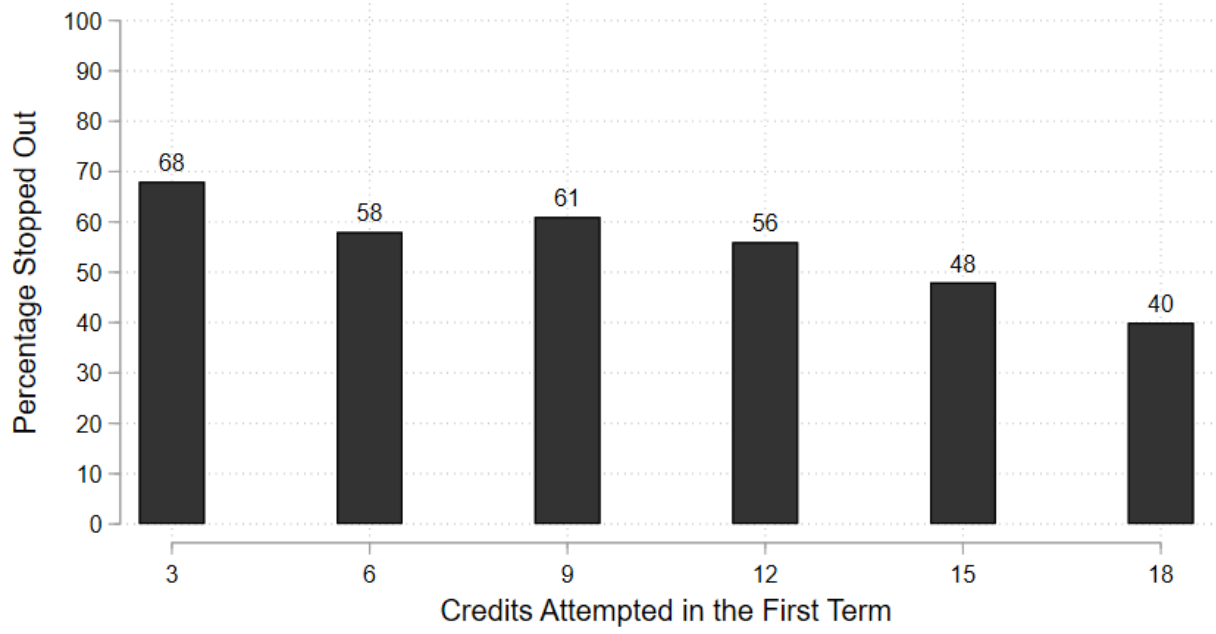
Credits earned in the first term are grouped into three-credit intervals, labeled by the maximum of the interval.
Sample includes classes of 2013 and 2014 who attended Washington public colleges measured within 3 years after college entry.
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.

A.4 Percentage of 2-Year College Enrollees Who Stopped Out by Number of Credits in the First Term



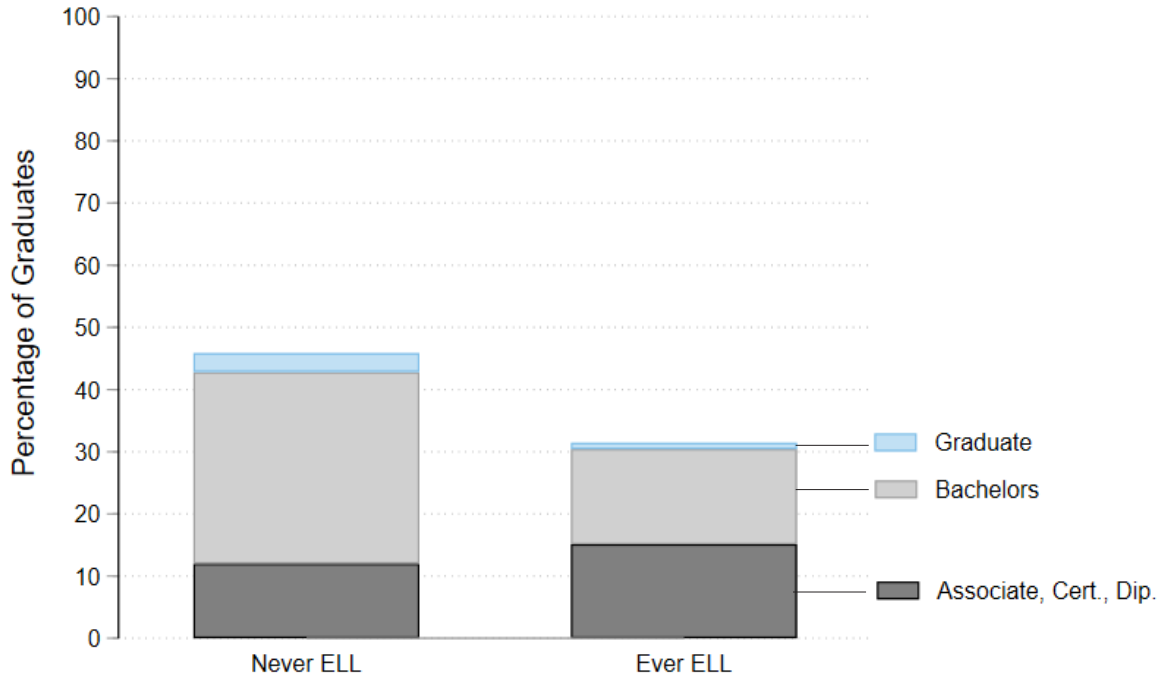
Credits earned in the first term are grouped into three-credit intervals, labeled by the maximum of the interval.
Sample includes classes of 2013 and 2014 who attended Washington public colleges measured within 3 years after college entry.
Stopout defined as students who have enrolled in at least one semester of college and have not completed a degree.
Institution taken from first term of enrollment.

A.5 Percentage of 2-Year College Enrollees Who Stopped Out by Number of Credits Attempted in the First Semester



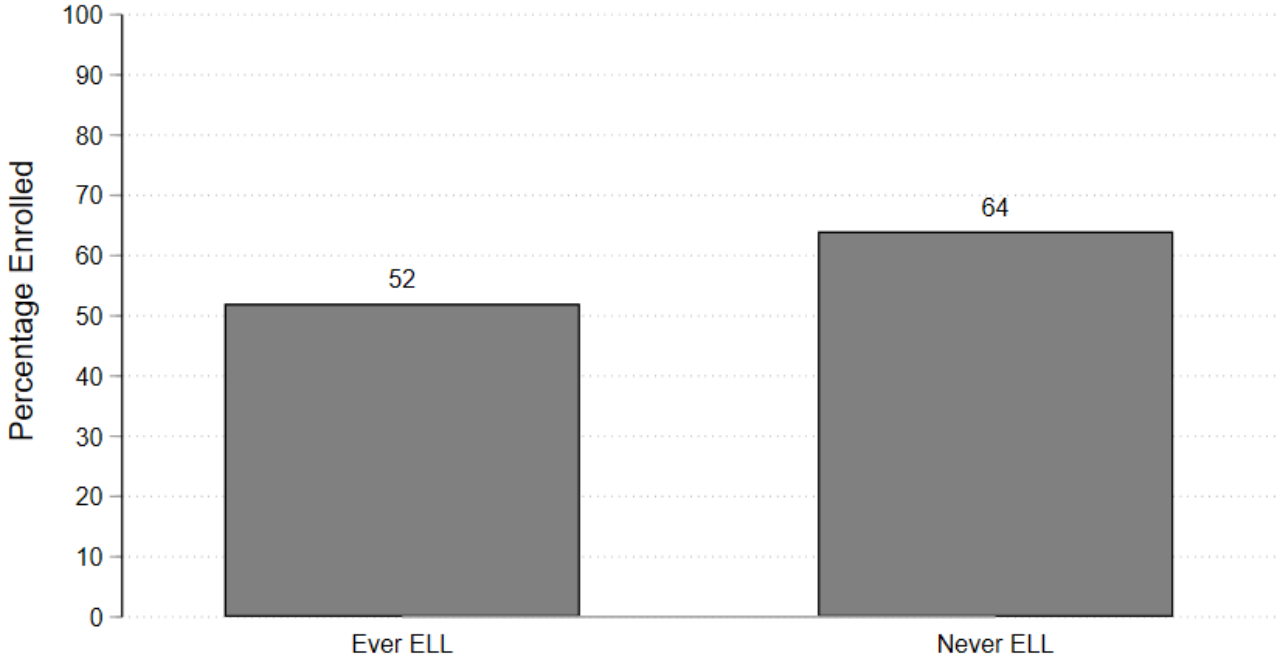
Credits earned in the first term are grouped into three-credit intervals, labeled by the maximum of the interval.
Sample includes classes of 2013 and 2014 who attended Washington public colleges measured within 6 years after college entry.
Stopout defined as students who have enrolled in at least one semester of college and have not completed a degree.
Institution taken from first term of enrollment.

A.6 Degree Attainment Seven Years from High School by ELL Status



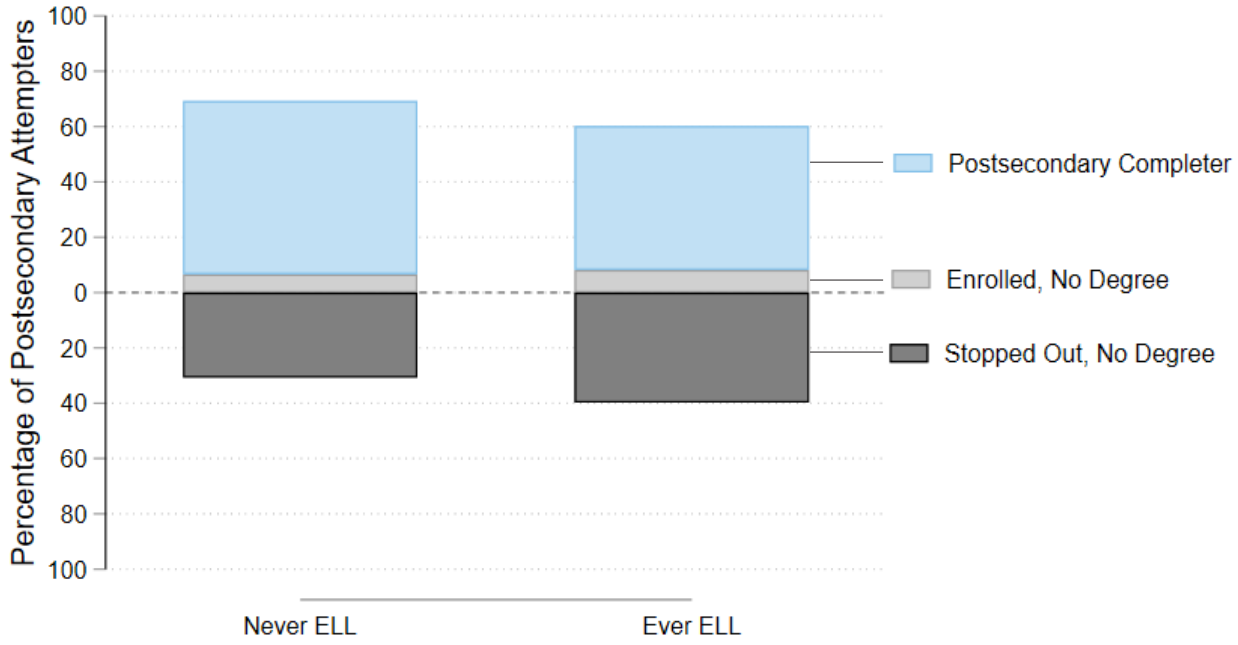
Sample includes classes of 2013 and 2014.

A.7 Percentage Enrolled in College One Year After High School by ELL Status



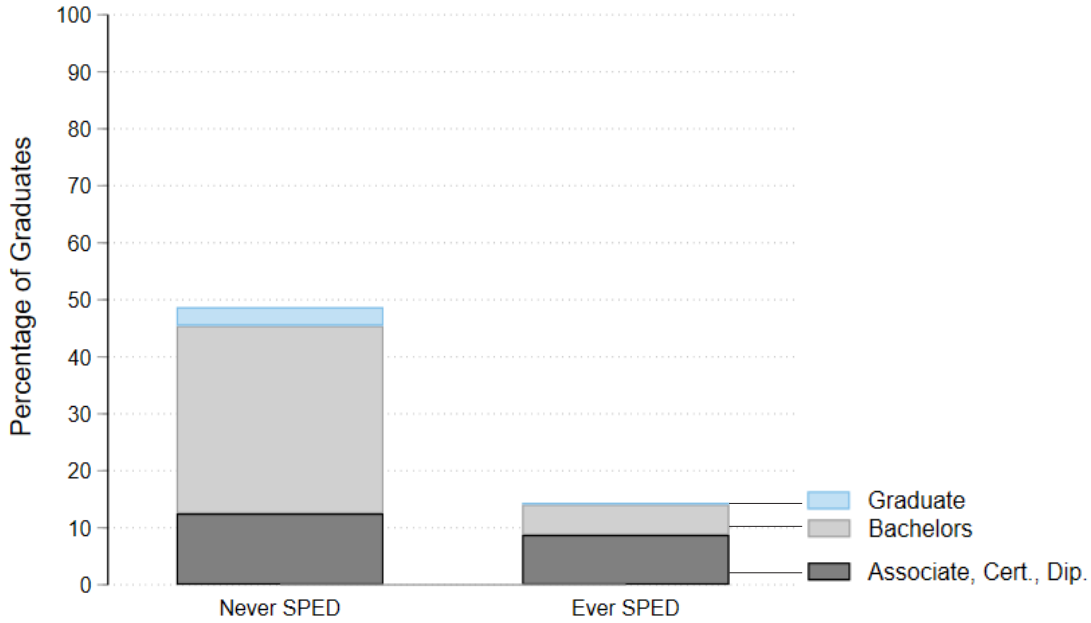
Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).

A.8 Percentage of Postsecondary Attempters by Enrollment Status Six Years After College Entry by ELL Status



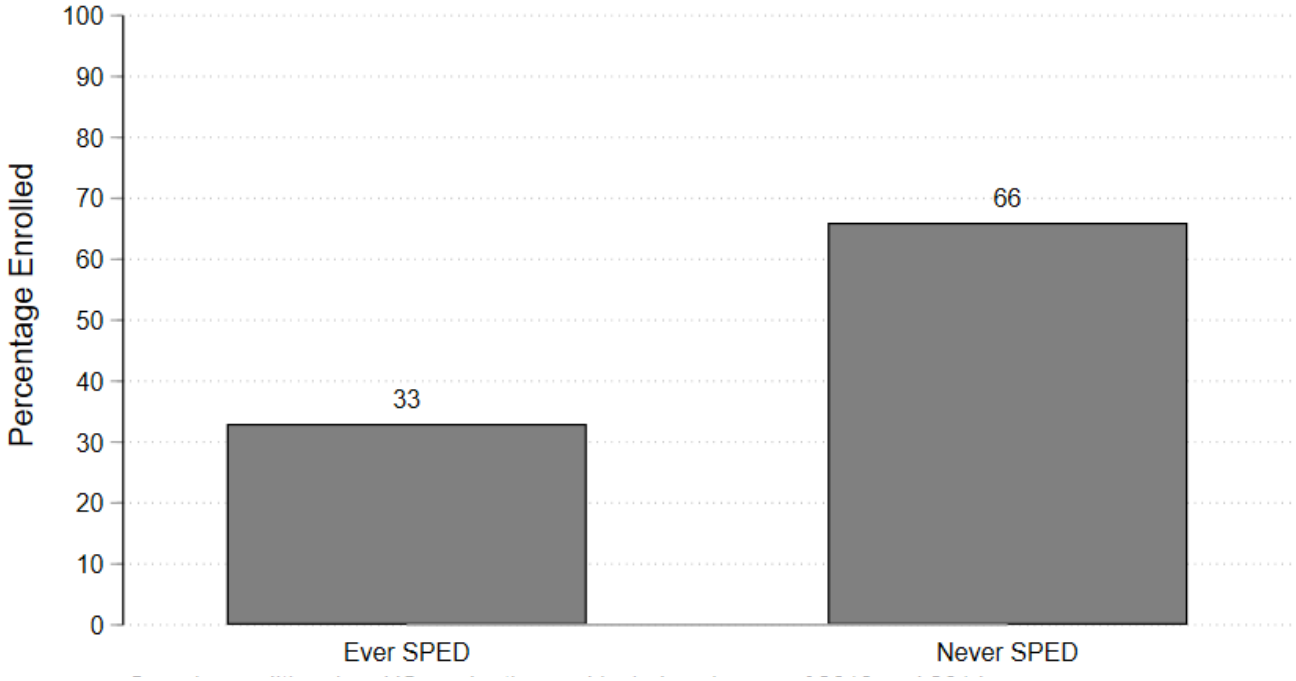
Sample conditional on high school graduation and includes classes of 2013 and 2014.
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Graph does not include those still enrolled at 2-year private institutions due to small cell counts.

A.9 Degree Attainment 7 Years from High School by SPED Status



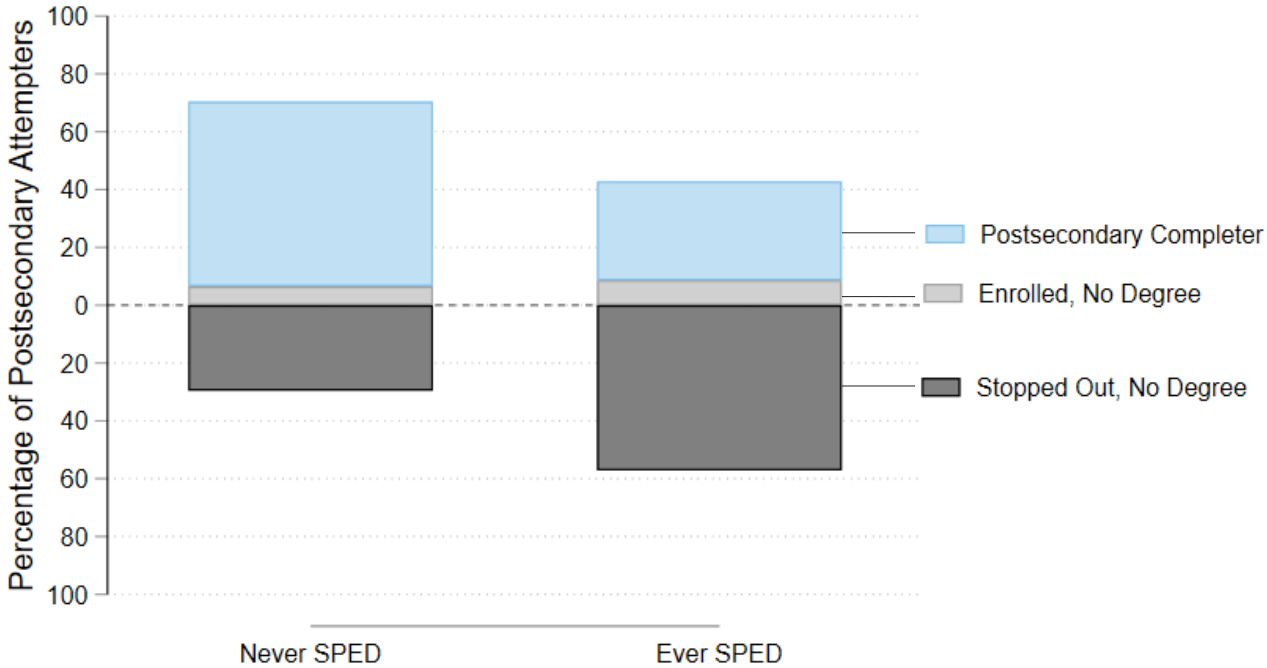
Sample includes the classes of 2013 and 2014.

A.10 Percentage Enrolled in College One Year After High School by SPED Status



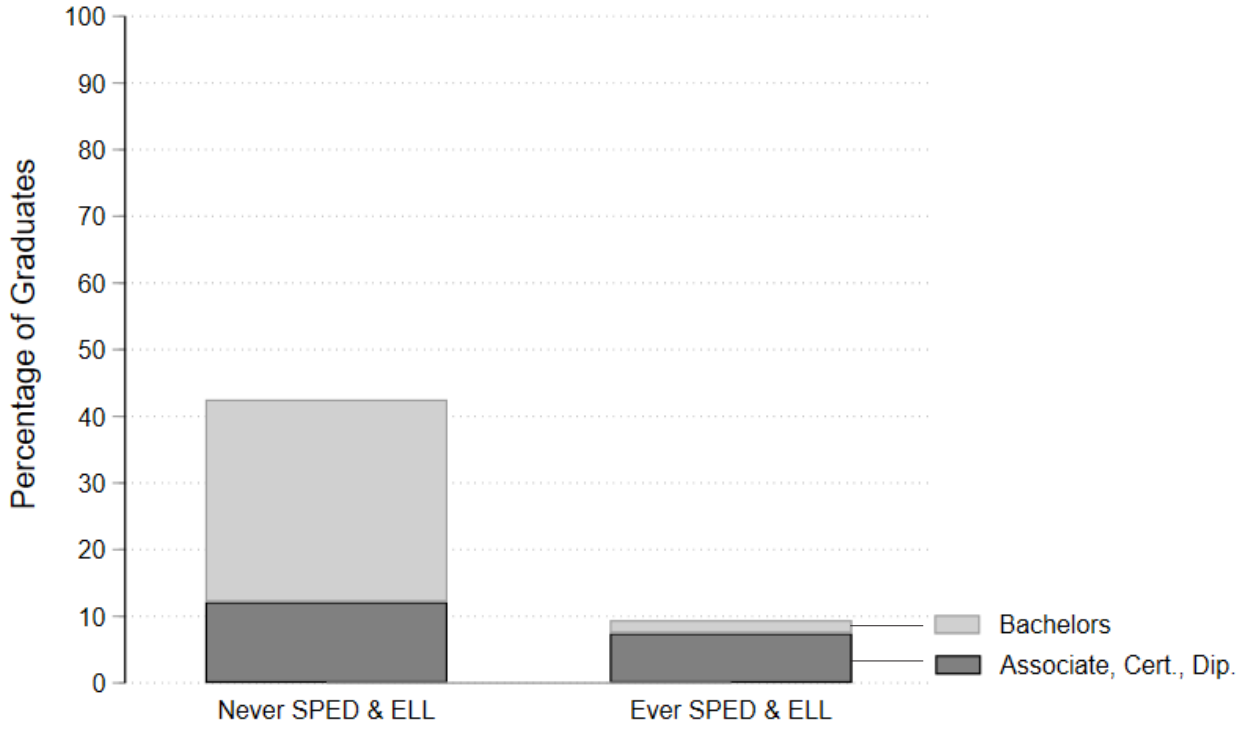
Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).

A.11 Percentage of Postsecondary Attempters by Enrollment Status 6 Years After College Entry by SPED Status



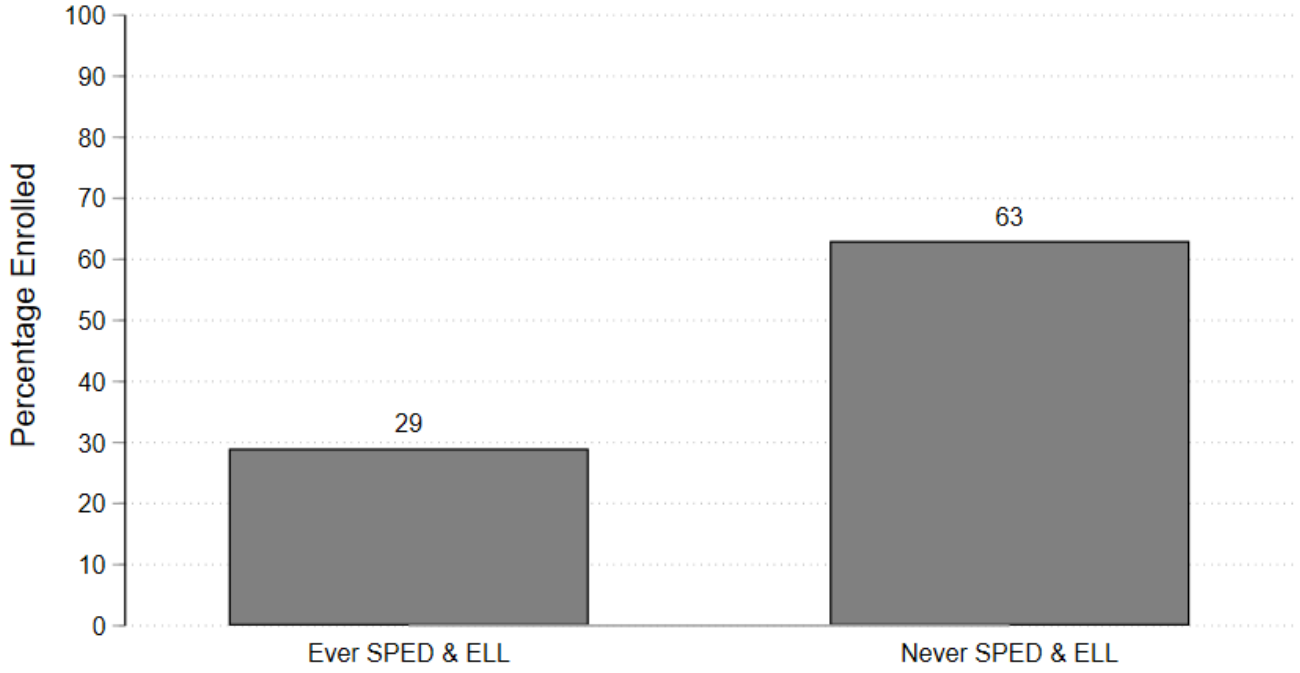
Sample includes classes of 2013 and 2014 measured 6 years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Graph does not include those still enrolled at 2-year private institutions due to small cell counts.

A.12 Degree Attainment 7 Years from High School by Combined SPED/ELL Status



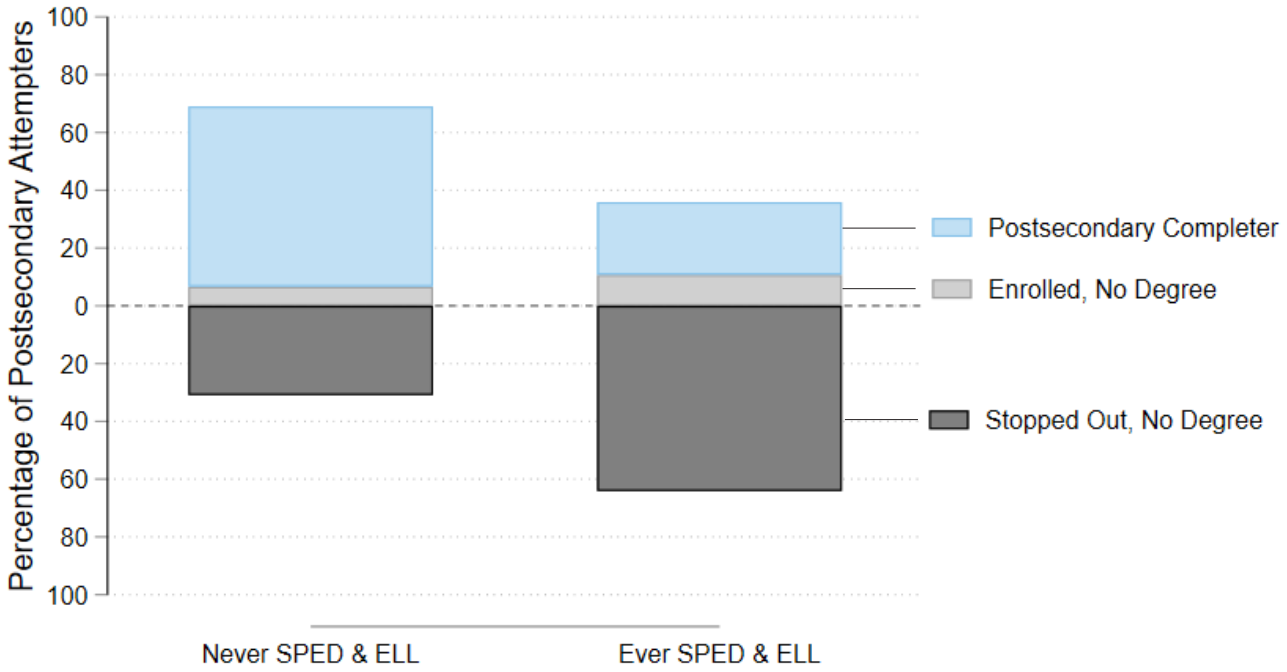
Sample includes classes of 2013 and 2014.

A.13 Percentage Enrolled in College One Year After High School by Combined SPED/ELL Status



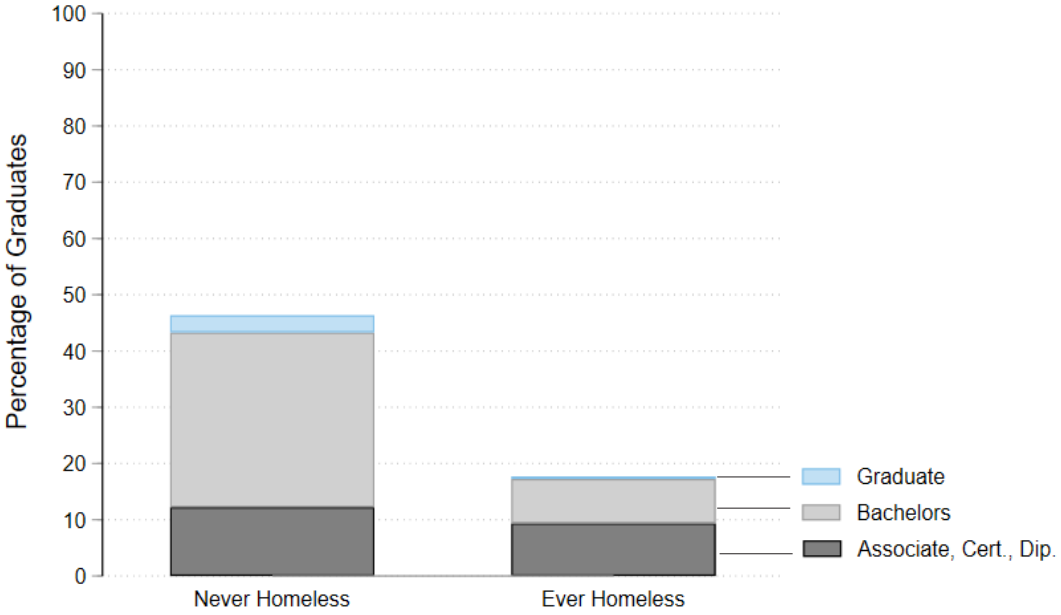
Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).

A.14 Percentage of Postsecondary Attempters by Enrollment Status 6 Years After College Entry by Combined SPED/ELL Status



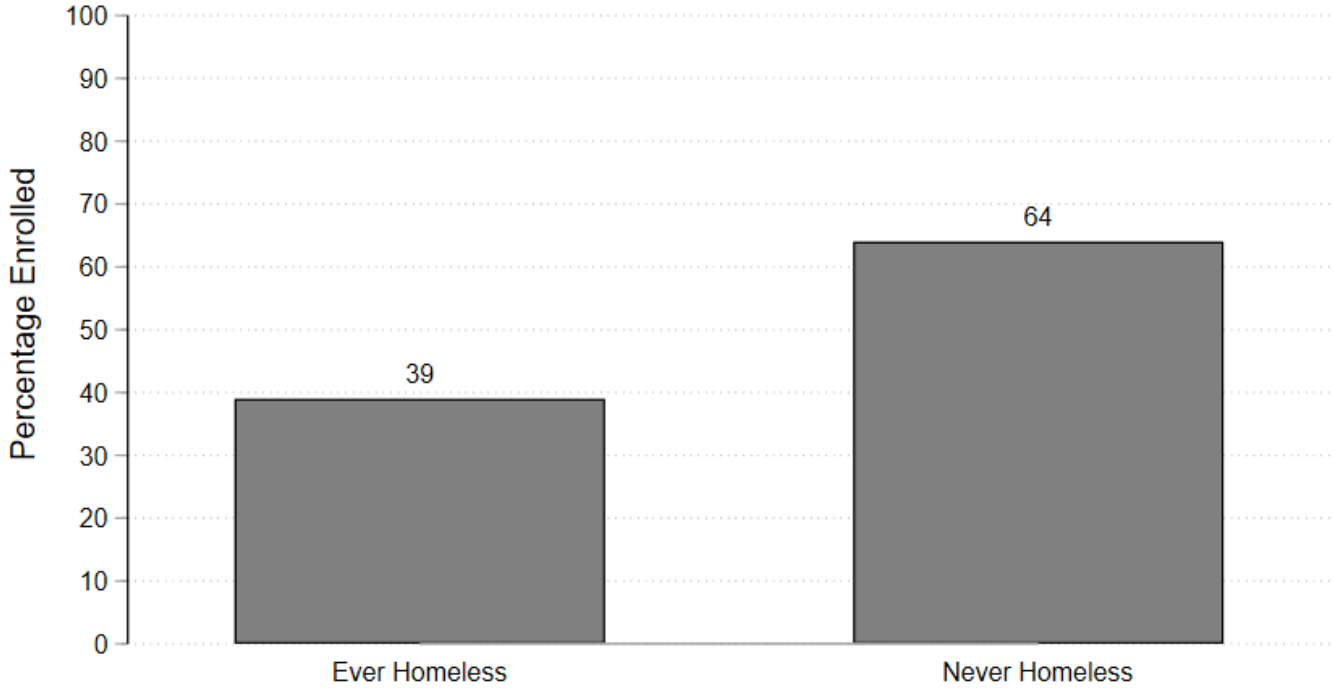
Sample includes classes of 2013 and 2014 measured 6 years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Graph does not include those still enrolled at 2-year private institutions due to small cell counts.

A.15 Degree Attainment from High School by Homeless Status



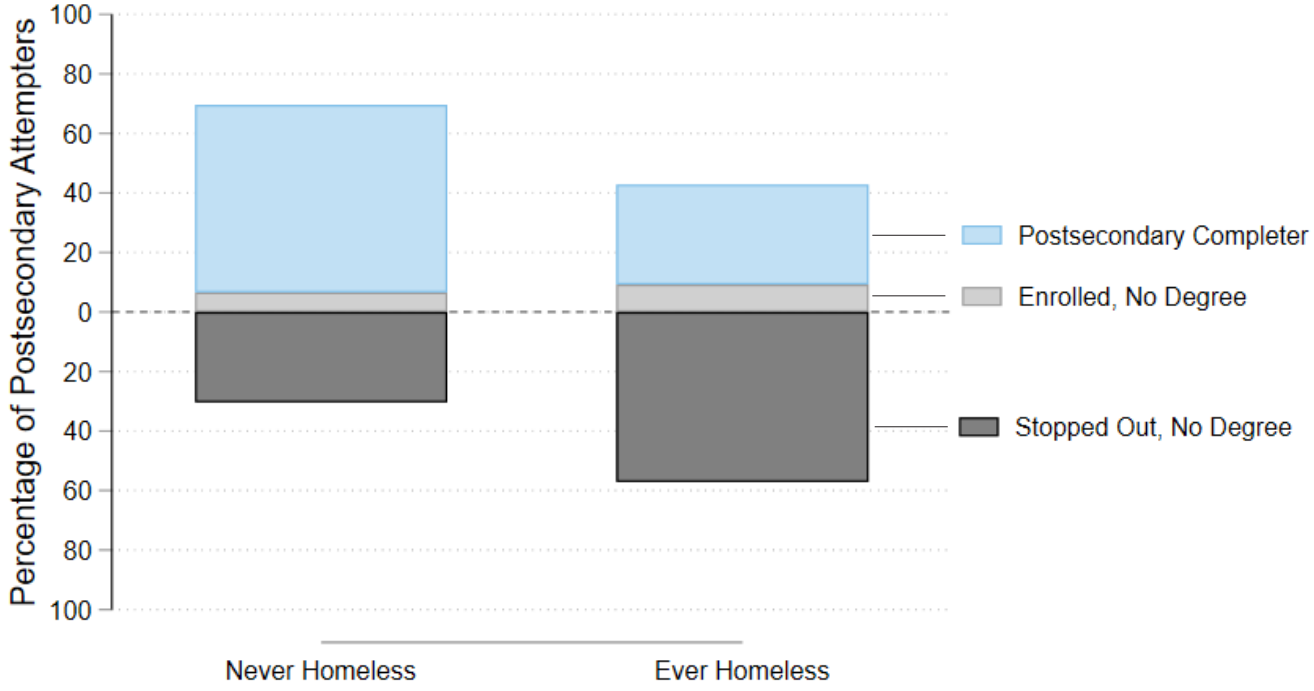
Sample includes classes of 2013 and 2014.

A.16 Percentage Enrolled in College One Year After High School by Homeless Status



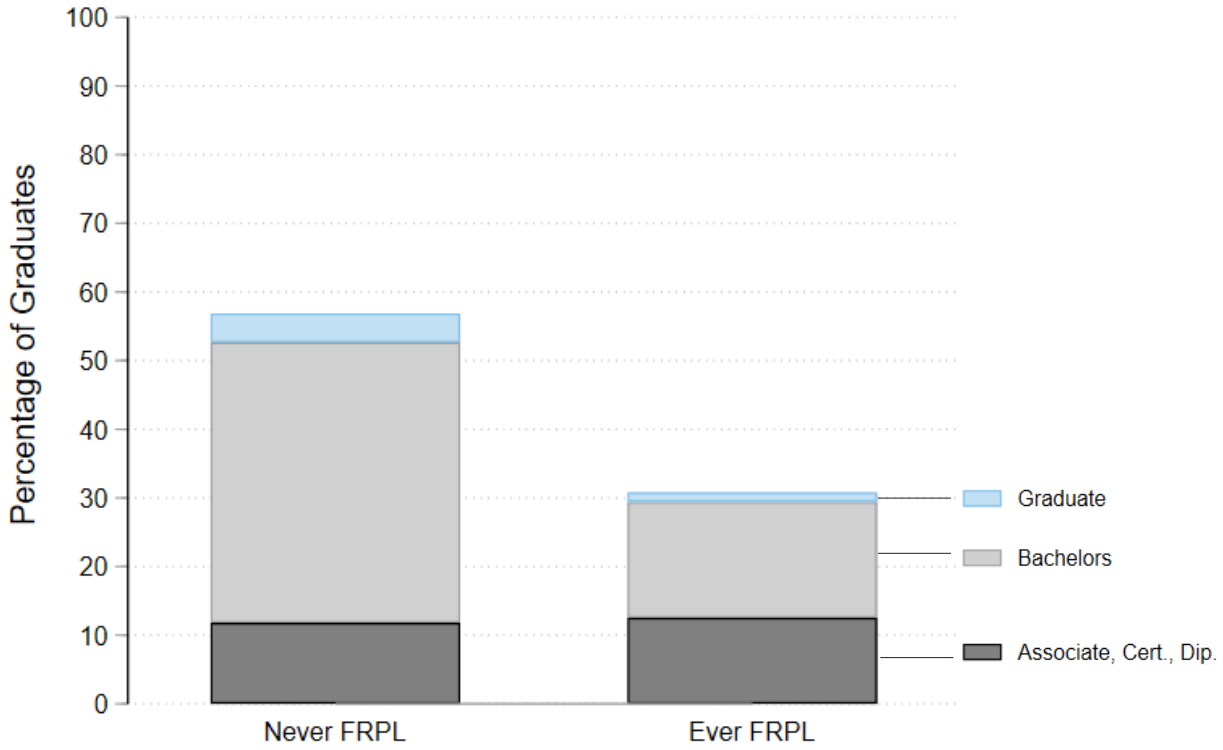
Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).

A.17 Percentage of Postsecondary Attempters by Enrollment Status 6 Years After College Entry by Homeless Status



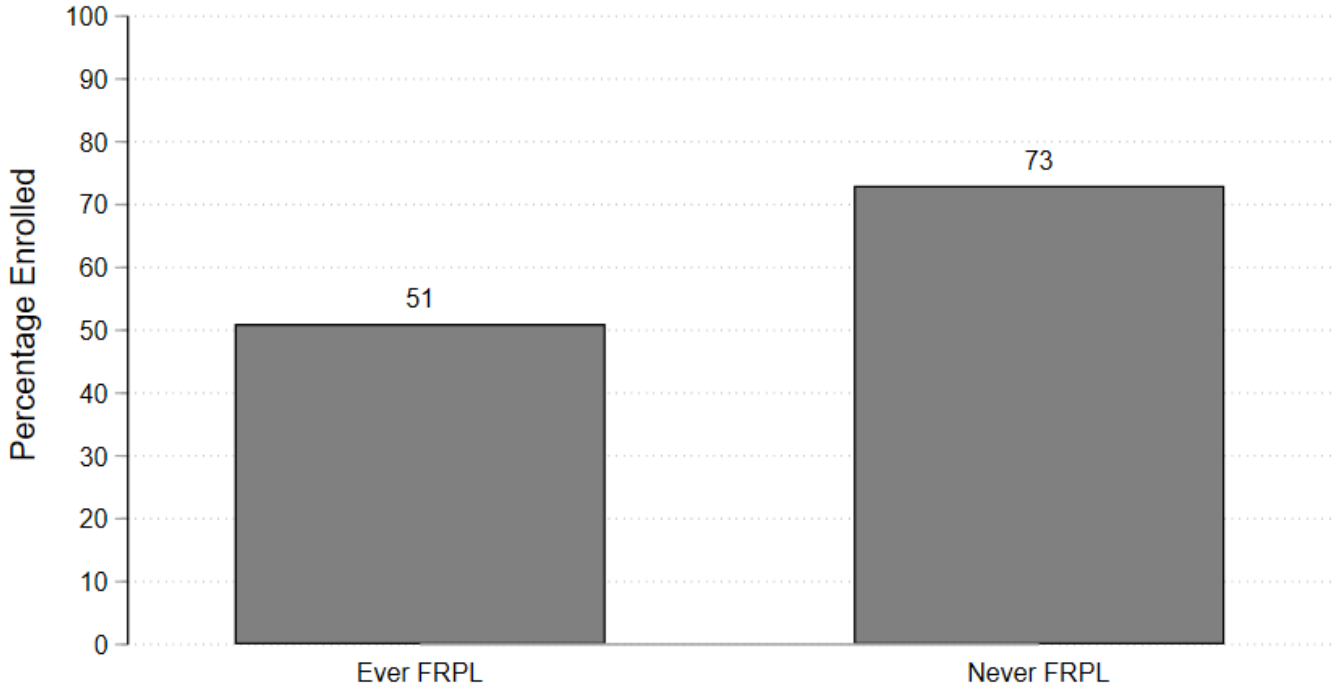
Sample includes classes of 2013 and 2014 measured 6 years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Graph does not include those still enrolled at 2-year private institutions due to small cell counts.

A.18 Degree Attainment 7 Years from High School by Free and Reduced Price Lunch Status



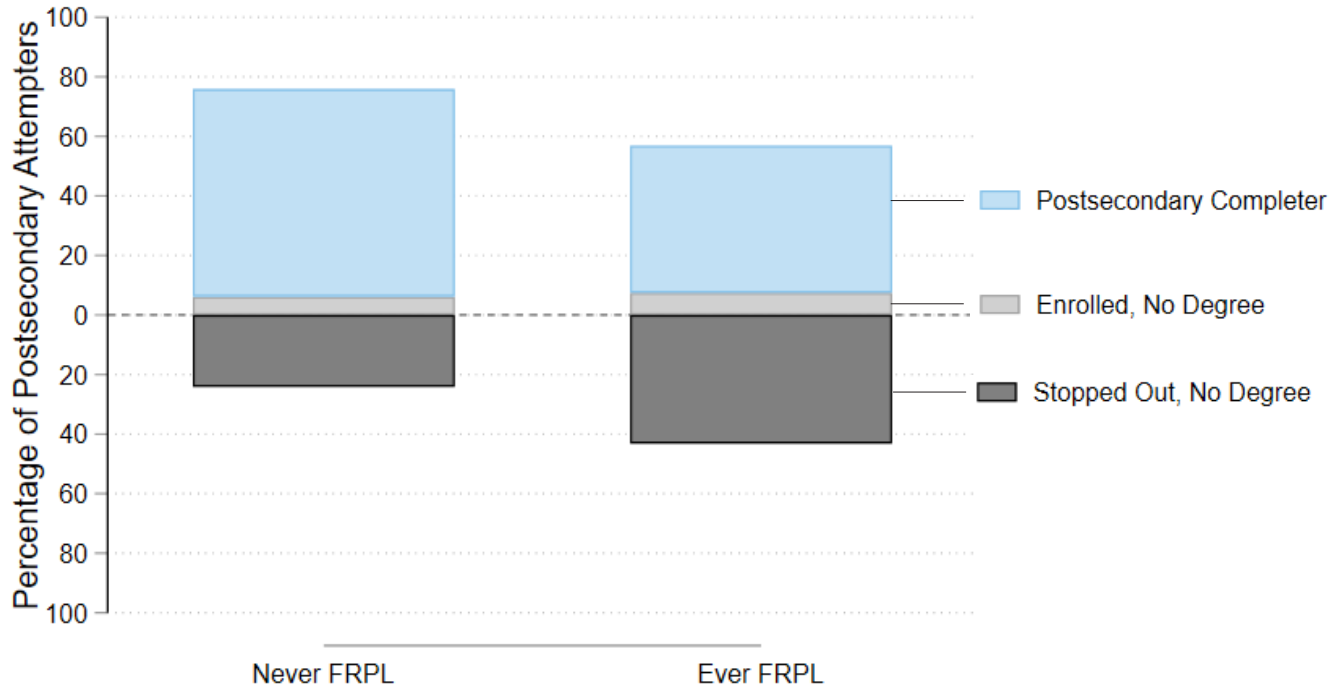
Sample includes classes of 2013 and 2014.

A.19 Percentage Enrolled in College One Year After High School by Free and Reduced Price Lunch Status



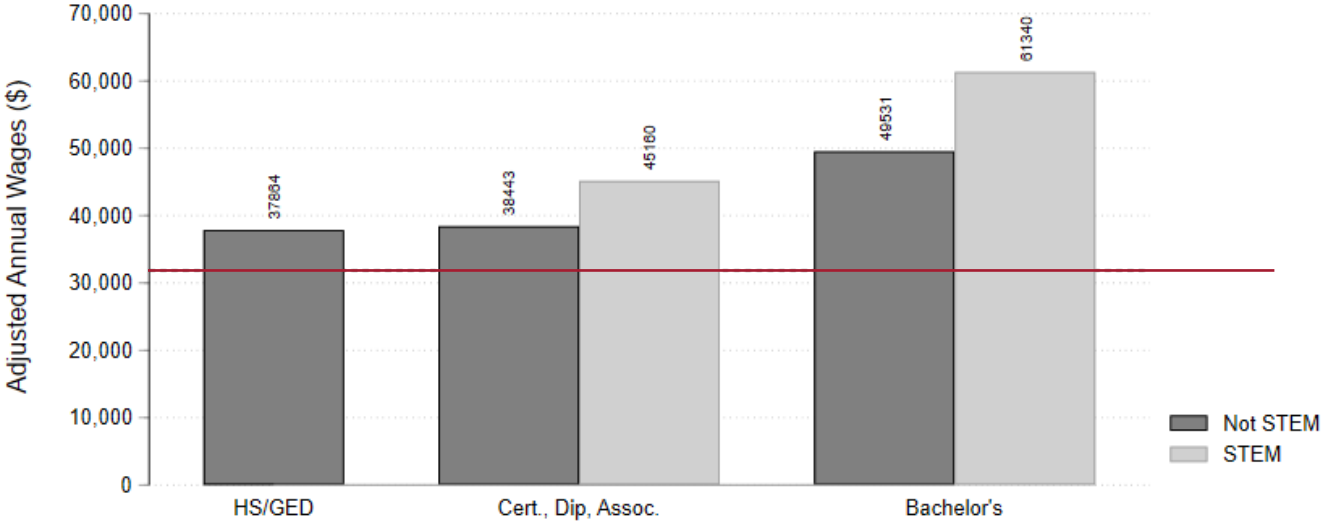
Sample conditional on high school graduation and includes classes of 2013 and 2014.
Demographic variables calculated based on whether student belongs to group in any observable year (9-12).

A.20 Percentage of Postsecondary Attempters by Enrollment Status 6 Years After College Entry by Free and Reduced Price Lunch Status



Sample includes classes of 2013 and 2014 measured 6 years after college entry (83% of attempters).
Stopout defined as students who have enrolled in at least one semester of college, have not completed a degree, and were not enrolled in the year measured.
Graph does not include those still enrolled at 2-year private institutions due to small cell counts.

A.21 Mean Wages by Highest Degree and STEM Field of Study 7 Years After High School Graduation Benchmarked Against the Living Wage Threshold



Wages adjusted to 2021 dollars. Wages for high school classes of 2013 and 2014.
Dotted line is the average living wage between 2020 and 2021 adjusted to 2021.
Living wage estimates from the MIT Living Wage Calculator.
Sample comprises all individuals with 3 or 4 wage quarters observed in the 7th year after high school graduation.
Missing quarter imputed for individuals with only three wage quarters observed.
Wages winsorized at the top and bottom 1st percentiles.

STRATEGIC DATA PROJECT

Center for Education Policy Research

HARVARD UNIVERSITY