Texas College, Career, and Military Readiness Indicator Study: Examining Credit Accumulation

White Paper

Kristina L. Zeiser, Molly Cain, Justin Luu, and Maria Dracopoli

September 2025

American Institutes for Research® | AIR.ORG

AIR®
Advancing Evidence.
Improving Lives.

Contents

Exhibits

Executive Summary

Study Description

In 2023, the Texas legislature appropriated funds for the Texas Education Agency (TEA) to investigate the college, career, and military readiness (CCMR) indicators and their relationships with longer term postgraduation outcomes, including students' college credit accumulation and college degree completion. TEA contracted with the American Institutes for Research® (AIR®) to examine relationships between CCMR indicators and postsecondary education outcomes and to explore student experiences during college that are predictive of successful degree completion.

Using data from the Education Research Center at the University of Texas at Austin, AIR researchers calculated degree completion rates within 100% of normative time to completion (4 years for bachelor's degrees, 2 years for associate degrees) and within 150% of normative time to completion (6 years for bachelor's degrees and 3 years for associate degrees). We examined bachelor's degree completion rates among the 158,845 graduates in 2017–18 who enrolled in a public community college or university in 2018–19, and we examined associate degree completion rates among the 84,958 graduates in 2017–18 who enrolled in a public community college in 2018–19. To identify a benchmark of credit accumulation that is predictive of successful degree completion, we focused on students who completed bachelor's and associate degrees within 100% of normative time to completion and calculated the average number of non-developmental college credits earned per semester they were enrolled in college. Finally, we explored relationships between degree completion rates and student experiences during college including developmental course-taking in the first year of college, first-year grade point average (GPA), starting at a community college (for bachelor's degree completion only), working, enrolling part time, taking summer courses, and taking a semester off.

Results

- **Among students who completed associate and bachelor's degrees within 100% of normative time, the average number of credits earned per enrolled semester was less than the expected 15 college credits.**
  - On average, students who completed a bachelor's degree within 4 years of beginning college enrolled in 7.4 semesters and earned an average of 14.7 credits per enrolled semester. Additionally, students who completed an associate degree within 2 years enrolled for an average of 3.7 semesters and earned an average of 14.3 credits per

enrolled semester. These findings suggest that many college enrollees earned college credits during high school that they were able to apply to their college degrees, allowing them to complete college degrees more quickly and with a reduced course load.

  - For bachelor's degree completion, the college readiness CCMR indicators (i.e., TSI, dual credit, AP/IB, associate degree, and OnRamps) were associated with earning fewer credits per semester (ranging from 13.7 credits to 14.7 credits per enrolled semester) than the averages for the career readiness indicators and for students who did not complete CCMR indicators (more than 15 credits per enrolled semester).
  - For associate degree completion, the average number of credits earned per enrolled semester ranged from 13.1 credits for students who completed dual credit to 14.3 credits for students who completed an aligned industry-based credential. Students who did not complete a CCMR indicator in high school earned the highest average number of credits per enrolled semester (15.7), suggesting that completing a CCMR indicator may be associated with a reduced academic load while pursuing a 2-year associate degree.

- **Although the relationship between part-time enrollment status and degree completion was similar across degree types, the relationship between employment status and degree completion differed by degree type.**
  - Students who were enrolled part time for zero semesters were more likely to complete a bachelor's degree within 6 years (56%) or an associate degree within 3 years (17%) than students who were enrolled part time for most of their enrolled semesters (3% for bachelor's degree completion and 4% for associate degree completion).
  - For bachelor's degree completion, students who were employed for all of the semesters that they were enrolled in college had the lowest bachelor's degree completion rate within 6 years of college entry (18%), whereas students who were employed for fewer than half of their enrolled semesters had the highest bachelor's degree completion rate (55%).
  - For associate degree completion, students who were not employed during college had the highest associated degree completion rate within 3 years of college entry (15%). Across the remaining employment categories, associate degree completion rates were similar, with about 10% of students who worked between one and all enrolled semesters completing their associate degree within 3 years of initial college enrollment.
- Relationships between college experiences and degree completion rates differed by degree type. Many experiences were more predictive of bachelor's degree completion than associate degree completion.

- The strongest predictor of bachelor's degree completion was meeting credit accumulation benchmarks, on average, across enrolled semesters. Ninety-two percent of students who accumulated at least 14.7 credits per enrolled semester completed a bachelor's degree within 6 years compared with 28% of students who did not meet this credit accumulation benchmark.
- Other predictors of bachelor's degree completion within 6 years of college entry include first-year GPA (13% of students whose first-year GPA was below 2.5 compared with 56% of students whose first-year GPA was 2.5 or higher), developmental course-taking (14% of students who took a developmental course in the first year of college compared with 47% of students who did not), starting at a community college (14% of students who started at a community college compared with 64% of students who started at a university), summer course-taking (12% of students who did not take a summer course compared with 53% of students who did take a summer course), and taking a semester off (11% of students who took a semester off compared with 50% of students who did not take a semester off).
- The predictors of degree completion were more weakly related to associate degree completion. Although meeting the credit accumulation benchmark and having a first-year GPA of 2.5 or higher were the strongest predictors of associate degree completion, only about 18% of community college enrollees who met these criteria completed an associate degree within 3 years.

Policy Implications

Students' completion of college credits during high school relates to higher rates of degree completion, more timely degree completion, and a more manageable workload during college. The credit accumulation benchmarks identified in this study revealed that, on average, students who completed college degrees within 100% of normative time to completion earned fewer than the anticipated 15 credits per semester. This finding highlights the fact that the vast majority of students who completed a college degree in Texas within 100% of normative time to completion were students who completed CCMR indicators, and particularly those that allow students to earn college credits during high school. These findings support state policies related to affordable dual credit opportunities and college and career readiness school models in Texas that have the potential to increase students' likelihood of degree completion after high school by providing opportunities to earn transferrable college credits during high school.

Academic preparation during high school alone is not sufficient to ensure timely degree completion. Although students who completed college readiness indicators during high school had higher rates of degree completion, across the indicators, between 81% and 86% of students who enrolled in community colleges did not complete an associate degree within

3 years of initial college enrollment, and between 27% and 48% of college enrollees did not complete a bachelor's degree within 6 years of initial college enrollment. Given that many postsecondary interventions target students who struggle academically, higher-achieving students may not be receiving the support that they need to persist and succeed in college. To increase completion rates, colleges may want to identify and resolve barriers to completion among higher-achieving students (for example, financial barriers, advising).

It is difficult to identify strong predictors of associate degree completion. Although many of the college experiences examined in this study were predictive of bachelor's degree completion, relationships between college experiences and associate degree completion were weaker. One potential explanation for this is that not every student who enrolls in community college intends to complete an associate degree. Some students may seek other credentials or certificates, and some students may hope to earn college credits that count toward a bachelor's degree after transferring to a university. It would be helpful for community colleges to identify and track students' degree intentions to ensure that those who wish to complete an associate degree are given the advising and support that they need to achieve their goals.

A. Introduction

In 2018, the Texas Education Agency (TEA), together with the Texas Higher Education Coordinating Board (THECB), established the goal that 60% of Texans ages 25–34 will have earned a postsecondary credential by 2030, also known as "60x30TX" (TEA, 2018). However, a recent study that followed 2017–18 Texas high school graduates found that while almost half enrolled in college within a year of high school graduation, only 29% completed a college degree or certificate within 6 years of high school graduation (Zeiser & Cain, 2025). This study also found that students who completed state-identified indicators of college, career, and military readiness (CCMR) during high school were more likely to enroll in college and complete college degrees and certificates within 6 years, compared with students who did not complete CCMR indicators.

To better understand how CCMR indicators influence college degree completion, the American Institutes for Research® (AIR®), a non-profit, non-partisan social science research organization, explored the extent to which the completion of CCMR indicators during high school related to the number of semesters students enrolled in college and the average number of credits accumulated per enrolled semester for up to 6 years after initial college enrollment. [1] The study also explored the extent to which other college experiences—such as grade point average (GPA) during the first year of college, taking developmental and summer courses, changes in enrollment status, and working during college—were predictive of college degree completion.

B. Background

The state of Texas sought to identify a set of student outcomes during high school that is predictive of student success in college and/or career after high school. The CCMR indicators established in the Texas Education Code, Section 39.053(b), are intended to measure high school graduates' preparedness for college, the workforce, or the military. These indicators are used in the state's A–F Accountability System and relate to the calculation of outcomes bonus funding for districts.

As of January 1, 2024, the Texas Education Code includes 10 CCMR indicators. Of the 10 indicators, six measure college readiness, three measure career readiness, and one measures

[1] Initial college enrollment refers to college enrollment after high school graduation and does not include college courses completed during high school.

military readiness. Two of the 10 indicators (one college-ready indicator and one career-ready indicator) apply only to students who receive special education services. Exhibit 1 lists each category of readiness standard and its indicators, as identified in the accountability system (Texas Education Agency, 2024).

Although there are 10 readiness indicators, students can achieve some of the indicators in multiple ways. For example, a student can meet the Texas Success Initiative (TSI) indicator by achieving a minimum score in English language arts reading and mathematics on the TSI assessment. Alternatively, a student may qualify for a TSI exemption by meeting college readiness benchmarks on another measure, such as the SAT, the ACT, or State of Texas Assessments of Academic Readiness (STAAR) English III or Algebra II exams, or by completing a high school college preparatory course.

Exhibit 1. College, Career, and Military Readiness (CCMR) standards and indicators in the Texas A–F Accountability System for districts and high schools

Readiness standard	Indicator abbreviation	CCMR indicator
College ready	AP/IB	Earn a score of at least 3 on Advanced Placement (AP) or 4 on International Baccalaureate (IB)) examinations.
	TSI	Meet Texas Success Initiative (TSI) criteria (SAT/ACT/TSI assessment/college preparatory course) in English language arts reading and mathematics.
	Dual credit	Earn dual credit (9 hours or more in any subject, or 3 hours or more in English language arts or mathematics).
	Associate degree	Earn an associate degree.
	OnRamps	Complete an OnRamps course in any subject and be eligible to earn college credit.
	Advanced diploma	Graduate under an advanced diploma plan and be identified as a student receiving special education services.
Career ready	Align IBC	Complete a program of study and earn an aligned industry-based certification (IBC).
	Certificate	Earn a Level 1 or Level 2 certificate.
	Workforce readiness	Graduate with a completed individualized education program and workforce readiness indicator (graduation type codes 04, 05, 54, or 55) and be identified as a student in special education.
Military ready	Enlisted	Enlist in the Armed Forces or the Texas National Guard.

Notes. The industry-based certification (IBC) indicator refers to the aligned IBC and a program-of-study completer that will be phased in with the class of 2026. The advanced diploma and workforce readiness indicators are specific to students receiving special education services. The military-ready indicator was excluded from this analysis because accountability calculations will not be conducted until data can be obtained directly from the U.S. Armed Forces.

In theory, completion of the CCMR indicators in high school—and specifically the college readiness indicators—should be related to higher rates of college degree completion because it reflects students' readiness for the academic rigor of college-level coursework. Supporting this theory, research has identified a variety of high school and college experiences and outcomes that are predictive of students' successful college degree completion, including GPA in both high school and college, standardized test scores, college credit accumulation, completing courses over the summer, working during college, enrollment status (for example, full time), expected family contribution toward tuition, and receipt of financial aid (Attewell & Jang, 2013; Davis, 2025; Demeter et al., 2022).

Among these predictors of successful degree completion, perhaps the most salient is credit accumulation, as students must earn a specified number of college credits to complete a college degree (60 credits for an associate degree and 120 credits for a bachelor's degree) and many of the other predictors are associated with credit accumulation. For example, students who successfully complete college courses during high school (such as students who complete the dual credit or associate degree CCMR indicators) and students who successfully complete rigorous examinations (such as students who complete the Advanced Placement [AP] or TSI assessment CCMR indicators) may be expected to continue excelling in college courses after high school. For this reason, one may expect CCMR indicators to be positively associated with college credit accumulation after high school.[2] In addition, students who enroll in college as full-time students (in other words, they attempt at least 12 college credits during the semester) and students who do not work while attending college may be expected to earn more college credits than part-time students and students who work.

However, student experiences during college may also relate to degree completion outcomes outside of credit accumulation. For example, many students must work during college to afford tuition, which may mean that employment during college positively relates to degree completion by increasing the affordability of college. In addition, higher GPAs during the first year of college may reflect greater student engagement, motivation, study skills, or work ethic, which may be predictive of continued enrollment and effort in future years. Some scholarships and financial aid arrangements also have GPA requirements, which means that achieving a higher GPA may influence degree completion through its impact on college affordability as well. To gain a better understanding of the predictors of successful degree completion in Texas, this study explored relationships between college degree completion rates and CCMR indicators, credit accumulation, and other student experiences during college.

[2] Alternatively, students who earn more college credits during high school, either through dual credit or through AP exams, may actually accrue *fewer* credits per semester after high school on average, as credits earned during high school may count toward degree requirements.

C. Study Overview and Research Questions

To understand the ways in which college credit accumulation may vary based on CCMR indicators and experiences during college, and to identify additional college experiences that predict successful degree completion, this study was guided by the following research questions (RQs):

1. What is a reasonable expectation in terms of accumulating college credits for high school graduates directly entering college, and how are CCMR indicators associated with credit accumulation?
2. How might expectations differ on the basis of enrollment status (part time versus full time) and whether students are also engaged in the workforce?
3. Should additional criteria be used in conjunction with a credit accumulation benchmark to predict successful degree completion?

To address these research questions, AIR analyzed linked, longitudinal data files from the Education Research Center (ERC) at the University of Texas at Austin. These data include information about students' academic performance during high school, enrollment in Texas colleges after high school, and employment and earnings information from the Texas Unemployment Insurance (UI) data system. Additional information about ERC data and the measures included in this study is provided in Appendix A.

The primary outcomes in this study are completion of a bachelor's degree and completion of an associate degree.[3] For each of these degree types, we report two measures of degree completion: successful completion within 100% of the normative time to completion (2 years for an associate degree and 4 years for a bachelor's degree) and successful completion within 150% of the normative time to completion (3 years for an associate degree and 5 or 6 years for a bachelor's degree). Measuring degree completion at 100% and 150% of normative time to completion allowed the research team to explore factors influencing time to degree completion and replicated how these measures are commonly used by colleges and states for accountability purposes.

In this paper, we focus on a subset of 158,845 high school graduates from 2017–18 who enrolled in a Texas community college or Texas public university in 2018–19, the first school

[3] Although THECB also considers transfer to a university as a successful outcome for accountability purposes, this paper does not examine transfer as a unique outcome. However, this paper explores bachelor's degree completion rates among students who begin college at a community college.

year after high school graduation (referred to as college enrollees).[4] Analyses that examined bachelor's degree and associate degree completion outcomes used different samples of college enrollees, classified based on the highest degree that they completed within the first 6 years after initial college enrollment.

To determine credit accumulation benchmarks that were predictive of successful completion of a bachelor's degree within 100% of normative time to completion, we limited the sample to students who (a) enrolled in any Texas community college or public university in 2018–19, and (b) completed a bachelor's degree within 4 years of initial college enrollment. To determine credit accumulation benchmarks that were predictive of successful completion of an associate degree within 100% of normative time to completion, we limited our sample to students who (a) enrolled in a community college in 2018–19, (b) did not complete an associate degree during high school,[5] and (c) completed an associate degree within 2 years of initial college enrollment. For degree completion outcomes measured within 150% of normative time to completion, we extended the sample to include students who completed a bachelor's degree within 6 years of initial college enrollment, and those who completed an associate degree within 3 years of initial college enrollment. In Appendix Exhibit B1, we provide the number and percentage of high school graduates who enrolled in college and the number who completed a bachelor's degree or associate degree within 100% and 150% of normative time to completion. This descriptive information is provided for the entire 2017–18 high school graduating class, as well as by CCMR indicator.

To measure students' credit accumulation over time, we examined (a) the average number of semesters in which students enrolled in college, and (b) the average number of college credits earned per enrolled semester. We chose to focus on credit accumulation per semester (rather than per year) to account for the fact that some students may only enroll in college for one semester during the school year, which may artificially decrease per-year estimates of credit accumulation. To calculate credit accumulation for each semester, we summed the number of credits associated with non-developmental courses in which students received a passing grade of D or better.[6] If students passed college courses over the summer, those college credits were added to the credit accumulation measure for the preceding spring semester, so that each school year consisted of a maximum of two semesters for all students. The number of

[4] Although the ERC data include enrollment data for independent colleges and universities, students who enroll in these colleges are omitted from this study because course-level data that would allow us to calculate credit accumulation are not available.

[5] Students who completed associate degrees during high school were omitted from these analyses because they completed zero college credits after high school that contributed to their associate degree. The inclusion of these students would bias average credit accumulation toward zero.

[6] In credit accumulation calculations, we included credits for technical courses at community colleges because these credits were associated with full-time status and grade point average, though credits earned through technical classes only applied to the completion of a technical associate degree.

semesters for which credit accumulation was calculated varied across outcome measures, ranging from four semesters (for associate degree completion within 2 years) to 12 semesters (for bachelor's degree completion within 6 years). To identify credit accumulation benchmarks, we calculated the average number of enrolled semesters and the average number of college credits earned per enrolled semester until students completed their highest degree within the first 6 years after initial college enrollment.

To address the second research question, we explored relationships between credit accumulation and two key predictors of degree completion that may directly influence students' capacity to accrue college credits: enrollment status and employment status. For each fall and spring semester, students' enrollment status was measured as part time if they attempted fewer than 12 college credits during the semester, including developmental and technical courses that may not apply toward non-technical degrees. To measure employment status, we relied on Texas UI data to observe whether students were employed during the fall semester (Quarter 4 in the UI data, or October through December) or the spring semester (Quarter 1 in the UI data, or January through March). Next, we calculated for each student the total number of semesters enrolled in college, the number of semesters that they were enrolled part time, and the number of semesters during which they were employed. We then converted these values into a pair of categorical indicators to reflect the proportion of enrolled semesters in which students were enrolled part time and employed: (a) most enrolled semesters (at least half); (b) some enrolled semesters (at least one but fewer than half of semesters); or (c) zero semesters. For employment status, we also identify students who were employed during all semesters. However, because only a small percentage of students who enrolled part time in all semesters completed college degrees, students who enrolled part time for all semesters and students who enrolled part time for most semesters are grouped into a single category. The number of college enrollees in each of these enrollment and employment status categories is provided in Appendix Exhibit B2.

To address the third research question, we explored rates of degree completion for different subgroups of college enrollees based on their college experiences. Three of these college experiences focused on students' first year of college (GPA, developmental course taking, and enrollment in a community college) and three were measured across all semesters that a student enrolled in college (taking a semester off, taking summer courses, and meeting credit accumulation benchmarks). More information about these college experiences that may predict degree completion is provided in Box 1.

Box 1. What College Experiences Predict Degree Completion?

In addition to the completion of CCMR indicators during high school, we explored whether certain experiences during the first year of college predicted successful completion of associate and bachelor's degrees:

- **Grade point average (GPA).** Higher GPAs during the first year of college may reflect student motivation, study skills, or work ethic that predict success in future college courses. We looked at differences between students whose first-year GPA was less than 2.5 and students with a first-year GPA equal to or above 2.5.
- **Developmental course taking.** Taking one or more developmental courses during the first year of college may indicate that students are not adequately prepared for the rigor associated with college courses, which may lead to lower degree completion rates. We compared students who did and did not take a developmental course during the first year of college.
- **Starting at a community college** (bachelor's degree completion only). Starting at a community college may be associated with lower bachelor's degree completion rates, as college credits that students earn at community colleges may not always transfer to a university. Starting at a community college may also reflect students' perceptions of the affordability of attending a university. We compared bachelor's degree completion rates between students who did and did not start at a community college.

In addition to students' enrollment and employment status during college, we examined three measures of students' continuous enrollment in college prior to degree completion:

- **Meeting the credit accumulation benchmark.** Findings associated with the first research question provide the average number of credits completed per enrolled semester among students who successfully completed their bachelor's and associate degrees within 100% of the normative time to completion, which we call the "credit accumulation benchmark." We looked at differences between students for whom the average number of credits accumulated per enrolled semester met or exceeded this credit accumulation benchmark and students whose credit accumulation did not meet the benchmark.
- **Taking a semester off.** Taking at least one semester off after the initial semester of enrollment may be negatively associated with degree completion, as it may reflect challenges related to paying for college, motivation to continue enrollment, or academic performance. We looked at differences between students who did and did not take at least one semester off.
- **Summer course taking.** Taking college courses over the summer may be associated with higher degree completion rates, as college credits earned during the summer may offset reduced enrollment or failed courses during the school year. In addition, earning excess credits over the summer may accelerate degree completion. We looked at differences between students who did and did not complete at least one summer course.

Descriptive statistics for the predictors of degree completion are provided in Appendix Exhibit B2.

In this paper, we present the percentage of college enrollees who completed a degree within 100% and 150% of normative time to completion separately for bachelor's degrees and associate degrees. Completion rates are provided for each of the CCMR indicators, measures of part-time enrollment status and employment status, and additional college experiences that may predict degree completion. In addition, for CCMR indicators and measures of part-time enrollment status and employment status, we present the average number of enrolled semesters and the average number of credits accumulated per enrolled semester among students who completed bachelor's and associate degrees within 100% and 150% of normative time to completion. A brief overview of study limitations related to methods, data, and measures is provided in Box 2. In the sections that follow, we illustrate findings associated with the study's research questions, describe the study limitations in more detail, and discuss implications for policy and future research.

Box 2. Study Limitations

Before describing the study findings, it is important to highlight a few key study limitations. A more detailed description of these limitations is provided after reporting the study findings. In general, limitations relate to the analysis methods, data coverage, and measures included in the study.

- **Findings are descriptive.** This study does not estimate the extent to which college experiences and CCMR indicators uniquely predict degree completion because (a) many of the predictors of degree completion tend to occur together (for example, students who work during college are also more likely to enroll as part-time students); and (b) students are able to complete more than one CCMR indicator. All results illustrate relationships between predictors and degree completion and should be interpreted as descriptive in nature.
- **Immediate college enrollment.** This paper focuses exclusively on students who enrolled in a public Texas college within the first year after high school graduation. Measures of credit accumulation and predictors of degree completion observed for this sample of college enrollees may not be applicable to students who enroll in college more than 1 year after high school graduation.
- **Focus on public institutions.** THECB collects course-level data from public community colleges and universities across the state of Texas. Findings in this paper do not include students who enrolled in independent (private, non-profit) colleges and universities because the ERC does not collect course-level data from these colleges. In addition, this study does not capture degree completion at an independent college for students who enrolled in a public college and then transferred to an independent college, as we were not able to observe the number of college credits students earned at the independent college prior to degree completion.
- **Measures of college affordability.** Although this study examines student employment status during enrolled semesters, it does not broadly examine the financial predictors of college enrollment and persistence. Recognizing that college affordability is likely related to measures included in this study, such as part-time enrollment status and employment status, additional research is needed to explore this domain.

D. Findings

In this section, we present college degree completion rates for groups of students based on their CCMR indicators, measures of enrollment and employment status, and additional predictors of degree completion. To explore the manner in which students who complete a degree accrue college credits, we also examine the average number of enrolled semesters and the average number of credits earned per enrolled semester among college enrollees who successfully completed a bachelor's or associate degree in 100% or 150% of normative time to completion across CCMR indicators and measures of enrollment and employment status.

This study focuses on credit accumulation among students who completed college degrees and identifies additional predictors of degree completion, but it is important to also consider the percentage of high school graduates who enrolled in college during the first year after high school graduation. Lower college enrollment rates may suggest that a more selective subset of students chose to enroll in college. As a result, comparisons of degree completion rates across groups should be interpreted with caution because college enrollment rates may vary across groups. To contextualize the findings presented here, college enrollment rates for all 2017–18 high school graduates and for each of the CCMR indicators are provided in Appendix Exhibit B1. In addition, the number of students who enrolled in college in 2018–19 (used as the denominator for degree completion rates) is provided in figures below for each of the subgroups we examined.

The percentages of 2017–18 high school graduates who enrolled in college in 2018–19 and completed a bachelor's degree within 4 years or 6 years are presented in Exhibit 2 by CCMR indicator. Overall, **37% of college enrollees completed a bachelor's degree within 6 years, with a higher percentage completing their degree within 4 years (21%) than in 5 or 6 years (16%).** This pattern held across a majority of CCMR indicators, suggesting that students who achieved most of the CCMR indicators in high school may have had the necessary tools, experience, or motivation to complete a bachelor's degree more quickly after initial college enrollment. Students who received special education services in high school and completed an advanced diploma were more likely to take 5 or 6 years to complete a bachelor's degree (10%) than 4 years (4%). **Students who did not complete a CCMR indicator in high school were also more likely to take 5 or 6 years to complete their bachelor's degree (8%), rather than 4 years (3%).**

There was considerable variability across CCMR indicators in the percentage of college enrollees who successfully completed a bachelor's degree within the study time frame. **The largest percentage was observed among college enrollees who completed an associate degree during high school, with about 72% completing a bachelor's degree within 6 years of**

initial college enrollment (60% within 4 years; 12% in 5 or 6 years).[7] Likewise, 64% of students who completed the AP/International Baccalaureate (IB) indicator, 63% of students who completed the OnRamps indicator, and 56% of students who completed the dual credit indicator completed their bachelor's degree within 6 years of initial college enrollment, suggesting that college enrollees who took college-level courses in high school were more likely to complete a bachelor's degree within 6 years.

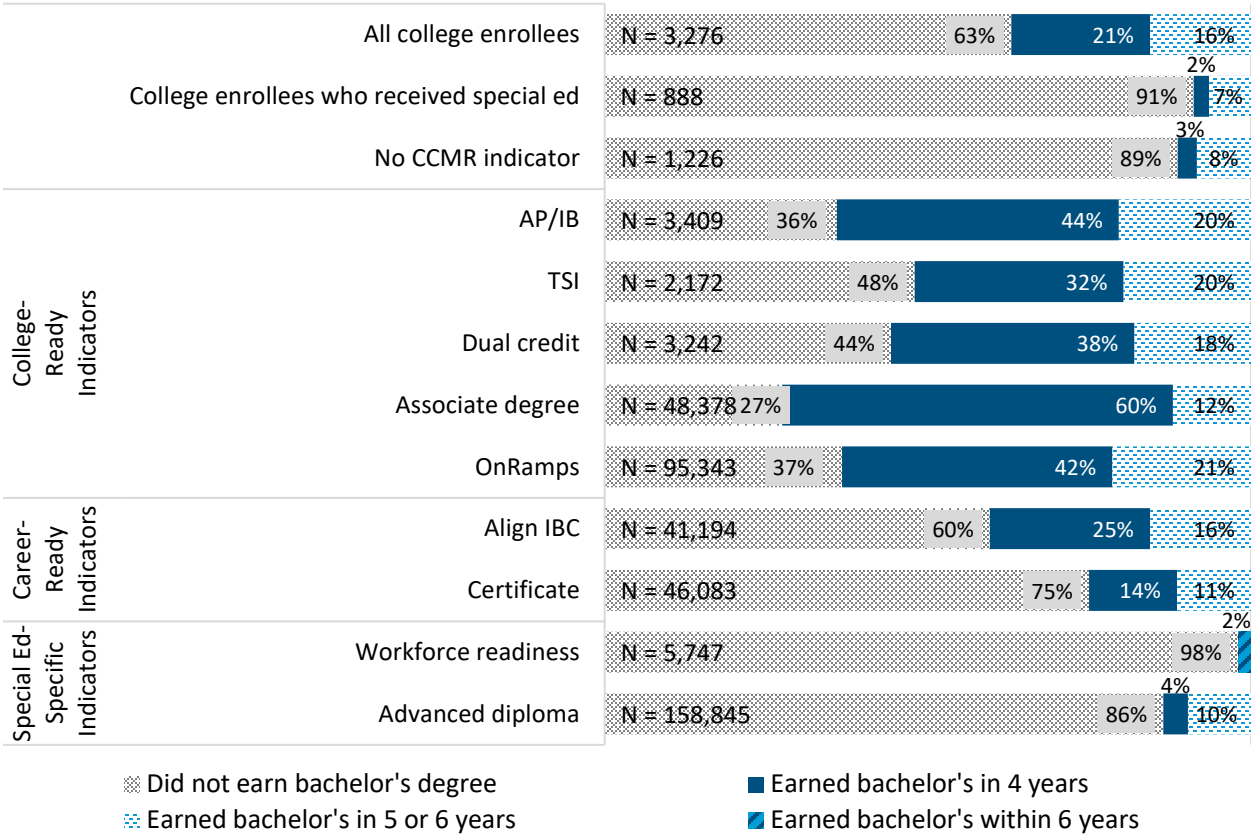
As expected, **college enrollees who completed one of the career-ready CCMR indicators were less likely to complete a bachelor's degree within 6 years**, with 40% of students who earned an aligned industry-based certification completing a bachelor's degree within 6 years, along with 25% of students who completed a Level 1 or Level 2 certificate, and 2% of students who demonstrated workforce readiness (a CCMR indicator for students receiving special education services).[8] It is possible that students who completed a career readiness CCMR indicator in high school were more inclined to pursue another postsecondary pathway, such as directly entering the workforce or enrolling in an associate degree program at a community college.

Of all the 2017–18 high school graduates who immediately enrolled in community college, around 11% completed an associate degree within 3 years of initial college enrollment (see Exhibit 3). Overall, students were slightly more likely to take 3 years to complete the degree (6%) than to take 2 years or less (4%). The rate and speed of associate degree completion among community college enrollees differed across CCMR indicators. **The CCMR indicator with the highest associate degree completion rate (20%) was completion of a Level 1 or Level 2 certificate (13% completed their associate degree within 2 years and 7% completed it in 3 years).** Students who completed the dual credit indicator had a similar rate of successful associate degree completion (19%; 12% within 2 years and 7% in 3 years).

In addition to having lower associate degree completion rates (ranging from 14% to 16%), degree completion rates across the remaining CCMR indicators were higher in the third year after initial college enrollment relative to the first 2 years. This suggests that college credits obtained in pursuit of a Level 1 or Level 2 certificate or through dual credit may be more relevant to completing an associate degree than other college credit opportunities, such as AP/IB. Among students who received special education services, those who earned an advanced diploma were more likely to complete an associate degree within 3 years of initial community college enrollment (7%) than those who demonstrated workforce readiness (3%).[9]

[7] For some CCMR indicators, percentages may not sum to 100% due to rounding.
[8] Among students who demonstrated workforce readiness, we are not permitted to distinguish between students who completed a bachelor's degree within 100% or 150% of normative time to completion due to small sample sizes.
[9] Among students who demonstrated workforce readiness, we are not permitted to distinguish between students who completed an associate degree within 100% or 150% of normative time to completion due to small sample sizes.

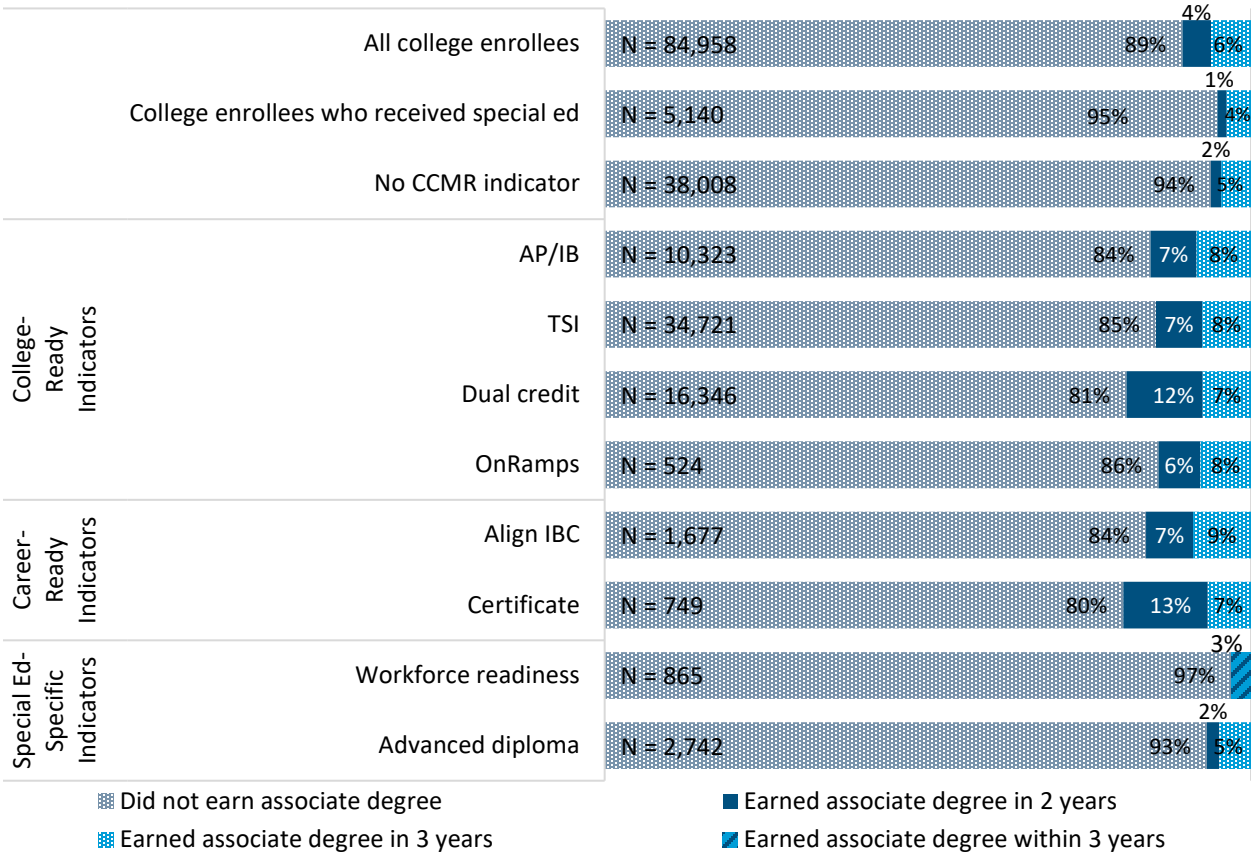
Exhibit 2. Percentage of students who completed a bachelor's degree in 4 years or in the fifth or sixth year after initial college enrollment, overall and by CCMR indicator



Notes. AP = Advanced Placement; CCMR = college, career, and military readiness; HS = high school; IB = International Baccalaureate; IBC = industry-based certification; TSI = Texas Success Initiative; N = number of college enrollees in the denominator of the degree completion rate. The CCMR indicators are not mutually exclusive because students can complete multiple indicators. Students who completed the workforce readiness CCMR indicator and completed their bachelor's degree within 4 years or in 5 or 6 years were combined into a single category in this exhibit due to the small number of students in these categories. Bachelor's degree completion rates were calculated among 2017–18 high school graduates who enrolled in a community college or university in the first year after high school graduation. Percentages may not sum to 100% due to rounding.

Among students who did not complete CCMR indicators in high school, almost 7% of those who enrolled in community college within a year of high school graduation completed an associate degree within 3 years (2% within 2 years and 5% in 3 years). This pattern mirrored the trend observed for bachelor's degree completion, where students who did not earn a CCMR indicator had lower degree completion rates and were more likely to complete their degrees within 150% of normative time to degree completion than within the standard time frame.

Exhibit 3. Percentage of students who completed an associate degree in 2 years or in the third year after initial college enrollment, overall and by CCMR indictor



Notes. AP = Advanced Placement; CCMR = college, career, and military readiness; HS = high school; IB = International Baccalaureate; IBC = industry-based certification; TSI = Texas Success Initiative; N = number of college enrollees in the denominator of the degree completion rate. The CCMR indicators are not mutually exclusive because students can complete multiple indicators. Students who initially enrolled in a community college and later transferred to a university are included in this exhibit among students who did not complete an associate degree. Students who completed the workforce readiness CCMR indicator and completed their associate degree within 2 or 3 years are combined into a single category in this exhibit due to the small number of students in these categories. The associate degree CCMR indicator is not applicable to this analysis and was therefore omitted from the exhibit. Associate degree completion rates were calculated among 2017–18 high school graduates who enrolled in a community college in the first year after high school graduation. Percentages may not sum to 100% due to rounding.

RQ1: What is a reasonable expectation in terms of accumulating college credits for high school graduates directly entering college, and how are CCMR indicators associated with credit accumulation?

On average, students who completed a bachelor's degree within 4 years of beginning college enrolled in 7.4 semesters and earned an average of 14.7 credits per enrolled semester (see Exhibit 4). These averages are slightly less than the eight semesters and 15 credits per semester expected for students to complete a bachelor's degree in 4 years, which suggests that some students applied college credits earned during high school to complete their degree within 4

years. **Students who completed an associate degree during high school had the smallest average number of enrolled semesters (6.2) and earned the fewest credits on average per enrolled semester (13.7).** This suggests that these students may have applied a larger volume of credits earned during high school toward their bachelor's degree than their peers.

Across the other CCMR indicators, students enrolled in a comparable number of semesters, ranging from 7.2 semesters to 7.6 semesters on average. Interestingly, the college readiness CCMR indicators (including TSI, dual credit, AP/IB, associate degree, and OnRamps) were associated with earning fewer credits per semester (ranging from 13.7 credits to 14.7 credits per enrolled semester) than the averages for the career readiness indicators (ranging from 15.2 credits to 15.3 credits per semester) and for students who did not complete CCMR indicators (15.4 credits per semester).[10] This suggests that credits earned while completing college readiness indicators may allow some students to lighten their academic workload as they complete a bachelor's degree within 4 years.

Among students who completed a bachelor's degree within 4 years, the college readiness CCMR indicators were associated with earning fewer credits per semester (ranging from 13.7 credits to 14.7 credits per enrolled semester) than the averages for the career readiness indicators and for students who did not complete CCMR indicators (more than 15 credits per semester).

Students who completed an associate degree within 2 years enrolled for an average of 3.7 semesters and earned an average of 14.3 credits per enrolled semester. This was slightly lower than the expected four semesters and 15 credits per enrolled semester needed to complete an associate degree. Among students who completed their associate degree within 2 years of beginning college, students enrolled in a similar number of semesters on average across CCMR indicators, ranging from 3.3 semesters (completing a Level 1 or Level 2 certificate) to 3.8 semesters (completing OnRamps). Among those who completed their associate degree within 2 years, the average number of credits earned per enrolled semester ranged from 13.1 credits for students who completed dual credit to 14.3 credits for students who completed an aligned industry-based certification. Students who did not complete a CCMR indicator in high school had the highest number of enrolled semesters (3.9) and earned the highest average number of credits per enrolled semester (15.7), suggesting that completing a CCMR indicator may be associated with a reduced academic load while pursuing a 2-year associate degree.

Students who did not complete a CCMR indicator in high school had the highest average number of enrolled semesters (3.9) and earned the highest average number of credits per enrolled semester (15.7), suggesting that completing a CCMR indicator may be associated with a reduced academic load while pursuing a 2-year associate degree.

[10] Results for CCMR indicators for students who received special education services are reported separately, as students who completed these CCMR indicators tended to accumulate a larger average number of college credits per enrolled semester relative to students who completed other CCMR indicators.

Among students who completed a degree within 100% of normative time to completion, those who received special education services during high school accumulated more college credits per enrolled semester on average. For example, those who completed a bachelor's degree within 4 years earned an average of 15.0 credits per semester, while those who completed an associate degree within 2 years earned an average of 14.9 credits per semester. These findings differed across CCMR indicators for students who received special education services, where those who demonstrated workforce readiness tended to earn more credits per enrolled semester to complete a bachelor's degree within 4 years (15.3 credits) or an associate degree within 2 years (18.5 credits) than students who completed an advanced diploma (15.0 credits for a bachelor's degree; 14.7 credits for an associate degree).

As expected, students who completed a degree within 150% of normative time to completion enrolled in more semesters, but earned fewer credits per enrolled semester, compared with their counterparts who completed a degree within 100% of normative time to completion. Students who completed a bachelor's degree in 5 or 6 years enrolled in an average of 9.8 semesters and earned an average of 12.9 credits per semester. Similarly, students who completed an associate degree within 3 years enrolled in an average of 5.6 semesters and earned an average of 11.6 credits per semester. These findings suggest that students may end up enrolling in additional semesters to make up for semesters where they earned fewer credits. The results for students who completed a degree within 150% of normative time to completion by CCMR indicator mimic the pattern observed for those who completed a degree within 100% of normative time to completion (see Exhibit 4).

Exhibit 4. Average number of semesters enrolled and average number of credits earned per enrolled semester among students who completed college degrees, overall and by CCMR indicator

	Among students who completed a bachelor's degree within 4 years		Among students who completed a bachelor's degree in 5 or 6 years		Among students who completed an associate degree within 2 years		Among students who completed an associate degree in 3 years	
	Average semesters enrolled	Average credits per enrolled semester [a]	Average semesters enrolled	Average credits per enrolled semester [a]	Average semesters enrolled	Average credits per enrolled semester[a]	Average semesters enrolled	Average credits per enrolled semester[a]
All college enrollees	**7.4**	**14.7**	**9.8**	**12.9**	**3.7**	**14.3**	**5.6**	**11.6**
College enrollees who received special education	7.5	15.0	10.2	12.7	3.6	14.9	5.7	11.5

	Among students who completed a bachelor's degree within 4 years		Among students who completed a bachelor's degree in 5 or 6 years		Among students who completed an associate degree within 2 years		Among students who completed an associate degree in 3 years	
	Average semesters enrolled	Average credits per enrolled semester [a]	Average semesters enrolled	Average credits per enrolled semester [a]	Average semesters enrolled	Average credits per enrolled semester[a]	Average semesters enrolled	Average credits per enrolled semester[a]
CCMR indicators								
TSI	7.4	14.7	9.8	13.0	3.7	14.2	5.5	11.7
Dual credit	7.2	14.5	9.7	12.6	3.5	13.1	5.4	10.8
AP/IB	7.5	14.5	9.7	12.9	3.7	13.8	5.6	11.4
Associate degree	6.2	13.7	9.2	11.3	NA	NA	NA	NA
OnRamps	7.6	14.7	9.8	13.0	3.8	13.6	5.5	11.8
Align IBC	7.5	15.2	9.7	13.3	3.6	14.3	5.6	11.7
Certificate	7.3	15.2	9.9	12.7	3.3	13.4	5.7	11.3
Workforce readiness[b]	8.0	15.3	10.3	12.6	3.5	18.5	5.8	11.5
Advanced diploma[b]	7.5	15.0	10.2	12.7	3.8	14.7	5.7	11.6
No CCMR indicators	7.8	15.4	10.1	12.9	3.9	15.7	5.7	11.7

Notes. AP = Advanced Placement; CCMR = college, career, and military readiness; IB = International Baccalaureate; IBC = industry-based certification; TSI = Texas Success Initiative; NA = not applicable. Sample sizes for all subgroups of college enrollees are provided in Appendix Exhibit B1. The CCMR indicators are not mutually exclusive because students can complete multiple indicators. The associate degree CCMR indicator is not applicable to the analysis of associate degree completion because these students accumulated zero college credits after high school. "Average semesters enrolled" includes fall and spring semesters only.

[a] For students who earned college credits during the summer, accumulated credits were added to the prior spring semester. More information about the percentage of students accumulating college credits over the summer can be found in Appendix Exhibit B2.

[b] CCMR indicator is used for students enrolled in special education services only.

RQ2: How might expectations differ on the basis of enrollment status (part time versus full time) and whether students are also engaged in the workforce?

Students who never enrolled part time (in other words, those with full-time status in all enrolled semesters) had the highest bachelor's degree completion rate within 6 years of initial college enrollment (56%). This was followed by students who enrolled part time for some (that is, fewer than half) of their enrolled semesters (about 41%). Students who enrolled part time for most (that is, half or more than half) of their enrolled semesters had the lowest

rate of bachelor's degree completion, with just 3% completing their degree within 6 years of initial college enrollment. This suggests that the likelihood of completing a bachelor's degree within 6 years of initial college enrollment is positively related to the number of semesters in which a student enrolls in 12 or more credit hours.

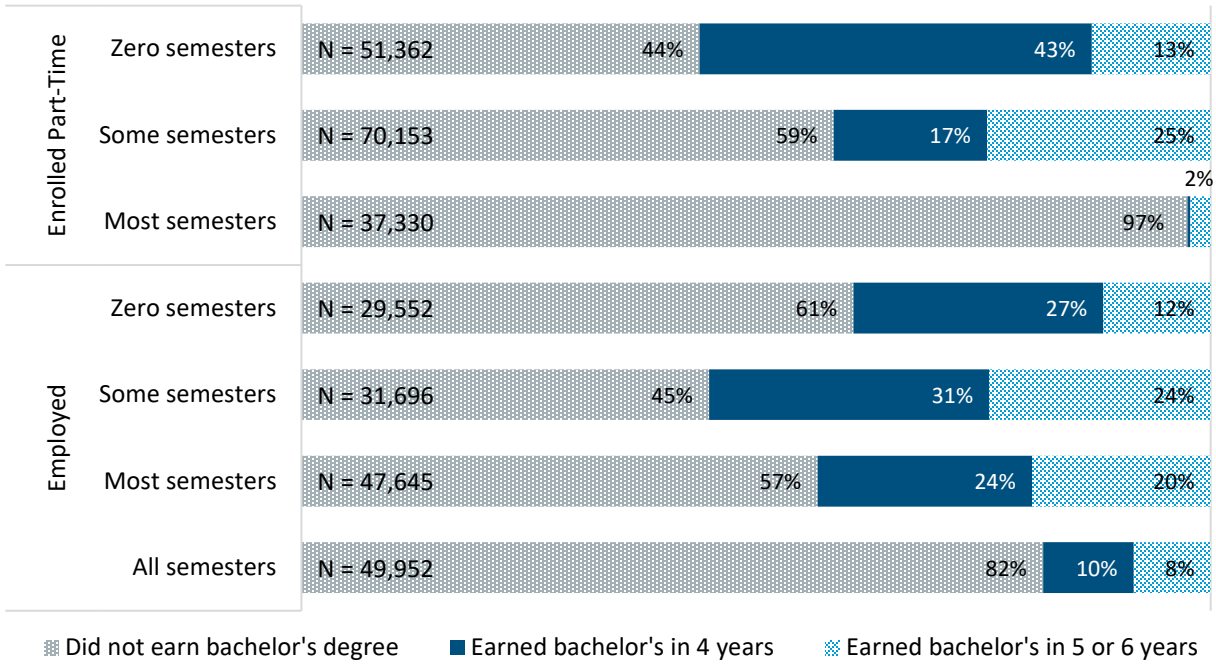
As expected, part-time enrollment status also related to the pace at which students were able to complete a bachelor's degree. Students who were enrolled part time in some (but fewer than half of) their semesters were more likely to complete their degree in 5 or 6 years (25%) than within 4 years (17%). This contrasts with the pattern observed for students who never enrolled part time, who were more likely to complete their degree within 4 years (43%) than in 5 or 6 years (13%). These findings suggest that students who take longer to complete a bachelor's degree are, in part, making up for semesters where they earned fewer credits (for example, through part-time enrollment), rather than primarily making up for credit loss (for example, when a change in major results in previously earned credits not applying towards a student's chosen degree).

When looking at bachelor's degree completion within 6 years of college entry, students who were employed during some of their enrolled semesters had the highest completion rate (55%), and students who were employed during all of their enrolled semesters had the lowest degree completion rate (18%).

Interestingly, **students who were employed during some of their enrolled semesters (55%) or most of their enrolled semesters (43%) were more likely to complete a bachelor's degree within 6 years of initial college enrollment than students who never worked during college (39%).** However, students who were employed during all of their enrolled semesters had the lowest degree completion rate, with just 18% completing a bachelor's degree within 6 years. When we compared the pace at which students completed their degrees, students who were never employed during college had higher rates of bachelor's degree completion within 4 years of initial college enrollment (27%) than in 5 or 6 years (12%). When a student was employed during some, most, or all of their enrolled semesters, they were only somewhat more likely to complete their bachelor's degree within 4 years (31%, 24%, and 10%, respectively) than within 5 or 6 years of initial college enrollment (24%, 20%, and 8%, respectively).

Taken together, these findings suggest that student employment during college is not necessarily a barrier to successful degree completion, particularly when a student is employed for some or most of their college semesters. However, bachelor's degree completion was lowest among students who were employed during all of their enrolled semesters, suggesting that further research is needed to explore factors leading to successful degree completion among students who are employed throughout college.

Exhibit 5. Percentage of students who completed a bachelor's degree within 4 years or in the fifth or sixth year after initial college enrollment, by part-time and employment status



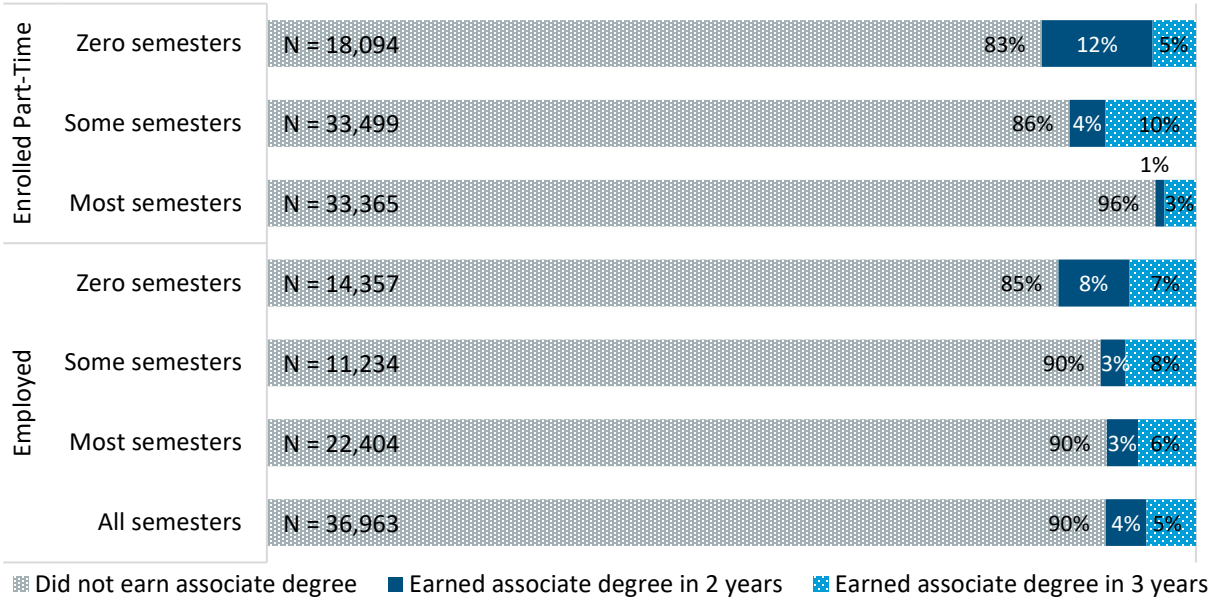
Notes. N = number of college enrollees in the denominator of the degree completion rate. "Some semesters" is defined as at least one but fewer than half of enrolled semesters. "Most semesters" is defined as at least half of enrolled semesters. Results for students who were enrolled part time for all enrolled semesters are combined with results for students who enrolled part time for most enrolled semesters due to the relatively small number of students who enrolled part time for all semesters and completed a college degree. Bachelor's degree completion rates were calculated among 2017–18 high school graduates who enrolled in a community college or university in the first year after high school graduation. Percentages may not sum to 100% due to rounding.

Mirroring the findings for bachelor's degree completion, Exhibit 6 shows that **students who were never enrolled part time had the highest associate degree completion rate within 3 years of initial college enrollment (17%)**. As expected, enrolling part time in a higher percentage of semesters was related to a lower likelihood of completing an associate degree. Specifically, 14% of students who enrolled part time in some but fewer than half of their semesters, and 4% of students who enrolled part time in most semesters, completed an associate degree within 3 years of initial college enrollment. Exhibit 6 also illustrates that a larger percentage of students who never enrolled part time completed their associate degree within 2 years of initial college enrollment (12%) than in 3 years (5%), and that students who enrolled part time in some semesters or most semesters were more likely to complete an associate degree in 3 years (10% and 3%, respectively) than within 2 years (4% and 1%, respectively).

Students who never worked during college had the highest associate degree completion rates within 3 years of college entry (15%). Degree completion rates did not vary much among students who worked during college.

Unlike the findings for bachelor's degree completion, students who never worked during college had the highest associate degree completion rates across employment categories, with 15% completing an associate degree within 3 years of initial college enrollment (8% within 2 years and 7% in 3 years). Higher associate degree completion rates among students who did not work during college may reflect that those students had more capacity to focus on completing required coursework. It is noteworthy that **across the remaining employment categories, associate degree completion rates were similar, with about 10% of students who worked between one and all enrolled semesters completing their associate degree within 3 years of initial college enrollment.** This contrasts with findings for bachelor's degree completion, where students became less likely to complete a degree as the percentage of enrolled semesters during which they worked increased. This perhaps indicates that aspects of community college such as flexible course scheduling or lower costs may be more supportive of working students.

Exhibit 6. Percentage of students who completed an associate degree in 2 years or in the third year after initial college enrollment, by part-time and employment status



Notes. N = number of college enrollees in the denominator of the degree completion rate. "Some semesters" is defined as at least one but fewer than half of enrolled semesters. "Most semesters" is defined as at least half of enrolled semesters. Results for students who were enrolled part time for all enrolled semesters are combined with results for students who enrolled part time for most enrolled semesters due to the relatively small number of students who enrolled part time for all semesters and completed a college degree. Associate degree completion rates were calculated among 2017–18 high school graduates who enrolled in a community college in the first year after high school graduation. Percentages may not sum to 100% due to rounding.

When we focus on students who completed a degree, it is not surprising that students who enrolled in fewer semesters part time earned more credits per semester on average (see Exhibit 7). For example, among those who completed a bachelor's degree within 4 years of initial college enrollment, students who never enrolled part time earned the highest average number of credits per enrolled semester (15.1 credits), followed by students who enrolled part time for some but fewer than half of semesters (13.9 credits) and students who enrolled part time in most semesters (11.4 credits). This pattern was stronger among students who completed a degree in 100% of normative time to completion than those who completed a degree in 150% of normative time to completion. Among those who completed a bachelor's degree within 5 or 6 years, the average number of credits earned per semester was also highest among those who never enrolled part time (13.8 credits) and lowest among those who enrolled part time in most semesters (10.8 credits). This trend was repeated among students who completed an associate degree within 100% and 150% of normative time to degree completion.

Because results in Exhibit 7 are limited to subsets of students who successfully completed degrees within 100% and 150% of normative time to degree completion, students who enrolled in a higher percentage of semesters part time did not appear to require more semesters to complete their degree. Particularly among those who completed their degree within 100% of normative time to completion, the average number of semesters in which they enrolled in college ranged from 7.0 semesters to 7.6 semesters among bachelor's degree completers, and from 3.2 semesters to 3.8 semesters among associate degree completers. This pattern was repeated among students who completed an associate degree within 3 years of initial college enrollment. Only among students who completed a bachelor's degree within 5 or 6 years of initial college enrollment did we find that students who enrolled part time in most semesters were enrolled on average in almost one more semester (10.5) than those who never enrolled part time (9.4).

In contrast to the findings described for part-time enrollment status, student employment status during college *does not* appear to relate to the average number of semesters in which a student enrolled in college or the average number of credits earned per semester for students who completed their degree within 100% or 150% of normative time. Students who completed a bachelor's degree within 4 years enrolled in a similar number of semesters on average (ranging from 7.2 to 7.5) and earned a similar number of credits per enrolled semester (ranging from 14.6 to 14.9) across employment categories. Similarly, among students who completed an associate degree within 2 years of initial college enrollment, the average number of enrolled semesters (ranging from 3.6 to 3.8) did not vary greatly by employment status. However, among students who completed an associate degree within 2 years, the average number of credits earned per enrolled semester was somewhat higher among those who worked during some or no semesters (14.7 credits and 14.6 credits, respectively), relative to students who

worked during most or all semesters (14.2 credits and 14.0 credits, respectively). Trends across employment categories were similar among students who completed degrees within 150% of normative time to completion.

Exhibit 7. Average number of semesters enrolled and average number of credits earned per enrolled semester among students who completed college degrees, by part-time and employment status

	Among students who completed a bachelor's degree within 4 years		Among students who completed a bachelor's degree in 5 or 6 years		Among students who completed an associate degree within 2 years		Among students who completed an associate degree in 3 years	
	Average semesters enrolled	Average credits per enrolled semester[a]	Average semesters enrolled	Average credits per enrolled semester[a]	Average semesters enrolled	Average credits per enrolled semester[a]	Average semesters enrolled	Average credits per enrolled semester[a]
All college enrollees	7.4	14.7	9.8	12.9	3.7	14.3	5.6	11.6
Part-time enrollment status								
Zero semesters	7.4	15.1	9.4	13.8	3.7	15.4	5.4	12.9
Some semesters	7.6	13.9	9.9	12.7	3.8	13.6	5.6	11.7
Most semesters	7.0	11.4	10.5	10.8	3.2	10.0	5.6	10.2
Employment status								
Zero semesters	7.4	14.6	9.8	13.0	3.7	14.6	5.6	11.8
Some semesters	7.5	14.6	9.8	13.0	3.8	14.7	5.6	11.7
Most semesters	7.5	14.7	9.9	12.8	3.8	14.2	5.6	11.6
All semesters	7.2	14.9	9.8	12.7	3.6	14.0	5.5	11.5

Notes. Sample sizes for all subgroups of college enrollees are provided in Appendix Exhibit B2. "Some semesters" is defined as at least one but fewer than half of enrolled semesters. "Most semesters" is defined as at least half of enrolled semesters. Results for students who were enrolled part time for all enrolled semesters are combined with results for students who enrolled part time for most enrolled semesters due to the relatively small number of students who enrolled part time for all semesters and completed a college degree. "Average semesters enrolled" includes fall and spring semesters only.

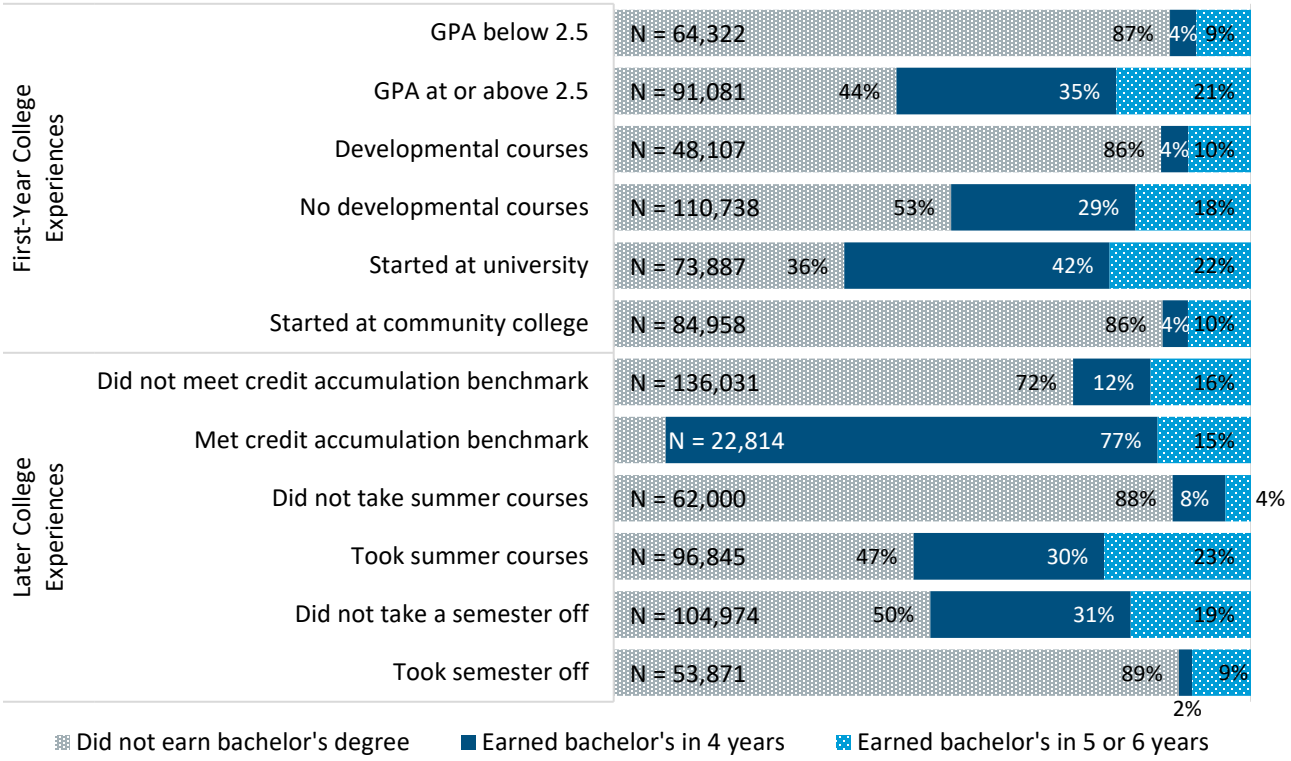
[a] For students who earned college credits during the summer, accumulated credits were added to the prior spring semester. More information about the percentage of students accumulating college credits over the summer can be found in Appendix Exhibit B2.

RQ3: Should additional criteria be used in conjunction with a credit accumulation benchmark to predict successful degree completion?

Overall, **the strongest predictor of bachelor's degree completion was meeting the credit accumulation benchmark, on average, across enrolled semesters** (see Exhibit 8). Among

students whose average number of credits earned per enrolled semester met or exceeded the benchmark of 14.7 credits per enrolled semester, 92% completed a bachelor's degree within 6 years (77% within 4 years; 15% in 5 or 6 years). In contrast, just 28% of college enrollees whose average number of credits earned per enrolled semester did not meet this credit accumulation benchmark on average completed a bachelor's degree within 6 years (12% within 4 years; 16% in 5 or 6 years). While meeting the credit accumulation benchmark was highly predictive of successful bachelor's degree completion, it is important to note that the majority of college enrollees did not meet the benchmark.

Exhibit 8. Percentage of students who completed a bachelor's degree in 4 years or in the fifth or sixth year after initial college enrollment, across college experiences that predict degree completion



Notes. GPA = grade point average; N = number of college enrollees in the denominator of the degree completion rate. The credit accumulation benchmark for bachelor's degree completion was 14.7 credits per enrolled semester on average. The percentage of students who met the credit accumulation benchmark and did not complete a bachelor's degree was 8%. Bachelor's degree completion rates were calculated among 2017–18 high school graduates who enrolled in a community college or university in the first year after high school graduation. Percentages may not sum to 100% due to rounding.

Students who enrolled in summer courses during their college career were more likely to complete their bachelor's degree within 6 years (53%) than students who did not take summer courses (12%). Further, students who took summer courses were more likely to complete a bachelor's degree within 4 years of initial college enrollment (30%) than in 5 or 6

years (23%), suggesting that completing courses over the summer may compensate for part-time enrollment or course failures during the school year. Findings also show that students who remained continuously enrolled completed a bachelor's degree within 6 years of initial college enrollment at higher rates (50%) than students who took a semester off (11%). Taking a semester off also appeared to be related to the pace at which students completed bachelor's degrees. Students who remained continuously enrolled were more likely to complete their degree within 4 years of initial college enrollment than in 5 or 6 years (31% versus 19%), while students who took at least one semester off were more likely to take 5 or 6 years (9%) to complete a bachelor's degree than 4 years (2%).

Findings suggest that bachelor's degree completion is also related to predictors from students' first year of college. For example, **only 13% of students whose first-year GPA was below 2.5 completed their bachelor's degree within 6 years of initial college enrollment (4% within 4 years; 9% within 5 or 6 years).** In contrast, students whose first-year GPA was 2.5 or higher were more likely to complete a bachelor's degree within 6 years of initial college enrollment (56%), with 35% of these students completing their bachelor's degree within 4 years and 21% in 5 or 6 years. In addition, students who did not take developmental courses in their first year of college were more likely to complete a bachelor's degree within 6 years of initial college enrollment (47%) than students who took developmental courses in their first year of college (14%). Further, students who did not take developmental courses in their first year were more likely to complete their bachelor's degree within 4 years of initial college enrollment (29%) than in 5 or 6 years (18%), while students who took developmental courses in the first year were more likely to complete a bachelor's degree in 5 or 6 years (10%) than within 4 years (4%) of initial college enrollment. These findings imply that college readiness and positive first-year college performance increase the likelihood of successfully completing a bachelor's degree and may shorten the average time to degree completion.

Only 13% of students whose first-year GPA was below 2.5 completed their bachelor's degree within 6 years of initial college enrollment, compared with 56% of students whose first-year GPA was 2.5 or higher. In addition, students who did not take developmental courses in their first year of college were more likely to complete a bachelor's degree within 6 years of initial college enrollment (47%) than students who took developmental courses in their first year of college (14%).

Finally, students who began their college careers at a university had higher rates of bachelor's degree completion within 6 years (64%) than students who began at a community college (14%). Among those who started at a university, more students completed a bachelor's degree within 4 years (42%) than in 5 or 6 years (22%). In contrast, students who started at a community college were more likely to take between 5 years and 6 years to complete their degree (10%) than to complete it within 4 years of initial college enrollment (4%). This finding could reflect different intentions among students who enroll in community colleges and those

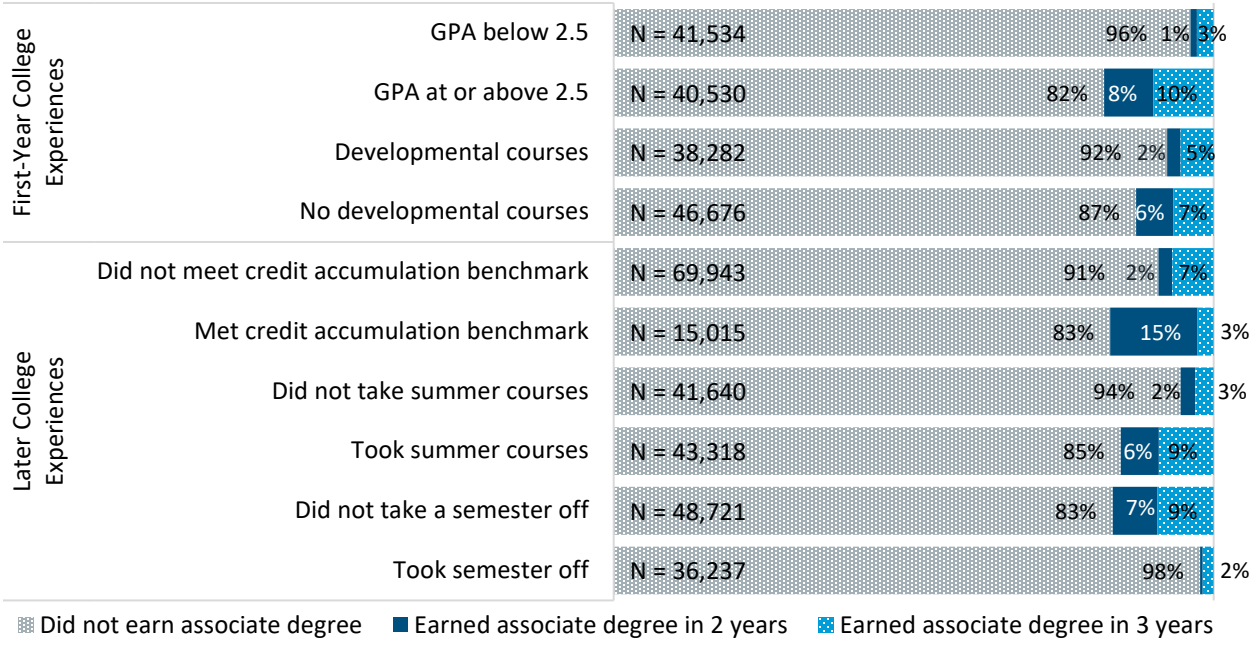
who enroll in universities. It is possible that most students who enroll in a university do so in pursuit of a bachelor's degree, while students who enroll in a community college may have a broader variety of academic goals, such as completing a certificate or an associate degree, in addition to earning credits to transfer to a university and completing a bachelor's degree (Velasco et al., 2024a, 2024b).

The predictors of degree completion were more weakly related to associate degree completion. Although meeting the credit accumulation benchmark and having a first-year GPA of 2.5 or higher were the strongest predictors of associate degree completion, only about 18% of community college enrollees who met these criteria completed an associate degree within 3 years.

As shown in Exhibit 9, **the predictors of degree completion were more weakly related to associate degree completion than bachelor's degree completion**. As with bachelor's degree completion, meeting the credit accumulation benchmark among associate degree completers (14.3 credits per enrolled semester) was one of the strongest predictors of associate degree completion. About 17% of students who met the credit accumulation benchmark on average across enrolled semesters completed an associate degree within 3 years of initial community college enrollment, which is larger than the 9% of students who did not meet the credit accumulation benchmark. Although meeting the credit accumulation benchmark was the strongest predictor of associate degree completion, the relationship was relatively weak when compared to its strong predictive relationship with bachelor's degree completion. This suggests that students who enroll in community college may not be earning credits with the goal of completing an associate degree and may intend their credits to go toward another pathway, such as obtaining a certificate or transferring to a university.

Students who were continuously enrolled in a community college were more likely to complete an associate degree within 3 years of initial college enrollment (about 17%) than students who took a semester or more off (2%). Likewise, students who enrolled in summer courses were more likely to complete an associate degree within 3 years of initial college enrollment (15%) than students who did not take summer courses (about 6%). Among predictors that were measured in students' first year of community college, students who had a first-year GPA of at least 2.5 (18%) and students who did not take developmental courses (13%) were more likely to complete an associate degree within 3 years of initial community college enrollment than peers whose first-year GPA was lower than 2.5 (4%) or who were enrolled in developmental courses (about 8%). These findings mirrored findings for bachelor's degree completion but exhibited weaker relationships, suggesting that additional research is needed to explore the various pathways among community college enrollees and the unique factors related to successful associate degree completion.

Exhibit 9. Percentage of students who completed an associate degree in 2 years or in the third year after initial college enrollment, across college experiences that predict degree completion



Notes. GPA = grade point average; N = number of college enrollees in the denominator of the degree completion rate. The credit accumulation benchmark for associate degree completion was 14.3 credits per enrolled semester on average. Associate degree completion rates were calculated among 2017–18 high school graduates who enrolled in a community college in the first year after high school graduation. Percentages may not sum to 100% due to rounding.

E. Limitations

Several limitations should be considered when interpreting the results of this study. First, analyses are descriptive in nature and findings should not be interpreted as causal evidence. Students may complete more than one CCMR indicator during high school (for example, students may both earn dual credit and complete an associate degree during high school) and many of the predictors of degree completion that we examined in this study tend to co-occur (for example, students who are employed during college may be more likely to be enrolled part time, and students with lower first-year GPAs may be more likely to take a semester off). It would therefore be difficult to determine the extent to which each predictor uniquely relates to rates of degree completion. As a result, comparisons of degree completion rates across different predictors of degree completion should be interpreted with caution.

Second, measures of credit accumulation may not completely capture all the college courses high school graduates completed. Importantly, the data we analyzed only included college credits students earned after high school; any college credits students earned during high

school through dual credit or the successful completion of AP or IB exams did not count toward credit accumulation outcomes. In addition, ERC data do not include data on college courses completed at independent colleges, so this study only considered courses completed at public community colleges and universities in Texas.

Third, this study focused specifically on students who enrolled in a public community college or university in the year immediately following high school graduation. Although the majority of high school graduates who enroll in college do so in the first year following high school graduation (National Center for Education Statistics, n.d.), the characteristics of high school graduates who choose to enroll in college in later years may differ in meaningful ways from the characteristics of those who enroll immediately. In addition, due to a lack of course-level data, this study excluded students who immediately enrolled in or transferred to independent colleges. Therefore, findings pertaining to the subset of high school graduates included in this study may not apply to students who enrolled in college in subsequent years or enrolled in independent colleges prior to degree completion.

Finally, although this study explored a range of predictors of degree completion measured during high school and college, it did not include a key determinant of degree completion: college affordability. Measures such as expected family contribution, receipt of scholarships and loans, and the net cost of attending college were not available in the ERC data. We therefore did not look at financial determinants related to credit accumulation and degree completion, and we were unable to determine the extent to which the predictors of degree completion we examined (for example, taking a semester off or summer course taking) may be driven by these financial considerations.

F. Policy Recommendations and Suggestions for Future Research

Findings in this paper demonstrate the need to focus policies on strategies to support college students and increase degree completion rates. Among all 158,845 high school graduates from 2017–18 who enrolled in a community college or public university in Texas in 2018–19, fewer than half (37%) completed a bachelor's degree within 6 years, and around 11% more completed a terminal associate degree within 3 years. Although students who completed college readiness indicators during high school had higher rates of degree completion, across the indicators, between 81% and 86% of students who enrolled in community colleges did not complete an associate degree within 3 years of initial college enrollment, and between 27% and 48% of college enrollees did not complete a bachelor's degree within 6 years of initial college enrollment. These findings suggest that academic preparation during high school alone is not sufficient to ensure timely degree completion. Given that many postsecondary interventions

target students who struggle academically, higher-achieving students may not be receiving the support that they need to persist and succeed in college. To increase completion rates, colleges may want to identify and resolve barriers to completion among higher-achieving students (for example, financial barriers, advising).

With regard to credit accumulation, findings from this study highlight the extent to which students' completion of college credits during high school relates to higher rates of degree completion, more timely degree completion, and a more manageable workload during college. The credit accumulation benchmarks we identified in this study revealed that, on average, students who completed college degrees within 100% of normative time to completion earned fewer than the anticipated 15 credits per semester. This finding highlights the fact that the vast majority of students who completed a college degree in Texas within 100% of normative time to completion were students who completed CCMR indicators (particularly those that allow students to earn college credits) during high school. For example, students who completed an associate degree during high school and students who completed dual credit were enrolled for fewer semesters on average (6.2 and 7.2, respectively) and completed fewer college credits per enrolled semester on average (13.7and 14.5, respectively) before completing a bachelor's degree within the normative time than students who did not complete CCMR indicators, demonstrating the benefit of accumulating college credits during high school. In contrast, students who completed career readiness indicators during high school and completed bachelor's degrees within 4 years of initial college enrollment took more than 15 college credits per enrolled semester, on average, likely reflecting that these students either did not earn college credits during high school, or that at least some college credits earned during high school did not transfer toward bachelor's degree requirements. These findings support state policies related to affordable dual credit opportunities and college and career readiness school models in Texas that have the potential to increase students' likelihood of degree completion after high school by providing opportunities to earn transferrable college credits during high school.

In general, results suggest that full-time enrollment status is positively related to both degree completion and completing college degrees within the normative time to completion. The lower average number of credits earned per enrolled semester among students who completed degrees within 150% of the normative time to completion (compared with students who completed degrees within 100% of the normative time) further highlights that part-time enrollment extends the time required to complete college degrees. Although students' financial and life situations may not allow for full-time enrollment in college, these findings suggest that college policies and interventions that encourage and facilitate full-time enrollment have the potential to increase degree completion rates and reduce the time (and expense) required to complete college degrees.

Findings in this paper also reveal that predictors of degree completion differ depending on degree type. In general, we observed clear patterns for bachelor's degree completion, where working for fewer semesters, meeting the credit accumulation benchmark, starting at a university, having a first-year GPA equal to or above 2.5, not taking developmental courses, taking summer courses, and not taking a semester off were all associated with higher degree completion rates. In contrast, although students who did not work during college had higher associate degree completion rates (likely reflecting students' ability to afford college without working), associate degree completion rates were largely similar across students who worked for some, most, or all of the semesters in which they were enrolled in college. While the number of semesters during which students worked appeared to be related to bachelor's degree completion, an alternative measure of employment that takes into account the average number of hours students work per week (which is not accurately captured in UI data) or whether employment was on campus or related to students' career interests may be more predictive of associate degree completion.

While having a first-year GPA equal to or above 2.5, not taking developmental courses, not taking a semester off, meeting the credit accumulation benchmark, and taking summer courses were related to higher associate degree completion rates, even across these positive indicators, more than 80% of students did not complete an associate degree within 3 years of initial community college enrollment. One potential explanation for this finding is that not every student who enrolls in community college intends to complete an associate degree. Some students may seek other credentials or certificates, and some may hope to earn college credits that count toward a bachelor's degree after transferring to a university. This finding highlights the importance of identifying and tracking students' degree intentions to ensure that those who wish to complete an associate degree are given the advising and support that they need to achieve their goals. Adding a measure of students' degree intentions to the ERC data system would also allow future research to identify college experiences that more strongly predict successful associate degree completion.

In conclusion, this study aligns with prior research identifying college and career readiness during high school, full-time enrollment status, academic success in the first year of college, consistent college enrollment, and summer course-taking as predictors of increased degree completion rates. However, this study revealed that these predictors were more strongly related to bachelor's degree completion than associate degree completion in Texas, perhaps because available data do not allow us to identify and track students who enroll in community college with the intention of completing an associate degree. Future research is needed to identify additional high school and college experiences that may be more predictive of timely completion of associate degrees.

References

Attewell, P., & Jang, S. H. (2013). Summer coursework and completing college. *Research in Higher Education Journal*, *20*.

Davis, A. M. (2025). Is working in college worth it? How hours on the job affect postsecondary outcomes. *Educational Evaluation and Policy Analysis*, *47*(2), 329–354.

Demeter, E., Dorodchi, M., Al-Hossami, E., Benedict, A., Slattery Walker, L., & Smail, J. (2022). Predicting first-time-in-college students' degree completion outcomes. *Higher Education*, *84*(3), 589–609.

National Center for Education Statistics. (n.d.). *Fast facts: Immediate transition to college*. Institute of Education Sciences. https://nces.ed.gov/fastfacts/display.asp?id=51#:~:text=In%20every%20year%20from%202012,Condition%20of%20Education%20Reader%27s%20Guide

Texas Education Agency. (2024). *2024 accountability manual for Texas public school districts and campuses*. https://tea.texas.gov/texas-schools/accountability/academic-accountability/performance-reporting/2024-accountability-manual-full.pdf

U.S. Bureau of Labor Statistics. (n.d.). *Wage records program*. https://www.bls.gov/wrp/overview.htm#TX

Velasco, T., Fink, J., Bedoya, M., & Jenkins, D. (2024a). *Tracking transfer: Community college effectiveness in broadening bachelor's degree attainment.* Community College Research Center, Aspen Institute College Excellence Program, and National Student Clearinghouse Research Center. https://ccrc.tc.columbia.edu/wp-content/uploads/2024/02/tracking-transfer-community-college-effectiveness-1.pdf

Velasco, T., Fink, J., Bedoya, M., & Jenkins, D. (2024b). *Tracking transfer: Four-year institutional effectiveness in broadening bachelor's degree attainment.* Community College Research Center, Aspen Institute College Excellence Program, and National Student Clearinghouse Research Center. https://ccrc.tc.columbia.edu/wp-content/uploads/2024/02/tracking-transfer-four-year-institutional-effectiveness-1.pdf

Zeiser, K. & Cain, M. (2025). *Texas college, career, and military readiness indicator study: Examining time to a self-sufficiency standard wage.* https://www.air.org/sites/default/files/2025-09/TEA-Texas-College-Career-Military-Readiness-White-Paper-508-July-2025.pdf

Appendix A. Data and Measures

Data Sources and Study Sample

The study used deidentified, student-level, administrative data from Texas that were available through the Texas Education Agency (TEA) and the data repository at the Texas Education Research Center at the University of Texas at Austin. Data used in this study included public education information from prekindergarten–Grade 12 schools collected by TEA, information from public institutions of higher education collected by the Texas Higher Education Coordinating Board, and students' employment data collected quarterly through the Unemployment Insurance (UI) report by the Texas Workforce Commission. Although not all jobs are captured in the UI data system, more than 95% of the civilian labor force nationally is covered by UI records (U.S. Bureau of Labor Statistics, n.d.). The data also contained a file that included the college, career, and military readiness (CCMR) accountability standards completed by each 2017–18 high school graduate, as calculated by TEA staff.

Analyses in this study focused on two overlapping samples of college enrollees in Texas. To identify predictors of bachelor's degree completion, analyses included all 2017–18 high school graduates who enrolled in a public community college or university in 2018–19, measuring college experiences and outcomes for up to 6 years after initial college enrollment. To identify predictors of associate degree completion, we examined a subset of these students who (a) enrolled in a public community college in 2018–19 and (b) did not complete an associate degree during high school, measuring college experiences and outcomes for up to 3 years after initial college enrollment.

Measures

Definitions for all outcome measures and predictors of college degree completion are provided in Exhibit A1.

Exhibit A1. Outcome Measures and Predictors of College Degree Completion

Measure name	Definition
Outcome measures	
Associate degree completion within 100% of normative time	The student completed an associate degree within 2 years of initial college enrollment.

Measure name	Definition
Associate degree completion within 150% of normative time	The student completed an associate degree within 3 years of initial college enrollment.
Bachelor's degree completion within 100% of normative time	The student completed a bachelor's degree within 4 years of initial college enrollment.
Bachelor's degree completion within 150% of normative time	The student completed a bachelor's degree within 6 years of initial college enrollment.
Credit accumulation	The number of credits associated with non-developmental courses in which students received a passing grade of D or better, summed across courses each semester of enrollment and divided by the number of enrolled semesters. If students passed college courses over the summer, those college credits were added to the credit accumulation measure for the preceding spring semester, so that each school year consisted of a maximum of two semesters for all students.
Predictors of degree completion	
Enrollment status	The student was enrolled part time (attempted fewer than 12 college credits) for (a) none of the enrolled semesters; (b) some enrolled semesters (at least one but fewer than half); or (c) most enrolled semesters (half or more than half of enrolled semesters, including a small number of students who were enrolled at part-time status for all enrolled semesters).
Employment status	The student was identified as employed (that is, they appeared in Unemployment Insurance data in Quarter 4 for the fall semester or Quarter 1 for the spring semester) for (a) none of the enrolled semesters; (b) some enrolled semesters (at least one but fewer than half); (c) most enrolled semesters (at least half but not all); and (d) all enrolled semesters.
Year 1 grade point average	This is the average grade points earned in all completed courses (excluding developmental courses) in the fall 2018 and spring 2019 semesters, weighted by credit hours. Values range from 0.0 to 4.0, with higher scores indicating higher academic achievement.
Year 1 developmental course taking	The student attempted at least one course identified as developmental during the first year of college.
Enrolled in a community college in Year 1	The student was enrolled in a community college and did not enroll in a university in the first year of college. (This is only a predictor for bachelor's degree completion outcomes.)
Meeting credit accumulation benchmarks	On average across enrolled semesters, the student completed the average number of college credits in non-developmental courses that was observed among students who completed degrees within 100% of normative time to completion (14.7 college credits for bachelor's degree completion within 4 years, and 14.3 credits for associate degree completion within 2 years).
Taking a semester off	The student was not enrolled in college for a fall or spring semester after the first semester of enrollment but subsequently re-enrolled in college (for example, enrolled in college in fall 2020 and fall 2021 but did not enroll in college in spring 2021).
Summer course taking	The student enrolled in at least one summer course.

Appendix B. Supporting Tables

Exhibit B1. Number of students who enrolled in college and completed an associate or bachelor's degree, by college type, degree type and timing, and CCMR indicator

Student population	Number of high school graduates	Number enrolled in college in 2018–19	Percentage enrolled in college in 2018–19	Among students who enrolled in college in 2018–19		Number enrolled in a community college in 2018–19	Percentage enrolled in a community college in 2018–19	Among students who enrolled in a community college in 2018–19	
				Number completing a bachelor's degree in 4 years	Number completing a bachelor's degree in 5 or 6 years			Number completing an associate degree in 2 years	Number completing an associate degree in 3 years
All college enrollees	347,850	158,845	34.7%	34,101	24,805	84,958	24.4%	3,765	5,243
All college enrollees who received special education services in high school	25,954	5,747	22.1%	136	374	5,140	19.8%	73	194
CCMR indicators									
TSI	146,424	95,343	65.1%	30,785	18,804	34,721	23.7%	2,477	2,621
Dual credit	71,983	48,378	67.2%	18,219	8,719	16,346	22.7%	1,929	1,223
AP/IB	70,936	41,194	58.1%	17,983	8,416	10,323	14.6%	735	868
Associate degree[a]	5,035	3,242	64.4%	1,961	391	NA	NA	NA	NA
OnRamps	3,348	2,172	64.9%	908	466	524	15.7%	34	41
Align IBC	5,396	3,409	63.2%	845	532	1,677	31.1%	122	150
Certificate	2,029	1,226	60.4%	167	140	749	36.9%	98	50

Student population	Number of high school graduates	Number enrolled in college in 2018–19	Percentage enrolled in college in 2018–19	Among students who enrolled in college in 2018–19		Number enrolled in a community college in 2018–19	Percentage enrolled in a community college in 2018–19	Among students who enrolled in a community college in 2018–19	
				Number completing a bachelor's degree in 4 years	Number completing a bachelor's degree in 5 or 6 years			Number completing an associate degree in 2 years	Number completing an associate degree in 3 years
Workforce readiness[b]	5,817	888	15.3%	*	*	865	14.9%	*	*
Advanced diploma[b]	8,880	3,276	36.9%	126	319	2,742	30.9%	53	134
No CCMR indicators	159,729	46,083	28.9%	1,361	3,854	38,008	23.8%	608	1,747

Note. AP = Advanced Placement; CCMR = college, career, and military readiness; IB = International Baccalaureate; IBC = industry-based certification; TSI = Texas Success Initiative; NA = not applicable.

[a] Students who completed associate degrees during high school were omitted from these analyses because they completed zero college credits after high school that contributed to their associate degree. The inclusion of these students would bias the average credit accumulation toward zero.

[b] CCMR indicators are designed specifically for students receiving special education services.

* Indicates masking due to small sample sizes.

Exhibit B2. Number of students who enrolled in college and completed an associate or bachelor's degree, by college type, degree type and timing, and predictors of degree completion

Student population	Number enrolled in community college or university in 2018–19	Among students who enrolled in college in 2018–19		Number enrolled in a community college in 2018–19	Among students who enrolled in a community college in 2018–19	
		Number completing a bachelor's degree in 4 years	Number completing a bachelor's degree in 5 or 6 years		Number completing an associate degree in 2 years	Number completing an associate degree in 3 years
All college enrollees	158,845	34,101	24,805	84,958	3,765	5,243
Part-time enrollment status						
Zero semesters	51,362	22,148	6,720	18,094	2,156	846
Some semesters	70,153	11,834	17,252	33,499	1,282	3,270
Most semesters	37,330	119	833	33,365	327	997
Employment status						
Zero semesters	29,552	8,125	3,487	14,357	1,094	1,032
Some semesters	31,696	9,764	7,719	11,234	299	852
Most semesters	47,645	11,234	9,368	22,404	758	1,394
All semesters	49,952	4,978	4,231	36,963	1,614	1,965
Predictors in first year of college						
GPA below 2.5	64,322	2,654	5,525	41,534	423	1,169
GPA at or above 2.5	91,081	31,441	19,240	40,530	3,341	4,067
Developmental course(s)	48,107	2,069	4,730	38,282	865	2,103
No developmental course(s)	110,738	32,032	20,075	46,676	2,900	3,140
Started at university	73,887	30,751	16,402	NA	NA	NA

Student population	Number enrolled in community college or university in 2018–19	Among students who enrolled in college in 2018–19		Number enrolled in a community college in 2018–19	Among students who enrolled in a community college in 2018–19	
		Number completing a bachelor's degree in 4 years	Number completing a bachelor's degree in 5 or 6 years		Number completing an associate degree in 2 years	Number completing an associate degree in 3 years
Started at community college	84,958	3,350	8,403	NA	NA	NA
Later college enrollment experiences						
Did not meet credit accumulation benchmark	136,031	16,498	21,459	69,943	1,583	4,839
Met credit accumulation benchmark	22,814	17,603	3,346	15,015	2,182	404
Did not take summer course(s)	62,000	5,142	2,492	41,640	1,023	1,283
Took summer course(s)	96,845	28,959	22,313	43,318	2,742	3,960
Did not take semester(s) off	104,974	32,973	19,841	48,721	3,613	4,574
Took semester(s) off	53,871	1,128	4,964	36,237	152	669

Note. GPA = grade point average; NA = not applicable. "Some semesters" is defined as at least one but fewer than half of enrolled semesters. "Most semesters" is defined as at least half of enrolled semesters. Results for students who were enrolled part time for all enrolled semesters are combined with results for students who enrolled part time for most enrolled semesters due to the relatively small number of students who enrolled part time for all semesters and completed a college degree. The credit accumulation benchmark for bachelor's degree completion was 14.7 credits per enrolled semester on average, and the benchmark for associate degree completion was 14.3 credits per enrolled semester on average.

About the American Institutes for Research®

Established in 1946, the American Institutes for Research® (AIR®) is a nonpartisan, not-for-profit institution that conducts behavioral and social science research and delivers technical assistance both domestically and internationally in the areas of education, health, and the workforce. AIR's work is driven by its mission to generate and use rigorous evidence that contributes to a better, more equitable world. With headquarters in Arlington, Virginia, AIR has offices across the U.S. and abroad. For more information, visit AIR.ORG.

AIR® Headquarters
1400 Crystal Drive, 10th Floor
Arlington, VA 22202-3289
+1.202.403.5000 | **AIR.ORG**

28863_9/25