Texas Students' Progress Under the Foundation High School Program

Lynn Mellor and Molly Cain

FEBRUARY 2024

American Institutes for Research® | AIR.ORG

AIR®
Advancing Evidence.
Improving Lives.

Abstract

For students entering Grade 9 in the 2014–15 school year and later, Texas modified its public high school graduation requirements by enacting House Bill 5 (HB 5) during the 83rd Texas Legislature. These changes provided students with greater flexibility in the courses required for graduation (including eliminating Algebra II as a required course) and the opportunity to focus on postsecondary opportunities and career paths by completing an endorsement. This descriptive study used state longitudinal administrative data to examine the graduation pathways of the first three Grade 9 cohorts who entered high school under the new Foundation High School Program (2014–15, 2015–16, and 2016–17). Results indicate that more than 80% of graduates earned the distinguished level of achievement, which included the completion of Algebra II. Student inequities persisted under the Foundation High School Program. Gaps across student groups continued in the types of courses that students completed. The percentage of graduates who earned the distinguished level of achievement, driven by Algebra II completion, was lower for Black and Hispanic students than for White and Asian students. Race/ethnicity and special student population gaps remained in the percentage of graduates taking Algebra II before and after the change in graduation requirements. Although critics feared making Algebra II optional would reduce the number of students taking Algebra II, Algebra II completion rates continued to increase after the policy. Excluding Multidisciplinary Studies, Business and Industry and Arts and Humanities had the largest percentage of graduates completing the endorsements and remained fairly consistent across the first three cohorts. Fewer students earned STEM and Public Services endorsements.

Acknowledgments

We thank staff at the Texas Education Agency for their partnership in this research. This work was supported by the Institute of Education Sciences (IES), U.S. Department of Education, through Grant R305H170006, to the American Institutes for Research® (AIR®). The opinions expressed are those of the authors and do not represent the views of IES or the U.S. Department of Education. Any errors are attributable to the authors.

Contents

Exhibits

Introduction

For students entering Grade 9 in 2014–15 and later, Texas modified its public high school graduation requirements by enacting House Bill 5 (HB 5) during the 83rd Texas Legislature. These changes provided students with greater flexibility in the courses required for graduation and the opportunity to focus on postsecondary opportunities and career paths by completing an endorsement. In the short term, course flexibility was expected to influence student engagement and the perceived relevance of coursework and thus increase graduation rates. In the medium term, it was thought that students would further pursue the career path they started in high school by continuing their education or training in a 2- or 4-year college and eventually earn a college degree or workforce certificate.

The new Foundation High School Program established by HB 5 requires a minimum of 22 credits to graduate, which includes four credits in English and three credits each in mathematics, science, and social studies. To earn an optional endorsement requires an additional four credits.[1] Prior to the Foundation High School Program, there were three high school programs: the Minimum High School Program (MHSP), the Recommended High School Program (RHSP), and the Distinguished Achievement Program (DAP). For the default high school program, the RHSP, and the DAP students were required to complete 26 credits, including four credits each in English, mathematics, science, and social studies. Within each of these core subject areas (English, mathematics, science, and social studies), specific courses were required (e.g., Algebra II in mathematics) because these requirements earned students the credits they needed for admission to most 4-year universities (TEA, 2011). To emphasize postsecondary opportunities and career preparation, HB 5 provided students with the option to complete an endorsement in five areas: Arts and Humanities, Business and Industry, Public Services, STEM, and Multidisciplinary Studies. Endorsements consist of a selection of courses grouped together by interest or occupational skill to provide students with in-depth knowledge of a subject area. Students must select an endorsement when they enter Grade 9.[2] The courses in an endorsement help students to learn more about specific areas they may be interested in pursuing in postsecondary education or training or careers.

[1] A student may opt out of earning an endorsement if, after their sophomore year, the student's parent signs a form permitting the student to graduate without earning an endorsement.
[2] Upon entering Grade 9, students must indicate in writing which endorsement they intend to pursue. However, students have the option to change the endorsement at any time any time before the end of the student's sophomore year.

To accommodate this focus, the completion of each endorsement includes multiple pathways or sets of courses students can complete to earn the endorsement.[3]

To earn an endorsement, students must complete a fourth credit in mathematics, a fourth credit in science, two additional elective courses, and the curriculum requirements for the endorsement to total 26 credits (see Exhibit 1 for a summary of the graduation requirements).

[3] Although high school students can select from five endorsements, individual districts select the endorsements they offer and the curriculum options available to students to complete each endorsement. If districts select only one endorsement, it must be Multidisciplinary Studies.

Exhibit 1. Texas High School Graduation Requirements Under the Foundation High School Program

Subject	Foundation High School Program		Foundation High School Program plus endorsement		Options for the endorsement selection of courses
	Credits	Required courses	Credits	Required courses	
English language arts	4	English I, English II, English III, and an advanced English course	4	English I, English II, English III, and an advanced English course	**Arts and Humanities** 1. Two levels each in two languages other than English (LOTEs) 2. Four levels in the same LOTE 3. Courses from one or two disciplines in fine arts (music, theater, art, dance, or film) 4. English electives not included in the Business and Industry endorsement 5. Social studies 6. Four levels of American Sign Language
Mathematics	3	Algebra I, Geometry, and an advanced mathematics course	4	Algebra I, Geometry, and an advanced mathematics course	**Business and Industry** 1. A coherent sequence of career and technical education (CTE) courses or an approved CTE program of study related to Business and Industry [a] 2. English electives in public speaking, debate, advanced broadcast journalism, and advanced journalism including newspaper and yearbook 3. Information technology
Science	3	Biology, Integrated Physics and Chemistry, Chemistry, Physics, and an advanced science course	4	Biology, Integrated Physics and Chemistry, Chemistry, Physics, and an advanced science course	**Public Services** 1. A coherent sequence of CTE courses or an approved CTE program of study related to Public Services 2. Junior Reserve Officer Training Corps (JROTC)

Subject	Foundation High School Program		Foundation High School Program plus endorsement		Options for the endorsement selection of courses
	Credits	Required courses	Credits	Required courses	
Social studies	3	U.S. History, U.S. Government (.5 credit), Economics (.5 credit), World History, or World Geography	3	U.S. History, U.S. Government (.5 credit), Economics (.5 credit), World History, or World Geography	**Multidisciplinary Studies** 1. Four advanced courses that prepare a student to enter the workforce successfully or postsecondary education without remediation 2. Four credits in each foundation subject area, including chemistry and/or physics and English IV or a comparable Advanced Placement (AP) or International Baccalaureate (IB) English course 3. Four credits in AP, IB, or dual credit courses selected from English, mathematics, science, social studies, economics, LOTE, or fine arts
LOTE	2	Two credits in same language or two credits from computer programming languages, including computer coding	2	Two credits in same language or two credits from computer programming languages, including computer coding	**STEM** 1. A coherent sequence of CTE courses or an approved CTE program of study related to STEM [a] 2. Mathematics 3. Science
Physical education	1		1		
Fine arts	1		1		
Electives	5		7		
Total credits	**22**		**26**		

Note. Material adapted from the Texas Education Agency's Graduation Toolkit. This represents an abbreviated list of courses. Please refer to Chapter 74 of the Texas Administrative Code for course option details, https://tea.texas.gov/about-tea/laws-and-rules/texas-administrative-code/19-tac-chapter-74.

[a] For more information on CTE-related programs of study, see https://tea.texas.gov/academics/college-career-and-military-prep/career-and-technical-education/approved-statewide-cte-programs-of-study.

In addition to earning an endorsement, students can earn distinguished level of achievement by completing Algebra II, and additional performance acknowledgments. The distinguished level of achievement prepares students for transition to postsecondary education and training and is a requirement for admission to a Texas public university under the top 10% automatic admission law (Texas Education Agency [TEA], 2020a). The curriculum requirements of the Foundation High School Program with an endorsement are similar to the previous RHSP and DAP.

The elimination of Algebra II as a required mathematics course was one of the more significant changes from the RHSP and DAP graduation requirements because Algebra II is an admission requirement for most public 4-year universities in Texas and the United States.[4] Students who gain admission to 4-year universities will most likely need to complete remedial mathematics prior to earning college-level mathematics credits if they do not take Algebra II (Holzman & Lewis, 2020). With the elimination of Algebra II as the required third mathematics course, the Texas State Board of Education introduced two new course options in algebraic reasoning and statistics.[5] Critics of HB 5 viewed the removal of Algebra II as a requirement as problematic, arguing that young teenagers should not be allowed to make course selection decisions that can have a significant impact on their future career prospects related to attending college. Furthermore, critics contended that all students should be prepared to meet the challenges required in a competitive workforce, whether or not their future includes college. Many critics expected the changes to have the largest negative effects on African American and Hispanic students, who have traditionally fallen behind other students in the state in terms of college readiness and enrollment. Under the previous curriculum requirements, Algebra II completion rates rose for all racial/ethnic groups and had stabilized right before enactment of the HB 5 legislation (Stoker et al., 2018).

Study Overview

In 2017, the American Institutes for Research (AIR), in partnership with TEA, was awarded an Evaluation of State and Local Education Programs and Policies research grant to examine the impact of HB 5 on student outcomes.[6] This study examined the first three Grade 9 cohorts who entered high school under the Foundation High School Program (2014–15 through 2016–17) and investigated the extent to which students were taking advantage of the greater flexibility in course requirements and increased emphasis on postsecondary

[4] Students also may fulfill the mathematics admissions requirements by scoring high enough on the SAT or ACT.
[5] See Appendix B for a list of courses that fulfill the third mathematics course requirement.
[6] A 5-year grant (2017–2022) funded by the Institute of Education Sciences, the research arm of the U.S. Department of Education.

readiness and career preparation available under the Foundation High School Program. The study answered the following four descriptive research questions:

1. What percentage of graduates completed the Foundation High School Program, the Foundation High School Program plus an endorsement, and the distinguished level of achievement?
    a. Are there differences in completion by race/ethnicity or by student groups (i.e., students from economically disadvantaged backgrounds, students who are emergent bilingual, or students receiving special education services)?
    b. Are there differences across entering Grade 9 cohorts?
2. What percentage of graduates completed each endorsement?
    a. Are there differences in endorsement completion by race/ethnicity or special student populations?
    b. Are there differences across entering Grade 9 cohorts?
3. What percentage of graduates completed each endorsement by completing a CTE program of study and are there differences by race/ethnicity or by student group?
4. Which mathematics courses did graduates complete to fulfill the advanced mathematics requirements?
    a. What percentage of students completed Algebra II?
    b. What percentage of students completed the new alternative Algebra II courses (e.g., Algebraic Reasoning, Statistics)?

Appendix A provides detailed information about the data sources, the study population, and the methods used in this research study.

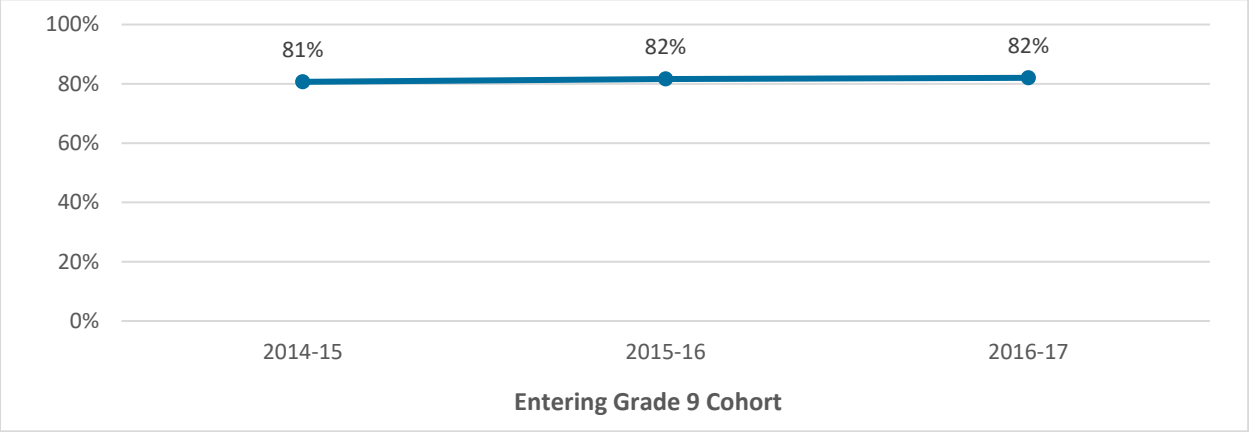
Findings

This section presents the main findings from the four research questions.

Across cohorts, most students graduated under the Foundation High School Program within 4 years of entering Grade 9

Across the first three cohorts graduating under the Foundation High School Program, 4-year graduation rates remained stable, at slightly above 80% for each cohort (Exhibit 2).

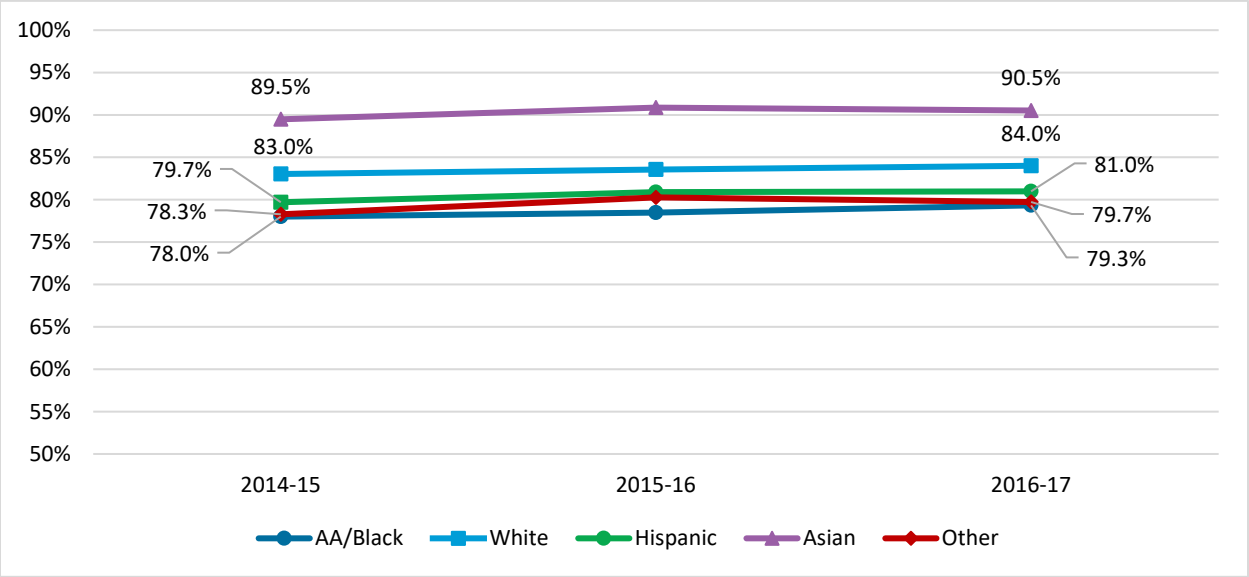
Exhibit 2. Percentage of Students in Each Post–HB 5 Cohort Who Graduate From a Texas Public High School Within 4 Years



Note. Graph based on authors' analysis of data described in Appendix A.

However, 4-year graduation rates differed by student groups. A higher percentage of Asian students graduated within 4 years of entering Grade 9 (ranging between 90% and 91% across the three cohorts) compared with students from other racial/ethnic groups (Exhibit 3). Four-year graduation rate gaps for African American and Hispanic students closed slightly for the 2016–17 cohort, which may be attributed to relaxed state graduation standards introduced during the COVID-19 pandemic (TEA, 2020b).

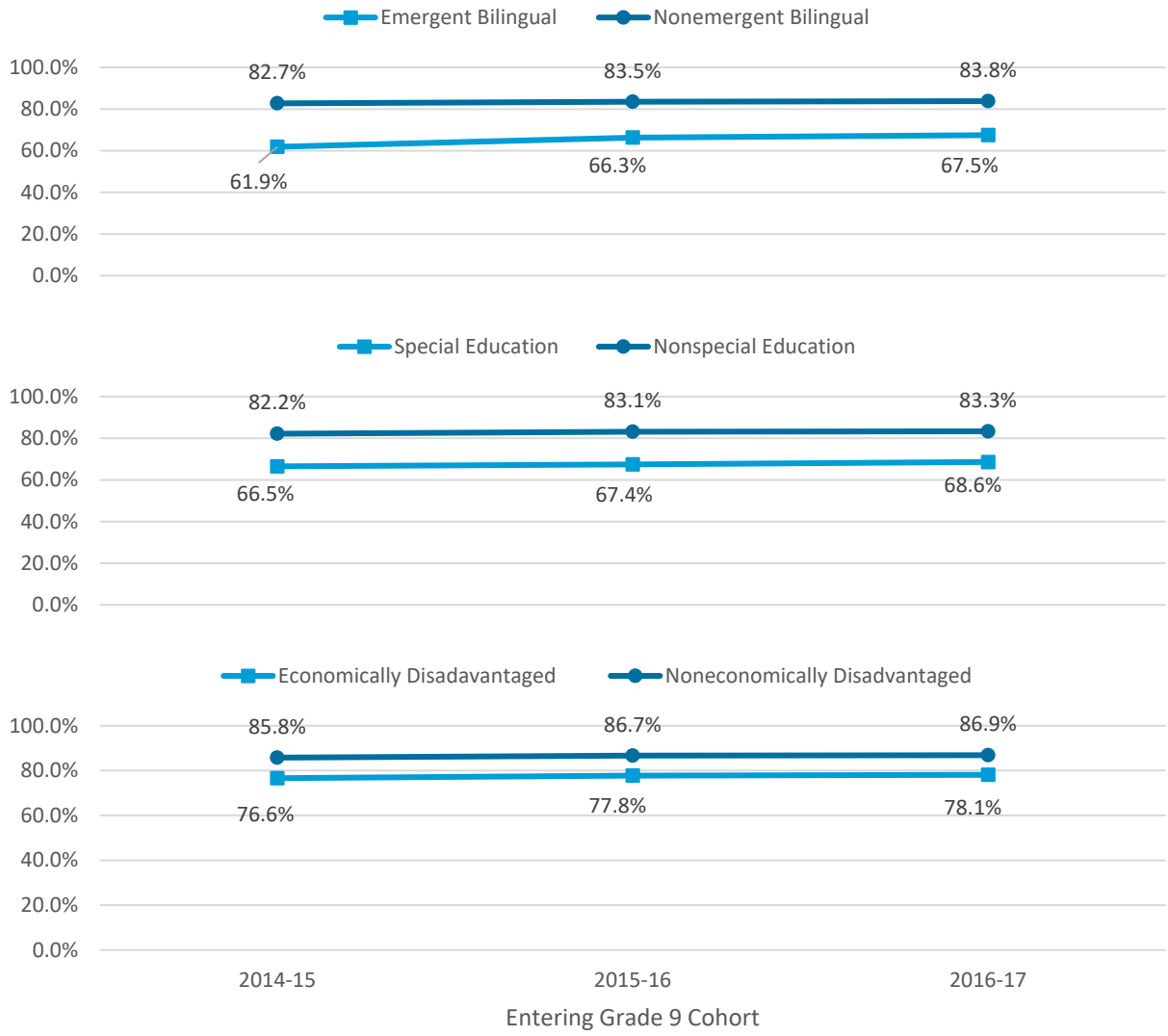
Exhibit 3. Percentage of Students in Each Cohort Who Graduate From a Texas Public High School Within 4 Years, by Race/Ethnicity



Note. AA = African American. Graph based on authors' analysis of data described in Appendix A.

Graduation rates also varied by special student populations. Four-year graduation rates increased by 5.6 percentage points (from 61.9% to 67.5%) for emergent bilingual students, but they remained steady at 83% for nonemergent bilingual students (Exhibit 4). The gap in 4-year graduation rates was larger for students receiving special education services compared with students not receiving special education services (Exhibit 4). Finally, although students from economically disadvantaged backgrounds had lower graduation rates relative to their peers from noneconomically disadvantaged backgrounds, the gap in 4-year graduation rates was smaller than the gaps for emergent bilingual students and students receiving special education services.

Exhibit 4. Percentage of Students in Each Cohort Who Graduate From a Texas Public High School Within 4 Years by Special Student Populations

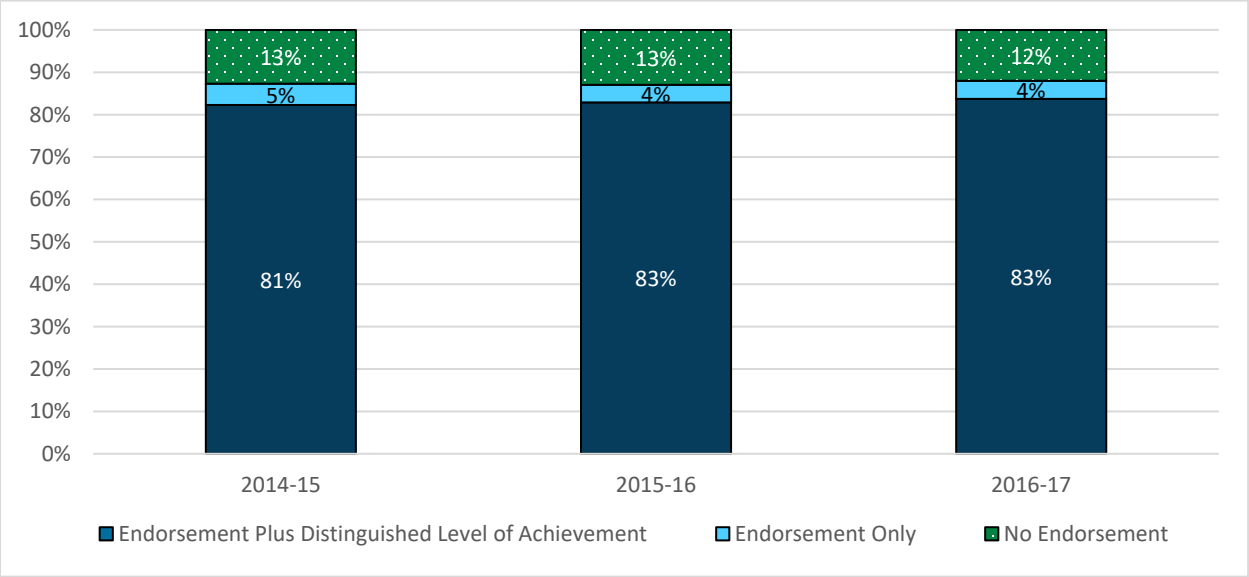


Note. Graphs based on authors' analysis of data described in Appendix A.

Across cohorts, most students graduated with an endorsement plus the distinguished level of achievement.

To earn the distinguished level of achievement, students must complete an endorsement and Algebra II. The percentage of graduates who completed the distinguished level of achievement increased across the three cohorts, ranging from 81% for students entering Grade 9 in 2014–15 to 83% for the 2016–17 Grade 9 cohort (Exhibit 5).

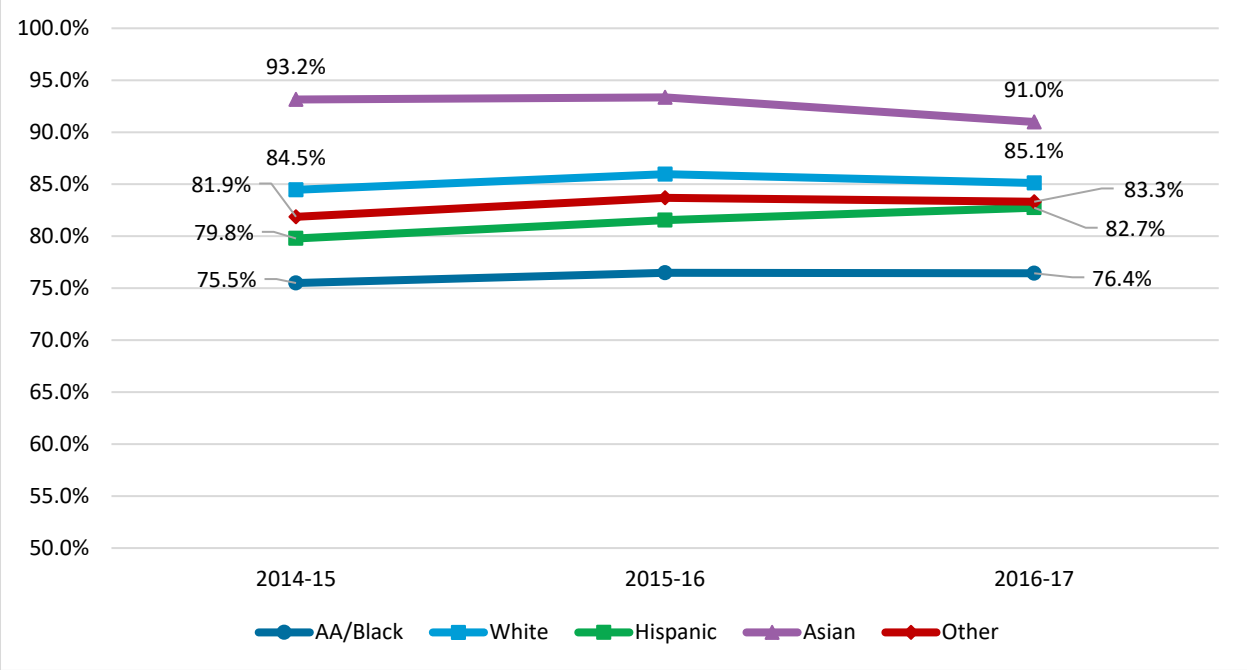
Exhibit 5. Percentage of Graduates in Each Cohort Who Earned the Distinguished Level of Achievement



Note. Graph based on authors' analysis of data described in Appendix A.

Although most students graduated with the distinguished level of achievement, achievement gaps were evident across student groups. Fewer African American graduates earned the distinguished level of achievement compared with graduates from other racial/ethnic groups. Although the rates remained fairly flat across the cohorts, Hispanic students had the largest increase across the three cohorts in the percentage of graduates who earned the distinguished level of achievement, increasing 3 percentage points from the 2014–15 cohort to the 2016–17 cohort (Exhibit 6). The percentage of Asian graduates who earned the distinguished level of achievement declined more than 2 percentage points from the 2014–15 cohort to the 2016–17 cohort.

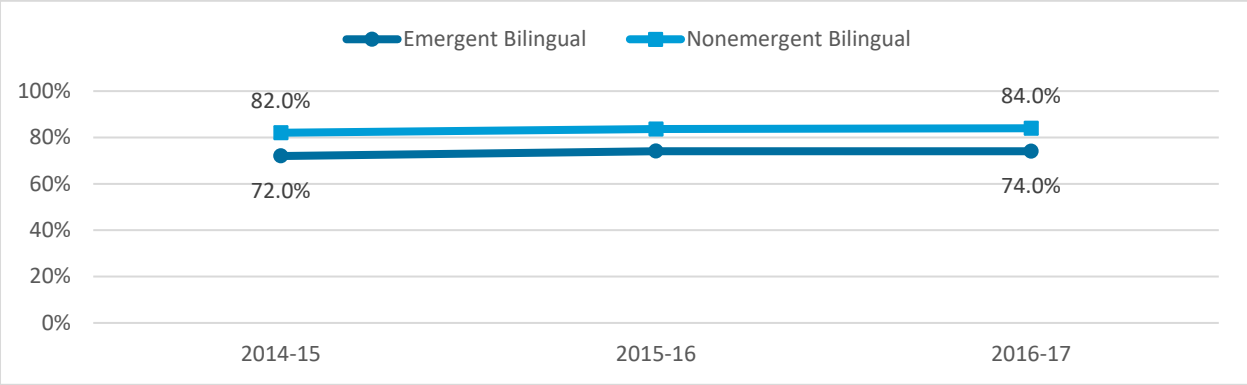
Exhibit 6. Percentage of Graduates in Each Cohort Who Earned the Distinguished Level of Achievement by Race/Ethnicity

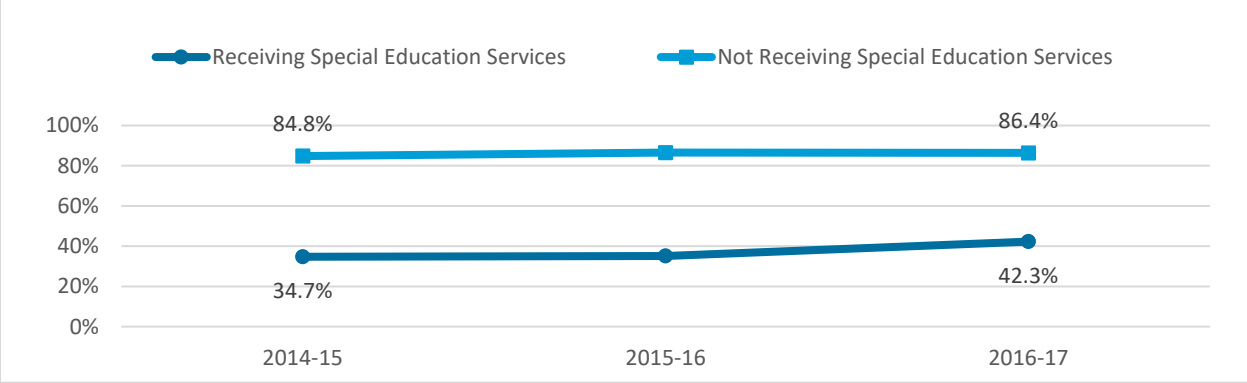


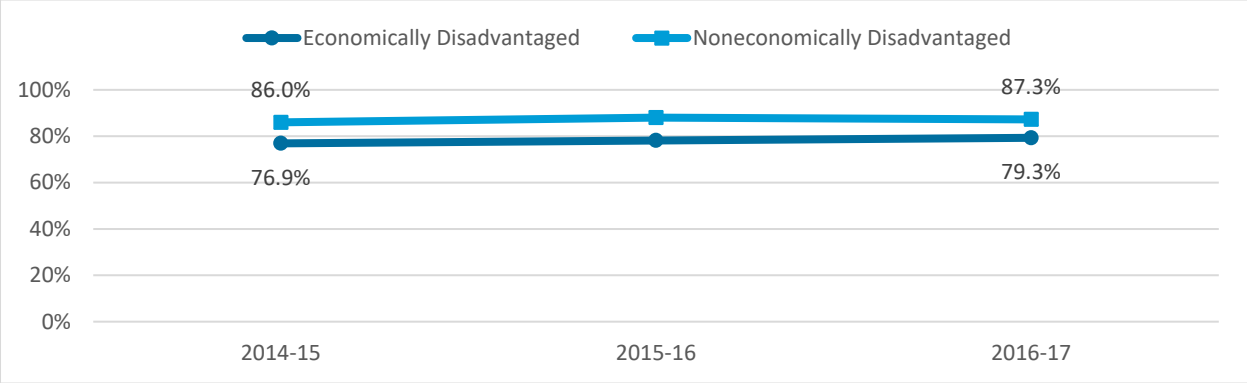
Note. AA = African American. Graph based on authors' analysis of data described in Appendix A.

Graduates who earned the distinguished level of achievement also varied by special student populations. The largest gap between graduates earning the distinguished level of achievement was between graduates receiving special education services and graduates not receiving special education services (Exhibit 7). However, the gap between graduates receiving special education services and not receiving special education services narrowed across time. The percentage of graduates receiving special education services who earned the distinguished level of achievement rose almost 8 percentage points between the first and third cohorts (Exhibit 7). This closing of gaps may be attributed to changes in the statute and state education agency rules. A student receiving special education services taking courses with modified curriculum was not eligible to graduate on the RHSP or DAP (19 TAC §89.1070). The student was only eligible to graduate on the MHSP. Under the Foundation High School Program, students receiving special education services may receive a modified curriculum and earn the distinguished level of achievement.

Exhibit 7. Percentage of Graduates in Each Cohort Who Earned the Distinguished Level of Achievement by Special Student Populations







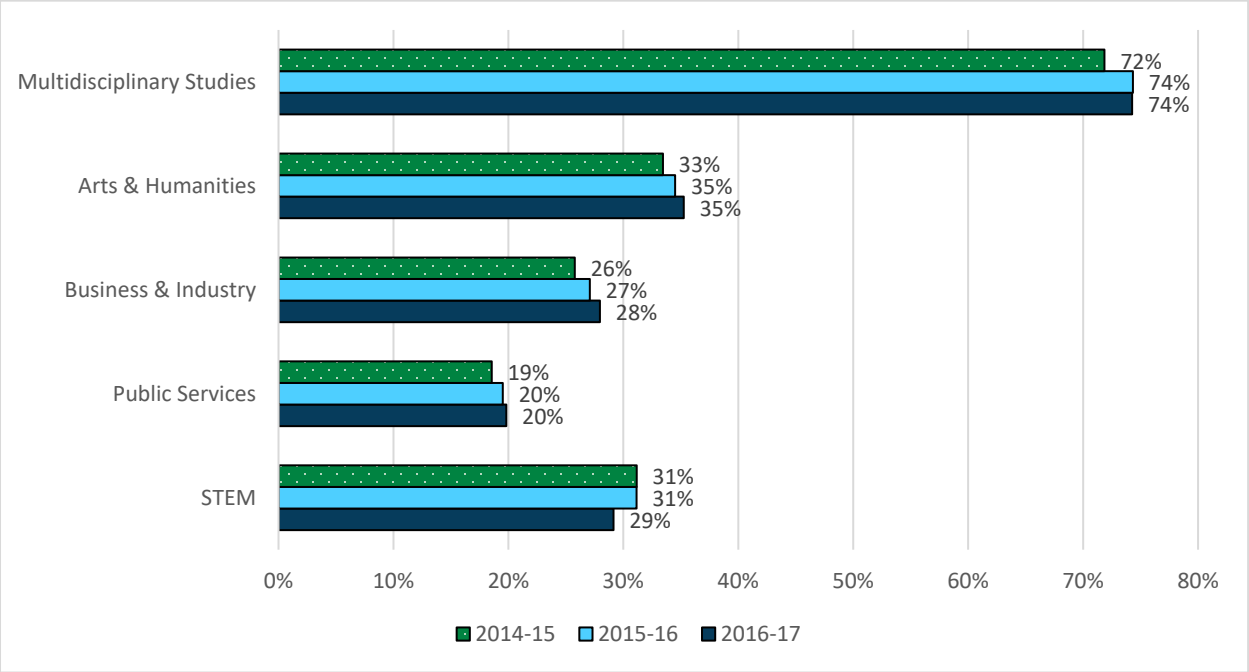
Note. Graphs based on authors' analysis of data described in Appendix A.

The percentage of graduates earning each endorsement varied, with more students completing Multidisciplinary Studies and fewer students completing Public Services.

Per the Foundation High School Program requirements, five endorsements are available to high school students. Districts can offer any number of endorsements; however, if districts

only offer one endorsement, they must offer Multidisciplinary Studies.[7] The percentage of graduates completing a Multidisciplinary Studies was the highest at more than 70% (Exhibit 8). Excluding Multidisciplinary Studies, STEM and Humanities had the largest percentage of graduates completing the endorsement. The percentage of graduates completing Public Services had the lowest percentage of graduates completing the endorsement. The distribution of endorsements earned by graduates changed very little across the first three cohorts to graduate under the Foundation High School Program.

Exhibit 8. Percentage of Graduates in Each Cohort Completing Each Endorsement



Note. Graph based on authors' analysis of data described in Appendix A.

Many graduates also earned Multidisciplinary Studies as a second endorsement in addition to one of the other four options. The percentage of graduates who completed Multidisciplinary Studies plus another endorsement ranged from 69% to 72%.

The percentage of graduates who earned each endorsement also varied by student characteristics. For the 2016–17 cohort, more female graduates than male graduates earned an endorsement in Arts and Humanities or Public Services, and more male graduates than female graduates earned an endorsement in Business and Industry. African American and Hispanic graduates were more likely to earn an Arts and Humanities or a Business and Industry endorsement than any other endorsement, aside from Multidisciplinary Studies.

[7] Per Texas Education Code § 28.025 (c-4).

Asian, White, and graduates from another race/ethnicity were more likely to earn an Arts and Humanities or STEM endorsement than any other endorsement, aside from Multidisciplinary Studies (Exhibit 9). Similar patterns occurred for special student populations. Graduates from special student populations were more likely to earn an Arts and Humanities or a Business and Industry endorsement, whereas their peers who did not participate in those programs were more likely to earn an Arts and Humanities or STEM endorsement (Exhibit 9).

Exhibit 9. Percentage of 2016–17 Graduates Earning Each Endorsement by Student Characteristics

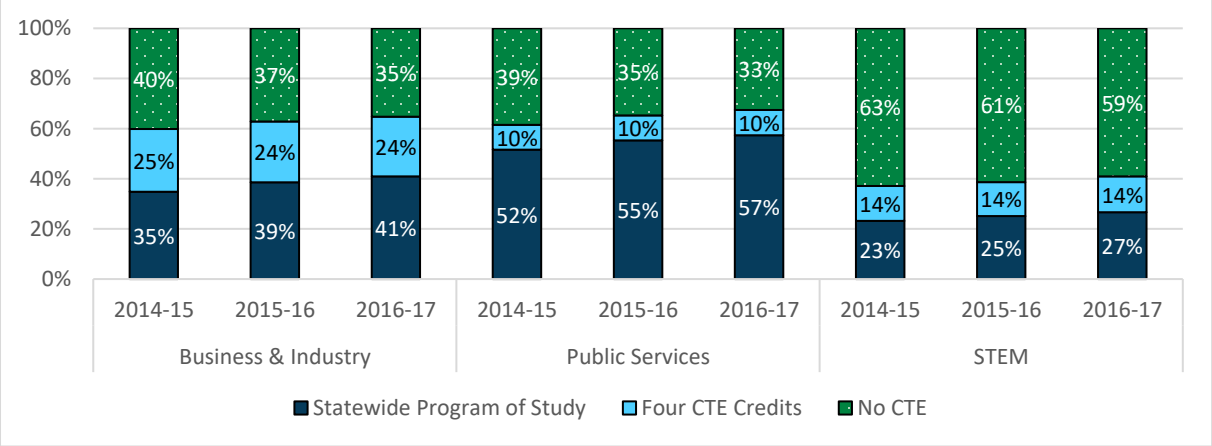
Student characteristics	Career endorsements				
	Arts & Humanities	Business & Industry	Public Services	STEM	Multidisciplinary Studies
2016–17 Entering Grade 9 Cohort Graduates (286,148)	**35%**	**28%**	**20%**	**29%**	**74%**
Gender					
Female (147,788)	41%	22%	27%	27%	75%
Male (138,360)	29%	35%	12%	31%	74%
Race/ethnicity					
African American (32,766)	26%	26%	19%	19%	72%
Asian (14,087)	50%	18%	18%	64%	84%
Hispanic (146,182)	35%	29%	23%	25%	73%
White (86,452)	37%	30%	15%	34%	76%
Other (6,661)	37%	25%	17%	32%	77%
Special student populations					
Economically disadvantaged (146,229)	32%	29%	22%	22%	71%
Noneconomically disadvantaged (139,919)	39%	26%	17%	37%	78%
Emergent bilingual (23,797)	30%	30%	19%	16%	72%
Nonemergent bilingual (262,351)	36%	28%	20%	30%	74%
Receiving special education (13,053)	25%	37%	18%	10%	66%
Not receiving special education (273,095)	36%	28%	20%	30%	75%

Note. Percentages sum to more than 100% because students can earn more than one endorsement. Table based on authors' analysis of data described in Appendix A.

The percentage of graduates completing an endorsement through a coherent sequence of CTE courses varied by endorsement.

To complete curriculum requirements for earning an endorsement, the Texas State Board of Education approved between two and five options that districts could offer for completing each endorsement. Three endorsements include a coherent sequence of CTE courses as options: Business and Industry, Public Services, and STEM. In 2019, TEA developed statewide CTE programs of study aligned with Perkins V, which went into effect for the 2020–21 school year (Strengthening Career and Technical Education for the 21st Century Act, 2018).[8] As a comparison for future cohorts, these approved statewide programs of study were retroactively applied to these graduating cohorts. More graduates completed an approved statewide CTE program of study under Public Services than Business and Industry or STEM (Exhibit 10). Depending on the endorsement, an additional 10% to 25% of graduates earned four or more credits in CTE coursework, which may have been a district-designed coherent sequence of courses before TEA developed the statewide programs of study.

Exhibit 10. Percentage of Graduates in Each Cohort Earning an Endorsement Through a Statewide CTE Program of Study



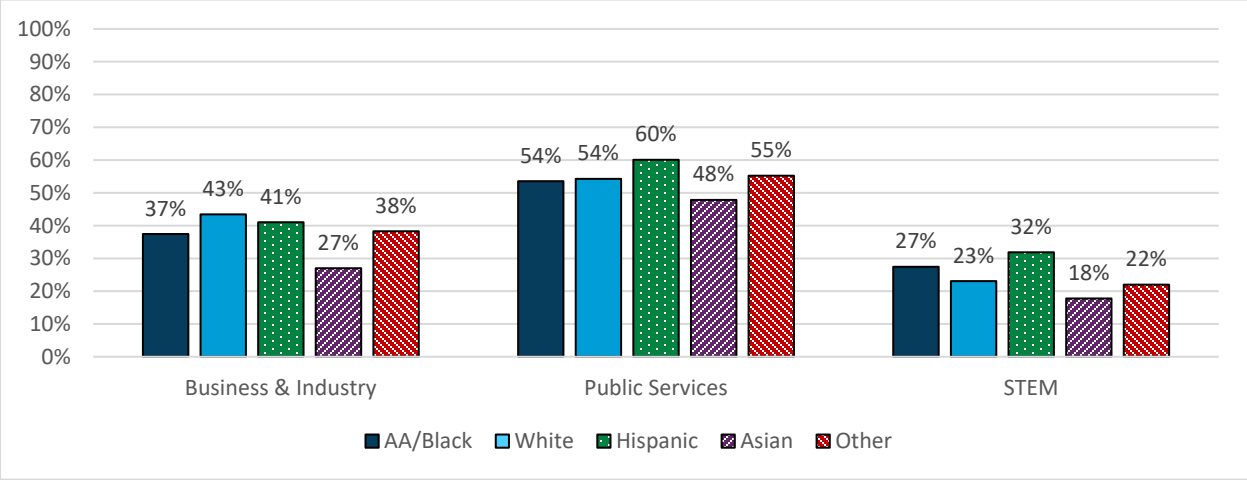
Note. CTE = career and technical education. Graph based on authors' analysis of data described in Appendix A.

The percentage of graduates who earned an endorsement through a statewide CTE program of study also varied by student characteristics. Hispanic graduates were more likely than students of other races/ethnicities to earn Public Services or STEM through a statewide CTE program. White students were more likely than students of other races/ethnicities to earn a Business and Industry endorsement through a statewide CTE program of study (Exhibit 11).

[8] To complete a program of study, students must complete three or more courses for four or more credits from the same program of study, with at least one course being a Level 3 or Level 4 course.

Asian students who earned these endorsements were less likely than all students to complete the endorsement through a statewide CTE program of study.

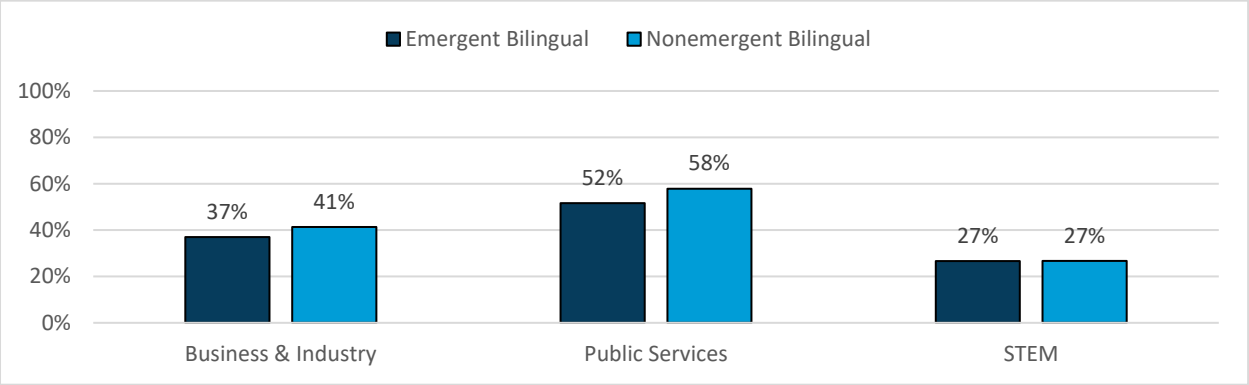
Exhibit 11. Percentage of Graduates From the 2016–17 Grade 9 Cohort Who Earned Each Endorsement Through a Statewide CTE Program of Study by Race/Ethnicity

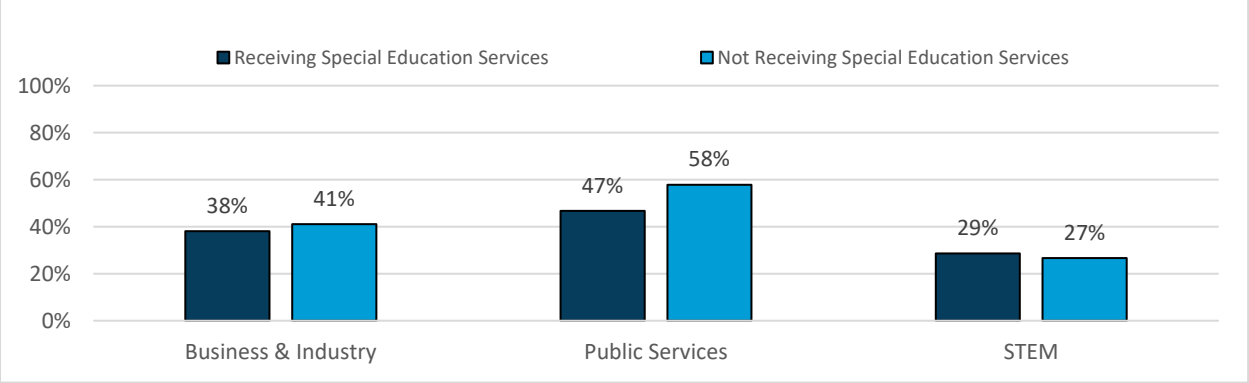


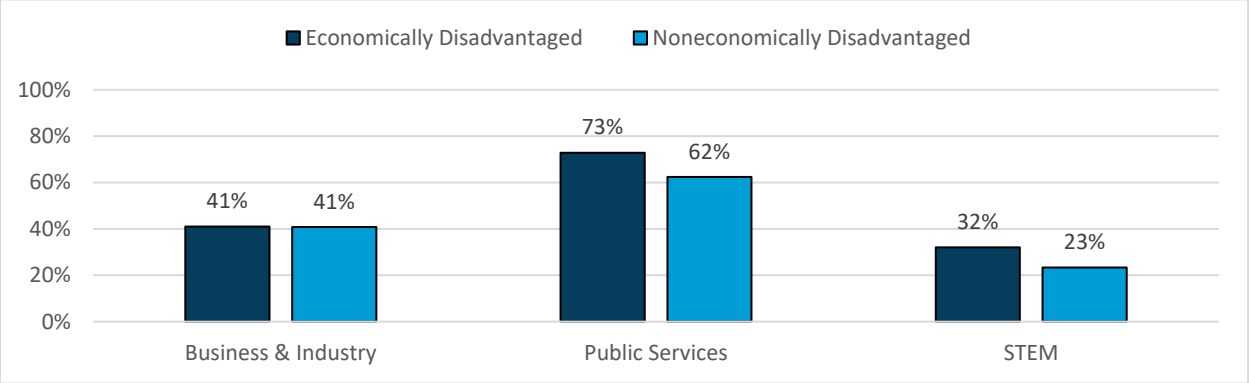
Note. AA = African American. Graph based on authors' analysis of data described in Appendix A.

The percentage of 2016–17 cohort graduates who earned an endorsement through a CTE program of study also varied by special student populations (Exhibit 12). Graduates from economically disadvantaged backgrounds were more likely to complete Public Services or STEM through a statewide CTE program of study than students from noneconomically disadvantaged backgrounds. The gap in earning STEM through a statewide CTE program of study between emergent bilingual graduates and their nonemergent bilingual peers was smaller than the gap for other student groups. Graduates receiving special education services had the largest gap in earning Public Services through a statewide CTE program of study compared with their peers not receiving special education services (Exhibit 12).

Exhibit 12. Percentage of Graduates From the 2016–17 Grade 9 Cohort Who Earned Each Endorsement Through a CTE Program of Study by Special Student Populations





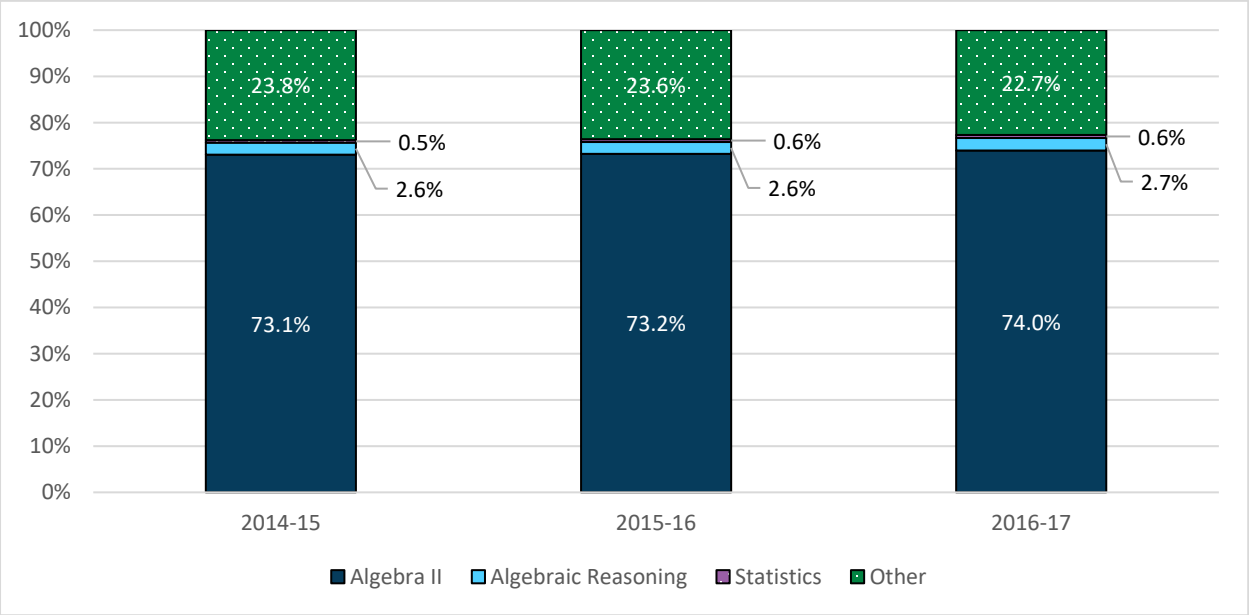


Note. Graphs based on authors' analysis of data described in Appendix A.

The Foundation High School Program enabled student choice for a third mathematics course; however, most students took Algebra II rather than other qualified mathematics courses.

More than 70% of the students in each cohort took Algebra II, and less than 3% of students completed one of the newly developed courses (Exhibit 13).

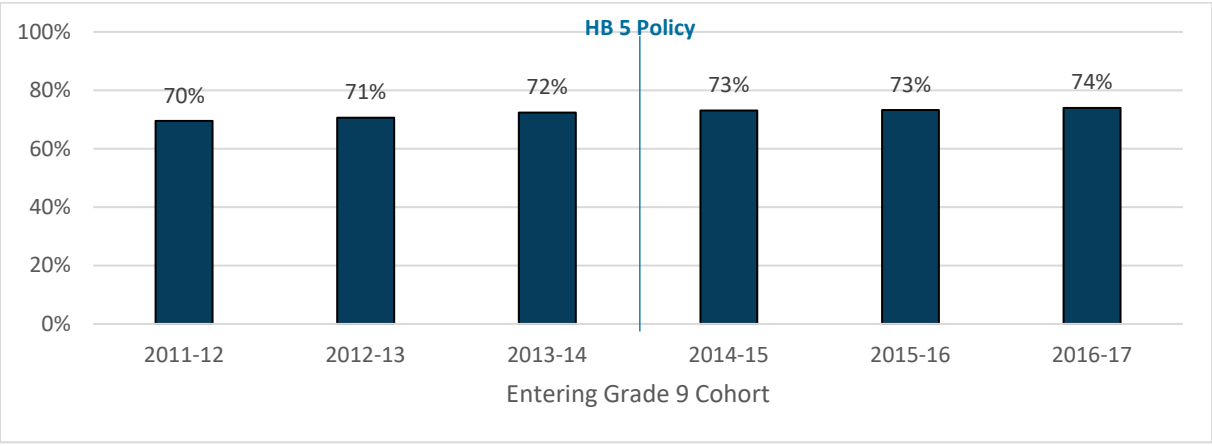
Exhibit 13. Percentage of Students Who Took Algebra II Versus Other Third Mathematics Courses by Grade 9 Cohort



Note. Graph based on authors' analysis of data described in Appendix A.

Changing Algebra II to an optional course was a significant change to the high school graduation requirements. Critics feared it would reduce the college and career readiness of graduates, yet Algebra II completion rates continued to increase after the policy. Using the entering Grade 9 cohorts from 2011–12 through 2013–14 as a comparison, the percentage of students who took Algebra II increased from 72% for the Grade 9 cohort entering high school before the policy to 74% for the 2016–17 Grade 9 cohort (Exhibit 14).

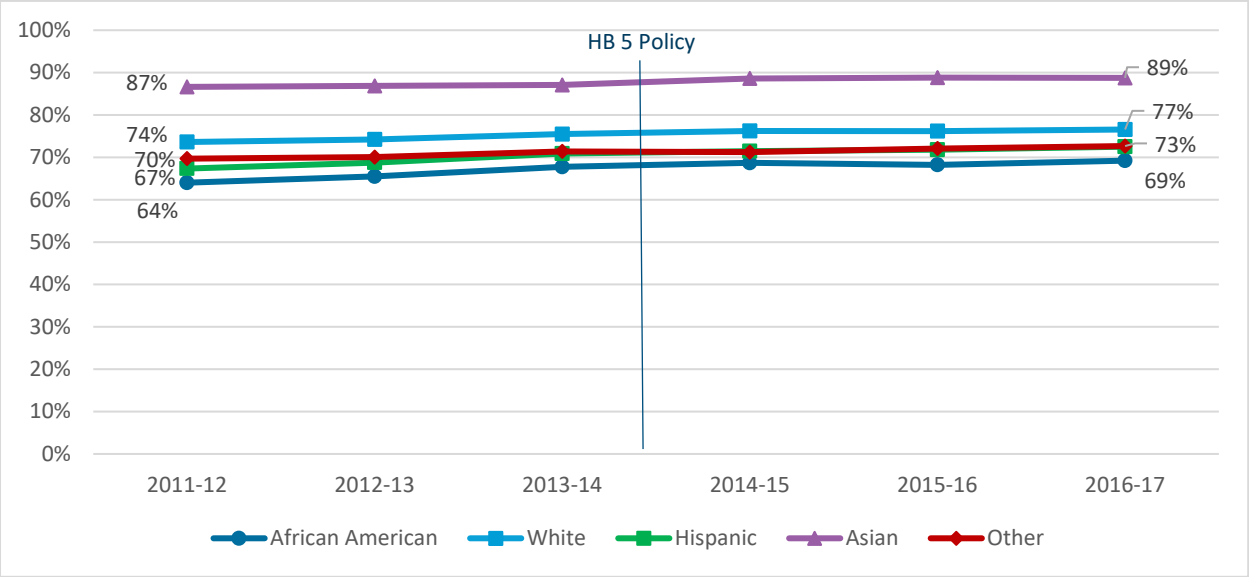
Exhibit 14. Percentage of Students Who Took Algebra II by Entering Grade 9 Cohort



Note. This exhibit shows the before and aftereffects of the enactment of HB 5. Graph based on authors' analysis of data described in Appendix A.

Gaps in taking Algebra II persisted by student race/ethnicity; however, rates increased slightly for all racial/ethnic groups following the policy and remained fairly stable across the cohorts (Exhibit 15).

Exhibit 15. Percentage of Students Who Took Algebra II by Entering Grade 9 Cohort and Race/Ethnicity



Note. This exhibit shows the before and aftereffects of the enactment of HB 5. Graph based on authors' analysis of data described in Appendix A.

Similar trends were evident with special student populations. The largest increase in Algebra II rates, after enactment of the policy, occurred among students receiving special education services. The percentage of students receiving special education services who took Algebra II rose almost 10 percentage points with the first cohort graduating under the Foundation High School Program and continued to increase across cohorts (Exhibit 16). This trend mirrors the trend seen with earning the distinguished level of achievement because Algebra II is a curriculum requirement for the distinguished level of achievement. As mentioned, one potential explanation for this dramatic increase is that under the previous graduation requirements, the Texas Administrative Code would not allow modified curriculum to count for courses required for the default graduation program, the RHSP, for special student populations (19 TAC §89.1070). Under the new graduation requirements, there was not a stipulation in law or rule that prevented modified curriculum for earning a distinguished level of achievement. In addition, under HB 165 during the 86th Texas Legislature, students receiving special educations services can earn an endorsement with modified curriculum, which may include the Algebra II course (Texas Legislative Council, 2019).

Exhibit 16. Percentage of Students Completing Algebra II by Entering Grade 9 Cohort and Special Student Populations

Note. This exhibit shows the before and aftereffects of the enactment of HB 5. Graph based on authors' analysis of data described in Appendix A.

Summary

The graduation requirements implemented under HB 5 were intended to provide students with greater flexibility in the courses required for graduation and the opportunity to focus on postsecondary education or training opportunities and career paths by completing an endorsement. For the first three cohorts graduating under the Foundation High School Program, we found the following:

- The percentage of students in each cohort who graduated from a Texas public high school within 4 years continued to increase with each cohort following the policy.
- More than 80% of the graduates earned the distinguished level of achievement because most students completed Algebra II, ensuring a competitive high school transcript and eligibility for top 10% automatic admissions to any Texas public university.
- Excluding Multidisciplinary Studies, Business and Industry and Arts and Humanities had the largest percentage of graduates completing the endorsements and remained fairly consistent across the first three cohorts. Fewer students earned STEM and Public Services.
- Although more than 70% of the graduates earned Multidisciplinary Studies, they did so in conjunction with another endorsement.
- Along with Business and Industry, STEM and Public Services have CTE coherent sequence of courses that align to the endorsements. More students earned Public Services by completing a statewide CTE program of study. Fewer students earned STEM by completing a statewide CTE program of study.
- Student inequities persisted under the Foundation High School Program. Gaps across student groups continued in the types of courses that students completed. The percentage of graduates who earned the distinguished level of achievement, driven by Algebra II completion, was lower for Black and Hispanic students versus White and Asian students. Race/ethnicity and special student population gaps remained in the percentage of graduates taking Algebra II before and after the change in graduation requirements.
- Although critics feared making Algebra II optional would reduce the number of students taking Algebra II, Algebra II completion rates continued to increase after the policy.
- Making Algebra II an optional course for the default high school program may have opened opportunities for special student populations to take Algebra II because they can now take Algebra II with curriculum modifications.

As part of the HB 5 legislation, TEA was required to conduct an evaluation that estimates the effects of these changes on several key student outcomes. The legislation directed the commissioner of education to submit an initial report to the Texas legislature no later than December 1, 2015, and a final report no later than December 1, 2017 (Mellor et al., 2017). However, the first cohort of students to graduate under the Foundation High School Program did not graduate until spring 2018. As a follow-up, aligned to the spirit of the law (HB 5 Section 83(a)), now that several cohorts of high school students have graduated under these more flexible high school course requirements, estimating the effects of these changes on students' outcomes is a judicious next step. In a separate report, we examined the implementation of the new graduation policy and the impact of the policy on student outcomes, including Algebra II completion, high school graduation rates, college readiness, readiness to enroll in freshman-level mathematics coursework, 2- and 4-year college enrollment, 2- and 4-year college persistence, and college degree and workforce certificate completion (Mellor et al. 2021; Mellor et al., Manuscript in preparation).

References

Holzman, B., & Lewis, B. (2020). *House Bill 5 and high school endorsements: How do they align to college admissions?* Rice University, Houston Education Research Consortium. https://files.eric.ed.gov/fulltext/ED611116.pdf

Mellor, L., Stoker, G., & Muhisani, H. (2017). *House Bill 5 evaluation: Final report*. American Institutes for Research. https://tea.texas.gov/sites/default/files/HB5-Final-Comprehensive-Report.pdf

Mellor, L., Stoker, G., & Quinn, S. (2021). *Progress implementing the Texas Foundation High School Program*. American Institutes for Research. https://www.air.org/sites/default/files/2022-02/Progress-Implementing-Texas-Foundation-High-School-Program-Brief-508-December-2021.pdf

Mellor, L., Joshi, M., Cain, M., & Semma, B. (Manuscript in preparation). *Evaluating Texas's high school pathways for college and career success*. American Institutes for Research.

Stoker, G., Mellor, L., & Sullivan, K. (2018). *Trends in Algebra II completion and failure rates for students entering Texas public high schools* (REL 2018–289). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. https://files.eric.ed.gov/fulltext/ED580929.pdf

Strengthening Career and Technical Education for the 21st Century Act (Perkins V), Pub. Law No. 115-224 (2018).

Texas Administrative Code, Title 19, Education, Ch. 74, Subchapter B, § 74.12. https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=T&app=9&p_dir=F&p_rloc=184675&p_tloc=14555&p_ploc=1&pg=2&p_tac=&ti=19&pt=2&ch=74&rl=12

Texas Administrative Code, Title 19, Education, Ch. 89, Subchapter AA, § 89.1070. https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=T&app=9&p_dir=N&p_rloc=170995&p_tloc=&p_ploc=1&pg=3&p_tac=&ti=19&pt=2&ch=89&rl=1056

Texas Education Agency. (2020a). *Graduation toolkit: Information for planning your high school years & beyond*. https://tea.texas.gov/about-tea/news-and-multimedia/brochures/graduationtoolkit2020-english-website.pdf

Texas Education Agency. (2020b). *Guidance for 2020 seniors*. https://tea.texas.gov/texas-schools/health-safety-discipline/covid/covid19-guidance-for-2020-seniors.pdf

Texas Education Agency. (2011). *Parent/guardian notification of benefits of the recommended high school program for graduation.* https://tea.texas.gov/system/files/Benefits_RHSP_0811.pdf

Texas Legislative Council. (2019). *Summary of enactments, 86th legislature, regular session*. Austin, TX. https://www.tlc.texas.gov/docs/sessions/86soe.pdf

Appendix A. Data and Methods

This appendix describes the data sources and analysis methods.

Data Sources

This study used high school student-level administrative records from TEA maintained in the state longitudinal database housed at the Education Research Center at the University of Texas at Austin. These administrative records included high school student enrollment information, demographic information (e.g., gender; race or ethnicity; and special student populations such as emergent bilingual, students receiving special education services, and students from economically disadvantaged backgrounds), as well as student academic data (e.g., state test scores, college readiness measures, course completion records, and high school graduation records, including graduation plan or program and the endorsement completed).

Methods

Methodology for Constructing Grade 9 Cohorts

All analyses were based on cohorts composed of incoming Grade 9 students for the specific academic year. For example, students who entered Grade 9 for the first time in fall 2014 were considered to be members of the 2014–15 cohort. Because the fall enrollment snapshot was used to identify first-time Grade 9 students, students entering later in the academic year were not included in the cohort or any of the analyses. Incoming Grade 9 students formed the base for each cohort and were followed forward for 6 years. The denominator for each student-level analysis was determined by the number of Grade 9 students included in each cohort. Students do not enter or exit a cohort for any reason, including dropout, transfer out of state, or transfer to a private school. The methods used to create these cohorts kept the number of students in a cohort consistent across time, which allowed for more consistent comparisons across cohorts and analyses.

Analytic Sample

The study used data on the population of first-time Grade 9 students who entered Texas public high schools during the 2011–12 through 2016–17 academic years. Students in the 2011–12 through 2013–14 cohorts entered high school under the previous graduation program (i.e., Minimum, Recommended, and Distinguished graduation plans), whereas students in the 2014–15 through 2016–17 cohorts entered high school under the Foundation High School Program. Exhibit A1 displays the descriptive statistics for all first-time Grade 9

cohorts used in the analytic sample. Students who graduated within 4 years of entering Grade 9 were considered high school graduates.

Exhibit A1. Number of Entering Grade 9 Students and Demographic Characteristics by Cohort

Demographic variable	Previous graduation requirements			Foundation High School Program		
	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17
Total Grade 9 students	361,624	368,558	374,960	389,516	398,248	399,449
Gender						
Male	51.2	51.3	51.1	51.2	51.2	51.3
Race/ethnicity						
African American	12.9	13.0	12.8	12.6	12.5	12.4
Asian	3.6	3.6	3.6	3.8	4.0	4.2
Hispanic	48.8	49.5	49.9	50.6	51.4	51.7
White	32.3	31.6	31.3	30.5	29.5	29.1
Other	2.2	2.2	2.2	2.3	2.3	2.4
Student group						
Economically disadvantaged	54.9	55.4	55.1	54.0	55.2	55.3
Emergent bilingual	7.2	7.4	7.8	9.0	10.0	10.9
Special education	9.0	8.8	8.5	8.4	8.7	8.8
School locale						
City	41.8	41.7	41.7	42.1	42.1	42.2
Rural	13.3	13.3	13.3	13.4	13.3	13.3
Suburb	33.9	34.1	34.6	34.6	34.6	35.0
Town	10.0	9.9	9.7	9.7	9.7	9.5

Analysis

To address each research question, the research team used descriptive statistics to examine the numbers and percentages of Texas high school graduates who completed each outcome of interest. To address each subresearch question, the research team calculated the numbers and percentages for the student groups of interest (based on gender, race/ethnicity, emergent bilingual status, economic disadvantaged background, and receiving special education services).

Student Outcomes

High School Graduation. Student-level graduation diploma type was used to calculate the percentage of students who graduated from high school within 4 years of entering Grade 9 and either completed the Foundation High School Program, the Foundation High School Program plus an endorsement, or the distinguished level of achievement.[9]

Endorsements. Students who completed a sequence of courses grouped together by interest or occupational skill earn one or more endorsements. Endorsements completed by students at graduation were used to calculate the number and percentage of graduates who completed each endorsement (i.e., Arts and Humanities, Business and Industry, Public Services, STEM, and Multidisciplinary Studies).

Endorsements Completed Through CTE. We examined the CTE courses that students completed in high school to determine the number and percentage of graduates who completed four credits in CTE or completed a statewide CTE program of study. Statewide CTE programs of study lead to endorsements in three career areas: Business and Industry, Public Services, and STEM. In 2019, TEA created statewide programs of study, which went into effect for the 2020–21 school year, to meet the federal program approval requirements within the Strengthening Career and Technical Education for the 21st Century Act [Perkins V (2018)] Prior to TEA developing statewide programs of study, districts were responsible for creating programs of study for their students. The statewide approved programs of study were retroactively applied to all cohorts and used to compare the number and percentage of students completing an endorsement through a CTE pathway across cohorts. In addition, we also examined the percentage of students taking four or more credits in CTE coursework because it may reflect completion in district-designed programs of study for those Grade 9 cohorts.

Algebra II Completion. Mathematics courses that students completed in high school were examined to determine the number and percentage of Grade 9 students who completed and received credit for Algebra II. Algebra II completion rates were examined for Grade 9 cohorts graduating under the previous graduation plan and the Foundation High School Program.

[9] The calculation of high school graduation uses a different methodology from that employed by TEA. The denominator for these analyses includes all students who entered the cohorts during the fall of Grade 9 to produce consistent estimates of graduation rates across time; whereas TEA's graduation rate calculations have changed over time in response to changes in policy.

Appendix B. Courses That Fulfill the Third Mathematics Course Requirement[10]

- Accounting II
- Advanced Placement Computer Science
- Advanced Placement or International Baccalaureate Mathematics Course
- Advanced Quantitative Reasoning
- Algebra II
- Algebraic Reasoning
- Applied Mathematics for Technical Professionals
- Digital Electronics
- Discrete Mathematics for Computer Science
- Discrete Mathematics for Problem Solving
- Engineering Mathematics
- Financial Mathematics
- Independent Study in Mathematics
- Manufacturing Engineering Technology II
- Mathematical Applications in Agriculture, Food, and Natural Resources
- Mathematical Models With Applications
- Mathematics for Medical Professionals
- Precalculus
- Robotics II
- Robotics Programming and Design
- Statistics
- Statistics and Business Decision Making
- After the successful completion of Algebra II, a mathematics course endorsed by an institution of higher education as a course for which the institution would award course credit or recognized as a prerequisite for a course for which the institution would award course credit.
- After the successful completion of Algebra I and Geometry, a locally developed mathematics course or other activity, including an apprenticeship or training hours needed to obtain an industry-recognized credential or certificate.

[10] Texas Administrative Code, § 74.12 (2017).

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**

23234_02/24-508