MEMORANDUM October 26, 2017

TO: Michael Love
Assistant Superintendent, Career Readiness

FROM: Carla Stevens
Assistant Superintendent, Research and Accountability

SUBJECT: **CAREER AND TECHNICAL EDUCATION REPORT, HISD, 2016–2017**

The Houston Independent School District (HISD) offers 16 Career and Technical Education (CTE) programs that meet high school graduation endorsement requirements. CTE programs offer a sequence of courses that provides students with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current and emerging professions. This report focuses on students who were enrolled in a coherent sequence of CTE courses as coded in the Public Education Information Management System (PEIMS) for 2015–2016 and 2016–2017 and their performance on the 2016 and 2017 STAAR End-of-Course examinations.

Key findings include:

- The number of HISD students enrolled in a coherent sequence of CTE courses increased by 2,531 (11.4%) for the 2016–2017 school year.
- Compared to their peers who were not enrolled in any CTE courses, a higher percentage of students enrolled in a coherent sequence of CTE courses met the Approaches Grade Level Standard on the 2017 State of Texas Assessments of Academic Readiness (STAAR) English II (62.4% vs. 59.9%), and U.S. History (89.2% vs. 88.6%) End-of-Course (EOC) examinations.
- Students enrolled in a coherent sequence of CTE courses had a passing rate of 79.7% on the industry certification assessment for the 2015–2016 school year. Data for 2016–2017 were not available.
- A higher proportion of students enrolled in a coherent sequence of CTE courses (89.4%) graduated in 2016 compared to their HISD peers across the district (77.9%). Further, the annual dropout rate among students enrolled in a coherent sequence of CTE courses (2.5%) was lower compared to their HISD peers, districtwide (4.5%).

Further distribution of this report is at your discretion. Should you have any questions, please contact me at 713-556-6700.

Carla J. Stevens CJS

Attachment

cc: Grenita Lathan
Rick Cruz

HOUSTON INDEPENDENT SCHOOL DISTRICT

RESEARCH

Educational Program Report

CAREER AND TECHNICAL EDUCATION: PREVALENCE, STUDENT PERFORMANCE, AND PROGRAM OUTCOMES, HISD, 2016–2017

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Career and Technical Education: Prevalence, Student Performance, and Program Outcomes, 2016–2017

Executive Summary

The Houston Independent School District (HISD) offers 16 Career and Technical Education (CTE) programs that meet high school graduation endorsement requirements. CTE programs offer a sequence of courses that provides students with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current and emerging professions (Texas Education Agency, 2107a). CTE programs enable students to graduate from high schools with skills, knowledge, and abilities required to meet the needs of a rapidly changing economy and the demands of the workplace (Saunders & Del Razo, 2014). HISD offers CTE programs and courses in the following seven areas (1) Agricultural programs; (2) Architecture, construction, manufacturing, and transportation programs; (3) Science, Technology, Engineering, and Mathematics (STEM) programs; (4) Communication and information technologies; (5) Business operations, management, and hospitality programs; (6) Human and social services; and (7) Health science programs. This is a report on CTE course enrollment among HISD students, analysis of CTE students' performance as well as CTE program outcomes for the 2016–2017 school year. For this report, CTE students were defined as students enrolled in a coherent sequence of CTE courses as coded in the Public Education Information Management System (PEIMS) for 2015–2016 and 2016–2017.

Highlights

- The number of HISD students enrolled in a coherent sequence of CTE courses increased by 2,531 (11.4%) for the 2016–2017 school year.

- Compared to their peers who were not enrolled in any CTE courses, a higher percentage of students enrolled in a coherent sequence of CTE courses met the Approaches Grade Level Standard on the 2017 State of Texas Assessments of Academic Readiness (STAAR) English II (62.4% vs. 59.9%), and U.S. History (89.2% vs. 88.6%) End-of-Course (EOC) examinations.

- The performance of CTE students in enrolled in non-sequenced courses exceeded that of students who were enrolled in coherent-sequence courses in all EOC subjects, except U.S. History.

- Students enrolled in a coherent sequence of CTE courses had a passing rate of 79.7% on the industry certification assessment for the 2015–2016 school year. Data for 2016–2017 were not available.

- A higher proportion of students enrolled in a coherent sequence of CTE courses (89.4%) graduated in 2016 compared to their HISD peers across the district (77.9%). Further, the annual dropout rate among students enrolled in a coherent sequence of CTE courses (2.5%) was lower compared to their HISD peers, districtwide (4.5%).

- Gifted and talented (G/T) identification was the strongest predictor of performance on the 2017 STAAR Algebra I, Biology, and English I EOC examinations for students enrolled in a coherent sequence of CTE courses. Limited English proficiency (LEP) was the strongest predictor of student performance on the STAAR English I and U.S. History EOC exams.

- Because CTE enrollment and completion are included in the Texas Education Agency's (TEA) postsecondary school readiness index for accountability purposes, graduates enrolled in a coherent-sequence of CTE courses (89.4%) were assumed to be college ready.

Recommendations

- Ensure that strategies continue to be in place to increase student enrollment in coherent sequences of CTE courses and to increase program completion because, based on the findings, students in these courses outperform their peers.

- Future studies should include students' experiences with enrollment in coherent sequences of CTE courses, and the portion of graduates who gain access into employment-related areas of study to determine the true impact of the CTE program.

- Given the better performance of students enrolled in coherent sequences of CTE courses, greater focus need to be placed on reversing the negative performance predictors for coherent sequences of CTE courses including economic disadvantaged, LEP, special education, and at-risk statuses.

Introduction

Section 29.185 of the Texas Education Code (TEC) makes provision for the offer of and instruction in career and technical education programs within school districts in the State of Texas (State of Texas, 2017). The statute provides for CTE programs that lead to a postsecondary education, that meet or exceed business and industry standards (see TEC 29.187).

Career and technical education (CTE) programs offer a sequence of courses that provides students with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current and emerging professions (Texas Education Agency, 2017a). CTE programs enable students to graduate from high school with skills, knowledge, and abilities required to meet the needs of a rapidly changing economy and demands of the work place (Saunders & Del Razo, 2014).

In writing about the best practices for academic integration into CTE, Williams (2014) identified as best practices the integration of academic concepts into CTE that prepares CTE learners for college, makes provision for intellectually-challenging studies in high-demand fields that emphasize the higher-level math, science literacy and problem-solving skills needed in further education and the work place. Best practices also involved parents and students in a guidance and advisement system that develops positive relationships to ensure completion of a CTE concentration with an approved sequence of at least four courses and an accelerated program of study (Williams, 2014). Students are to be provided with adult mentors who work with and assist them in goal setting, course selection, progress reviews, and pursuit of appropriate interventions (Williams, 2014).

There are 16 CTE programs of study that meet high school graduation endorsement requirements in the Houston Independent School District (HISD). HISD requires at least one of five endorsements to meet graduation requirements. Endorsements, also referred to as sequences, are related courses that are grouped together by content or skills set. These are grouped as (1) Agricultural programs; (2) Architecture, construction, manufacturing, and transportation programs; (3) Science, Technology, Engineering and Mathematics (STEM) programs; (4) Communication and information technologies; (5) Business operations, management, and hospitality programs; (6) Human and social services; and (7) Health science programs. Each program has a career pathway that provides a coherent, articulated sequence of rigorous CTE courses. Dual credit CTE courses can lead to associate degrees, baccalaureate degrees, and beyond. End-of-program industry-recognized certificates and/or licensures are available for most programs of study (HISD, 2016a). **Appendix A, Table A1, p. 21** identifies the 16 programs and the HISD schools where they were offered in 2016–2017, the certifications, and potential employment areas.

The purposes of this evaluation are to determine the prevalence of enrollment in a coherent sequence of CTE courses among HISD students, analyze the performance of students in these courses, and determine the performance outcomes of students enrolled in a coherent sequence of CTE courses compared to their non-CTE peers in HISD.

Literature Review

Studies related to CTE have focused on its role in students' academic performance, progress, and dropout (Bosick & Dalton, 2013); preparing students for the workplace (Stone III & Aliaga, 2005); college enrollment (DeLuca, Plank, & Estacion, 2006; Lekes, Bragg, Loeb, Oleksiw, Marszalek, Brooks-LaRaviere, Zhu, Kremoda, Akukwe, Lee, & Hood, 2007); performance and outcomes (Dietrich, Lichtenberger, &

Kamalludeen, 2016; Bragg & Ruud, 2007); and factors that promote motivation and academic engagement in CTE (Loera, Nakamoto, Oh, & Rueda, 2013; Lekes, et al., 2007).

Lekes, et al., (2007) studied two CTE transition programs in the state of Illinois to determine their impacts on students' outcomes. The mixed-method study investigated an Information Technology/Computer Information Sciences (IT/CIS) and a Health Alliance curricula involving 53 high schools associated with a large community college (Lekes, et al., 2007). Results showed that participation in CTE transition programs did not interfere with academic course taking. Students who participated in the CTE programs felt more prepared for transitioning to college and had greater feelings of confidence and satisfaction with their chosen careers and colleges. Students' ACT WorkKey scores were higher for CTE participants compared to their matched peers who did not participate in the Reading for Information subtest on the ACT WorkKey (Lekes, et al., 2007). More than 50 percent of CTE students transitoned from high school to one of the targeted community colleges compared to 30 percent for their non-CTE peers. CTE students felt more prepared than their counterparts for college and career transition according to follow-up surveys (Lekes, et al., 2007).

Bosick and Dalton (2013) examined the efficacy of CTE for assessing students' math learning and student dropout prevention. The results showed that when occupational courses comprised a larger percent of the total courses taken, students answered fewer math questions correctly, took relatively more occupational courses in the final two years of high school and had limited acquisition of advanced math skills and concepts. It also showed that Black and Asian students benefited more from occupational courses than White students did, and that dropouts and enrolled students earned similar numbers of occupational credits (Bosick & Dalton, 2013). The study also found a positive relationship between dropout and the cumulative number of occupational credits relative to academic credits that students took. The study concluded, however, that the dropout was mostly associated with preexisting differences between students who followed a CTE-focused curriculum and those who followed an academic-focused curriculum (Bosick & Dalton, 2013).

Phelps and Chan (2016) studied the optimization of the relationship between high school CTE dual credit and non-dual credit learners' course completion, college and labor market outcomes, and factors that influence these relationships. They found that dual credit learners had significantly better outcomes than non-dual credit CTE learners in terms of completion rates, second-year retention, and three-year graduation rates as well as earnings in 2012–2013. The study included 2,300 students from 20 high schools who completed dual credit courses between 2008 and 2010 in an Upper Midwest Wisconsin community. The study controlled for several high school and individual level factors using a hierarchical model of combined college and state K-12 data (Phelps & Chan, 2016).

When the CTE perceptions of gifted and talented and general students were compared based on their traditional high school experiences, CTE gifted and talented students appeared to have positive comments regarding teacher quality, access to materials, learning relevant content, and autonomy (Gentry, et al., 2007). Traditional school experiences were marked by lack of relevant content and meaningful applications of the content in high school courses. General students commented on the lack of quality teachers for making connections and the irrelevant learning experiences (Gentry, et al., 2007). The study involved nine of 20 center programs in which 54 students (six from each program) were selected. Two of six students were classified as talented based on their teacher assessment and the other four students were allocated to the general students' group (Gentry, et al., 2007).

A hierarchical generalized linear model was used to predict community college outcome attainment using a random sample of 7,805 direct community college entrants in the state of Illinois in 2003 (Deitrich, et al.,

2016). After controlling for various pre-college and environmental factors, community college students who participated in a high school CTE program were just as likely or more likely to attain all outcomes measures associated with the study compared to their general curriculum peers. While these students were less likely, compared with their college prep students, to transit to four-year colleges, they had greater odds in obtaining an associate degree or certificate (Deitrich, et al., 2016). High CTE participation among community college students appeared to be a viable option in increasing the number of individuals with quality post-secondary education (Deitrich, et al., 2016).

Alfeld and Bhattacharya (2012) studied CTE mature programs-of-study sites, nationally, to determine effective transition from secondary to postsecondary education or the workforce. Thirty-three percent of students in this study went on to attend a college, and when students transition to college, 45% stayed in the same programs of study they were in during high school. Eighty percent of students surveyed in this study agreed or strongly agreed that their programs of study made them focus on their studies, so they knew where they were headed (Alfeld & Bhattacharya, 2012). The mixed-method study involved one college and its feeder higher school. The result of students' interviews showed that they were positive about their experiences with the programs of study but they felt that they lacked career guidance (Alfeld & Bhattacharya, 2012).

Previous HISD evaluations of the CTE programs showed higher proportions of CTE graduates and Distinguished Achievement diploma recipients compared to their non-CTE graduate peers. They also showed higher percentages of CTE students who met standard on STAAR EOCs, and lower dropout rates among CTE students when compared to their HISD counterparts, districtwide (Houston ISD, 2016a; 2016b; 2017).

Method

This is an evaluation involving three groups of students: Students who participated in a non-coherent sequence of CTE courses, those who were enrolled in a coherent sequence of CTE courses and were on track to complete their program, and those who were not enrolled in any CTE courses during the 2016–2017 school year. HISD students enrolled in CTE courses were flagged in the Public Education Information Management System (PEIMS) and Chancery data warehouses. **Appendix B, Tables B1** and **B2**, pp. 24 and 25 provide details. Pertinent demographic data: gender, ethnicity and race, economic status, gifted and talented identification status, limited English proficiency (LEP), special education eligibility status, and at-risk status were extracted along with students' State of Texas Assessments of Academic Readiness (STAAR) End-of-Course (EOC) exam scores in a Microsoft Access database. Microsoft Access is a data management and querying software which is part of the Microsoft Office Software suite. The PEIMS and STAAR EOC exam data contain unique identifiers which were used to link the two data sets. The PEIMS data was collected in the fall 2016 and the STAAR EOC was taken in the spring 2017. This linkage, therefore, excluded students who were not enrolled in the district during the PEIMS fall snapshots, as well as students who exited the district prior to the STAAR EOC.

Non-CTE students were included in the study sample as comparison groups. For analytical purposes, students were assigned 0 if they were not enrolled in any CTE courses, 1 if they were enrolled in one course, and 2 if they were enrolled in a coherent sequence of CTE courses consistent with their identification/designation in PEIMS. This final group was the main focus of this evaluation. All students who had a STAAR EOC exam score on Algebra I, English I and II, Biology, or U.S. History on the first administration of the tests were included in the sample. STAAR is a state-mandated criterion reference test for measuring students' academic performance and achievement. Scores for retesters were not included in the 2016–2017 data.

Descriptive analyses were used to determine the comparative composition of the groups in the sample by gender, ethnicity or race, economic status, gifted and talented identification status, LEP, special education eligibility status, and at-risk status. Further analysis focused on CTE students who met STAAR standards based on scale scores (standardized raw scores, number of correct items on each test) students attained on these tests. The nomenclature for the 2016–2017 student standards are as follows:

1. Does not meet grade level
2. Approaches Grade Level Standard at the students' performance standard
3. Masters Grade Level

The passing scores on the STAAR EOC exam data are 2 and 3. A students who attained the Masters Grade Level standard, would also have attained Approaches Grade Level Standard.

Linear regression analyses were conducted on each of the STAAR EOC tests in this evaluation to predict student performance regressed on selected demographic and instructional factors - gender, ethnicity and race, economic status, gifted and talented identification status, limited English proficiency (LEP), special education, at-risk status, and enrollment in CTE using Stata version 14. Stata is a statistical software of the StataCorp LLC used to analyze quantitative data. The data met the conditions of homoscedasticity, normality, and collinearity using the Shapiro-Wilks test, the Normal Q-Q plot, and the Detrended Normal Q-Q plot, and missing data cases were treated to pairwise exclusions on the IBM Statistical Packages for Social Sciences (SPSS) software.

The study used CTE industry certification data from the HISD Chancery Ad Hoc data warehouse retrieved through Cognos - an IBM data management platform. Graduation data from the Research and Accountability Microsoft Access data files and CTE and HISD longitudinal graduation rates obtained from TEA (2016) Accountability Completion, Graduation, and Dropout Summary Report were also used. The study used, as well, the TEA Performance Based Monitoring Analysis System 2016 Report for the descriptive comparison of the performance outcomes of CTE students and HISD students, districtwide.

Limitations

- STAAR EOC tests are administered at the completion of the respective course, although there are retesters, and so progress measures cannot be determined. As a result, more robust analyses, including program effects, could not be conducted. In addition, students self-selected into the CTE programs, making it a challenge to find a comparable group that did not enroll in CTE programs but with similar propensity for enrollment.

- CTE courses are designed to prepare students for college and careers. College enrollment or career decision data were not available as legitimate outcomes from which to measure the effectiveness of CTE course enrollment. However, CTE enrollment and enrollment completion are used as measures of postsecondary school readiness as part of Texas Education Agency (TEA) school accountability system and is being treated in this report as a proxy along with graduation data to assume program impact.

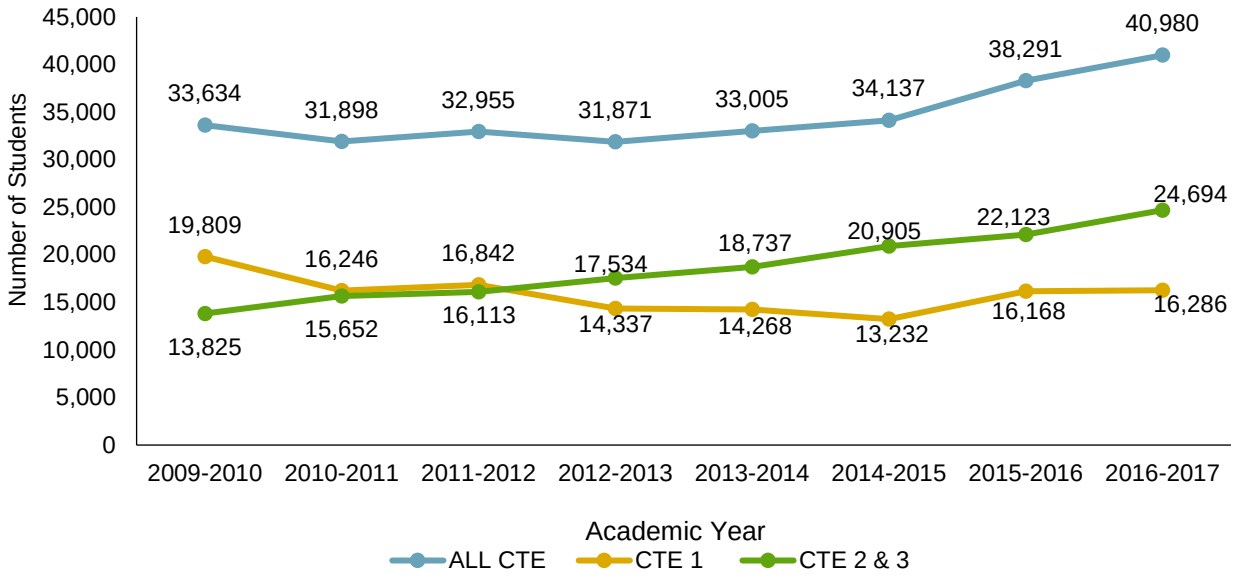
- CTE is not an intervention in traditional academic programs. The use of STAAR results, therefore, does not reflect the true outcome of CTE and limits the ability to determine the true impact of CTE.

Results

What were the enrollment trends and demographic characteristics of students enrolled in HISD CTE programs from 2009–2010 through 2016-2017?

Figure 1 displays CTE enrollment data from 2009–2010 through 2016–2017. CTE program codes are shown in Appendix B, Table B1, p. 20**.**

Figure 1. Enrollment Trends by CTE Code, 2009–2010 through 2016–2017



Source: PEIMS fall 2016 (Department of Research and Accountability database); HISD Report 2015–2016.
Note: CTE flags were revised in 2016–2017 to 0, 1 and 2 (See Appendix B, Table B2, p. 24); Figures for 2016–2017 reflect only Code 2. The use of code 3 has been discontinued.

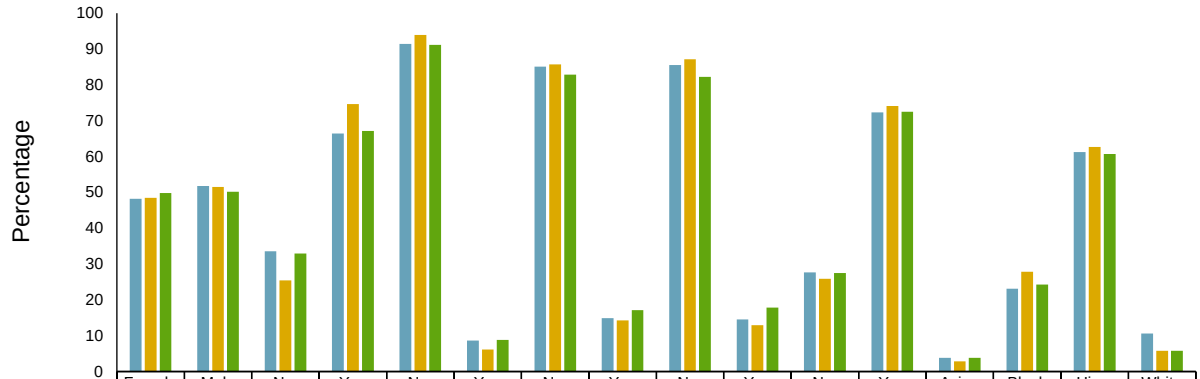
- Overall, the number of all HISD CTE students increased by 21.8 percent over the eight-year period under review, while the number of students enrolled in a coherent sequence of CTE courses (CTE 2 & 3) increased by 78.6 percent.

- There was an 11.4 percent increase in the number of CTE students enrolled in HISD from 2015–2016 to 2016–2017 school year.

- The number of students enrolled in one or no coherent sequence of CTE courses (CTE 1) decreased by 17.8 percent during the period under review.

Figure 2 displays the comparative distribution of students enrolled in CTE courses for HISD sixth through twelfth-grade students. The chart disaggregates students who were in CTE non-sequenced and sequenced courses.

Figure 2. Comparative Distribution of CTE and HISD 6-12th Grade Students by Demographic Groups, 2016–2017



	Female	Male	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Asian	Black	Hisp.	White
	Gender		At Risk		SpEd		G/T		LEP		Econ Disadv.		Ethnicity			
CTE Non-Seq. Courses	48.2	51.8	33.6	66.4	91.4	8.6	85.1	14.9	85.5	14.5	27.7	72.3	3.8	23.1	61.2	10.6
CTE Seq. Courses	48.5	51.5	25.4	74.6	93.9	6.1	85.7	14.3	87.1	12.9	25.9	74.1	2.8	27.8	62.7	5.8
HISD (6-12th Grade)	49.8	50.2	32.9	67.1	91.2	8.8	82.9	17.1	82.2	17.8	27.5	72.5	3.8	24.3	60.7	5.8

Source: PEIMS Fall 2016 (Department of Research and Accountability Access Database
Note: Seq. = Sequenced; Hisp. = Hispanic; SpEd = Special Education; G/T = Gifted and talented; the total CTE Enrollment was N = 24,694 and HISD 6th – 12th grade was 95,378

- A slightly higher proportion of boys compared to girls in the overall HISD 6th- through 12th- grade student population were enrolled in CTE courses during the 2016–2017 school year.

- A higher proportion of at-risk (74.6%) and economically-disadvantaged (74.1%) students were enrolled in CTE coherent sequence courses compared to the proportion of their peers in non-sequenced CTE courses and in the overall HISD student population for 2016–2017.

- Most students enrolled in a coherent sequence of CTE courses were either Black (27.8%) or Hispanic (62.7%). The proportion of both groups enrolled in a coherent sequence of CTE courses were higher than the proportion of their ethnic peers in the general HISD student population during the 2016–2017 school year.

What were key CTE program initiatives implemented in HISD during the 2016–2017 academic year?

Under the umbrella of the Career Readiness department, HISD provided career awareness and technical education experiences to students in the 2016–2017 school year. Some key initiatives included: Broadening Work-Based Learning Opportunities through Business Partnerships, Providing Career Awareness to Elementary Students, Increasing Career Exploration Experiences for Middle School Students, and Providing Print and Online Resources for Students and their Families.

In addition to these key initiatives, the Career Readiness department offered a variety of programs through Career and Technical Education (CTE) coursework from which students could select a career pathway of study. Career pathways guide students in course selection regardless of their abilities, talents, or desired levels of education. By taking CTE courses, students are given opportunities to participate in hands-on

training within their career pathway of interest. As such, HISD students engage in opportunities to explore career options and prepare for the workforce and/or post-secondary education. Additionally, several campuses offered dual credit courses to enhance their CTE pathways. The initiatives ensure that all CTE students develop career awareness within their selected course of study and receive exposure to professional experiences to develop mastery, confidence, and leadership skills. The following provides additional details regarding key initiatives in Career Readiness:

Broadening Work-Based Learning Opportunities through Business Partnerships:
Business partnerships provide students with enriching learning experiences, including one-on-one mentoring and real-world work opportunities. CTE students are invited to participate in field trips, site visits, and internships at local businesses. These businesses recognize the need to expose local students to various aspects of the world of work and the importance of on-the-job training experiences. Such experiences in 2016–2017 included serving as interns at Texas Children's Hospital and Methodist Hospital and job shadowing at the Houston Emergency Center. HISD business partners, including Vaughn Construction, S&B Engineers, Lone Star College, Walmart, CVS Pharmacy, Exxon, Houston Community College, Kroger, Mustang CAT, Baker Hughes, and International Trucks of Houston continue to partner with district high schools to provide assistance such as paid and unpaid internships for students, classroom speakers, facility tours, teacher externships, and financial and human capital support for the annual When I Grow Up Career EXPO, hosted by the Career Readiness department.

Providing Career Awareness to Elementary Students:
HISD elementary school students are exposed to career exploration presentations to increase their career awareness and peak interest in various careers within the local labor market. The Career Cowboy provides students with interactive, music-filled demonstrations with information about various professions. Students also participate in activity stations and hands-on demonstrations that help them begin to develop connections between their skills, interests, and future career choices. In 2016–2017 year, the Career Cowboy visited 34 Elementary Schools and engaged 11,891students in the Career Ready Wagon, a converted school bus filled with hands-on interactive stations in career exploration. Since 2012, the Career Ready Wagon program has exposed 46,315 students to career awareness activities.

Increasing Career Exploration Experiences for Middle School Students:
In 2016–2017, HISD increased middle school enrollment to 2,784 in three hybrid courses: Professional Communications, Principles of Information Technology, and Concepts of Engineering. The courses are designed to provide high school level credit in Information Technology or Engineering, while at the same time providing a specific curriculum that allows students to explore their own interests and aptitude as related to careers. Students are then able to make more informed decisions about their high school and endorsement choices.

Providing Print and Online Resources for Students and their Families:
The Career Readiness Department maintains an engaging and up-to-date online platform (website) and provides printed and online career program materials (Career Program booklet) to better inform students, parents, teachers, and business partners about career programming throughout the district. The website presence is audience driven and targets three audience groups through key functions: PLAN (Students and Families), PREPARE (Teachers), and Partner (Businesses). The site can be visited at the following link: http://www.hisdcareerreadiness.org. Information regarding descriptions of Career and Technical Education Programs of study available can be found at the following link:
http://www.hisdcareerreadiness.org/plan/programs/

When I Grow Up Career EXPO

During the 2016–2017 school year, the Career Readiness department held the fifth annual When I Grow Up Career EXPO to allow area students to explore career options and develop an awareness of the career opportunities available to them in Houston and Gulf Coast region. The free event included hands-on demonstrations, interactive presentations, and student competitions and was open to all K-12 students, parents, and the local community at large. The accomplishments of district CTE students were showcased as well as business and industry career opportunities available in the Houston and Gulf Coast region. Over 90 businesses and approximately 5,000 people attended the 2016–2017 event.

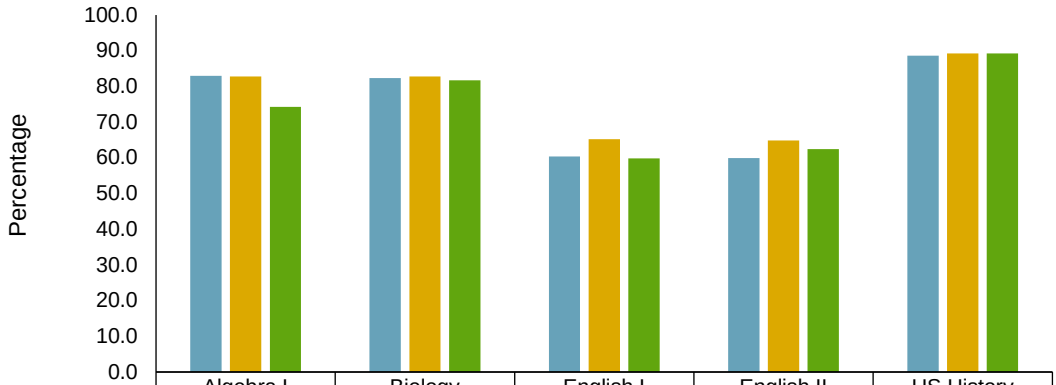
Career and Technology Student Organizations (CTSO)

CTE students are encouraged to join student organizations that are directly related to their selected career pathway. These organizations offer students opportunities to develop leadership and teamwork skills that help prepare them for the workforce and/or for postsecondary education and training. HISD has developed several partnerships with local, regional, and national professional organizations to allow school-level student organizations to participate fully in related activities of these organizations and to benefit from their professional memberships. Some of these organizations include the Business Professionals of America (BPA), Future Business Leaders of America (FBLA), Family, Career and Community Leaders of America (FCCLA), Health Occupations Students of America (HOSA), Skills USA, and the Technology Student Association (TSA). In the 2016–2017 school year, 4,376 students participated in district CTE student organization activities.

How did the performance of students enrolled in a coherent sequence of CTE courses compare with their HISD peers on the 2017 STAAR EOC assessments?

Figure 3 shows the comparative proportion of HISD non-CTE and students enrolled in a non-sequenced CTE course or a coherent sequence of CTE courses who met the Approaches Grade Level standard on the 2017 STAAR End-of-Course (EOC) tests.

Figure 3. Comparative Percentage of HISD Non-CTE and CTE students Who Met or Surpassed Approaches Grade Level Standard for 9th through 12th grade, STAAR EOC Exam, 2016–2017



	Algebra I	Biology	English I	English II	US History
Non-CTE	83.0	82.3	60.4	59.9	88.6
CTE Non-Sequenced Courses	82.8	82.8	65.2	64.9	89.2
CTE Sequenced Courses	74.3	81.7	59.8	62.4	89.2

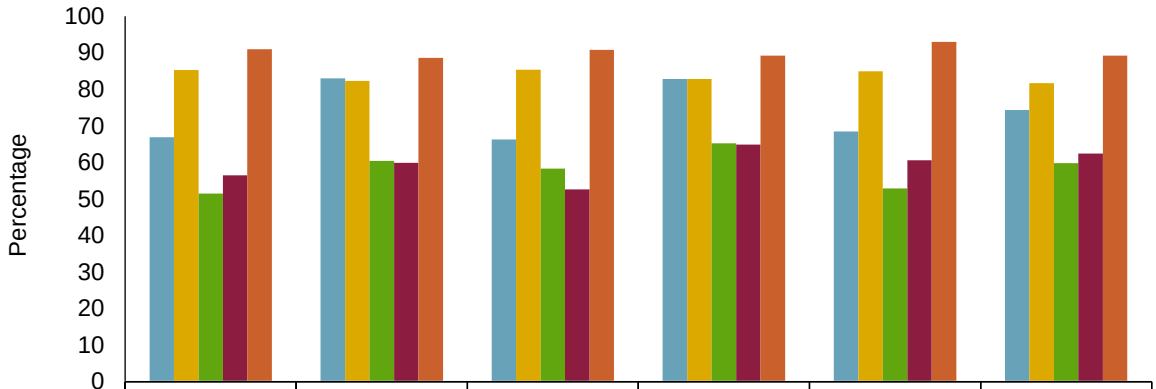
Source: HISD Student 2016–2017 PEIMS (Department of Research and Accountability Access database): STAAR EOC Spring Test Files, 2016–2017.
Note: Data is based on first-time testers.

- The proportion of students who met Approaches Grade Level standard on all the 2017 STAAR EOC subject assessments was lower for those enrolled in any coherent sequence of CTE courses except English II and U.S. History compared to those who were not enrolled in any CTE courses. The data are shown in Figure 3.

- Figure 3 shows a higher proportion of students enrolled in a non-sequenced CTE courses met the Approaches Grade Level standard on the 2017 STAAR Biology, English I, English II EOC, and similar for U.S. History EOC assessments compared to students who were enrolled in a coherent sequence of CTE courses.

Figure 4 shows the proportional distribution of students who met Approaches Grade Level standard by STAAR EOC subjects and study groups. **Table C1** in **Appendix C**, p. 26 provide the corresponding number of students tested.

Figure 4. Percentage of HISD 9th- through 12th-Grade Students in Non-CTE, Coherent Sequence of CTE, and Non-Sequenced Courses Who Met Approaches Grade Level Standards on the 2016 and 2017 STAAR EOC Assessments



	Non-CTE		CTE Non-Sequenced Courses		CTE Sequenced Courses	
	2016	2017	2016	2017	2016	2017
Algebra I	66.9	83.0	66.3	82.8	68.5	74.3
Biology	85.3	82.3	85.4	82.8	84.9	81.7
English I	51.5	60.4	58.3	65.2	52.9	59.8
English II	56.5	59.9	52.6	64.9	60.6	62.4
US History	91.0	88.6	90.8	89.2	93.0	89.2

Source: HISD PEIMS (Department of Research and Accountability) Access Database, 2015 and 2016 and STAAR EOC assessment results data files, 2016 & 2017.
Note: 2016 data include first-time testers and retesters, for 2016, Data was based on the 2016 STAAR EOC Assessments Level II Student Standards and the 2017 Approaches Grade Level Standard.

- Compared to 2016, a higher proportion of students in all evaluation groups met the Approaches Grade Level standard on 2017 STAAR Algebra I, English I, and English II EOC exams.

- The proportion of students who met Approaches Grade Level standard between 2016 and 2017 decreased for STAAR Biology and U.S. History EOC among all evaluation groups.

- A higher proportion of students enrolled in a coherent sequence of CTE courses met the 2017 Approaches Grade Level Standard on the STAAR Algebra I (74.3%), English I (59.8%), and English II

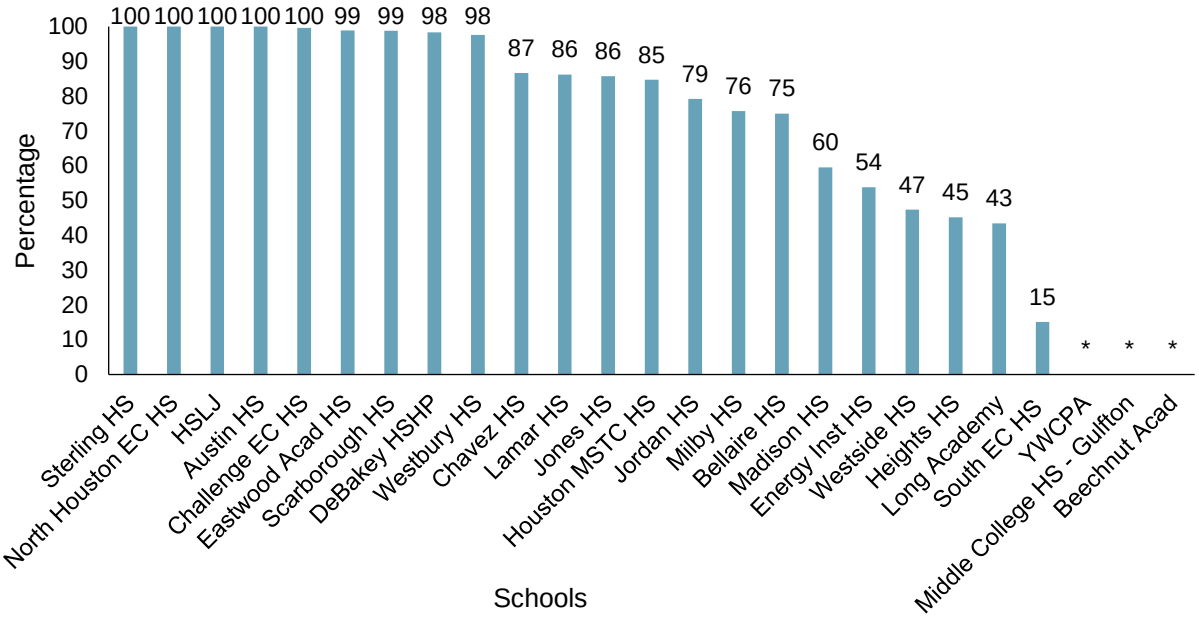
(62.4%) EOC assessments compared to their 2016 coherent sequence CTE peers who met standard at 68.5 percent, 52.9 percent, and 60.6 percent, respectively.

CTE Student Certification

Students could receive an industry certification, license or Occupational Competency Assessment on successful completion of their CTE courses or programs. **Appendix D**, p. 27 describes the certifications. Students can also earn a performance acknowledgement on their high school diplomas for earning a nationally or internationally recognized business or industry certification or licensure (Houston ISD, 2017).

Data provided by the Career Readiness Department showed that 5,769 CTE certifications were earned among students in 25 HISD schools. **Table D1** (p. 28) shows the type and distribution of certificates by schools. Of these, 79.7 percent were certification passes in 2015–2016. **Figure 5** shows the distribution of these certificates by school for students enrolled in the HISD CTE courses. Data for the 2016–2017 school year was not available.

Figure 5. Distribution of Certifications Among HISD CTE Students by School, 2015–2016



Note: *Less than five students tested

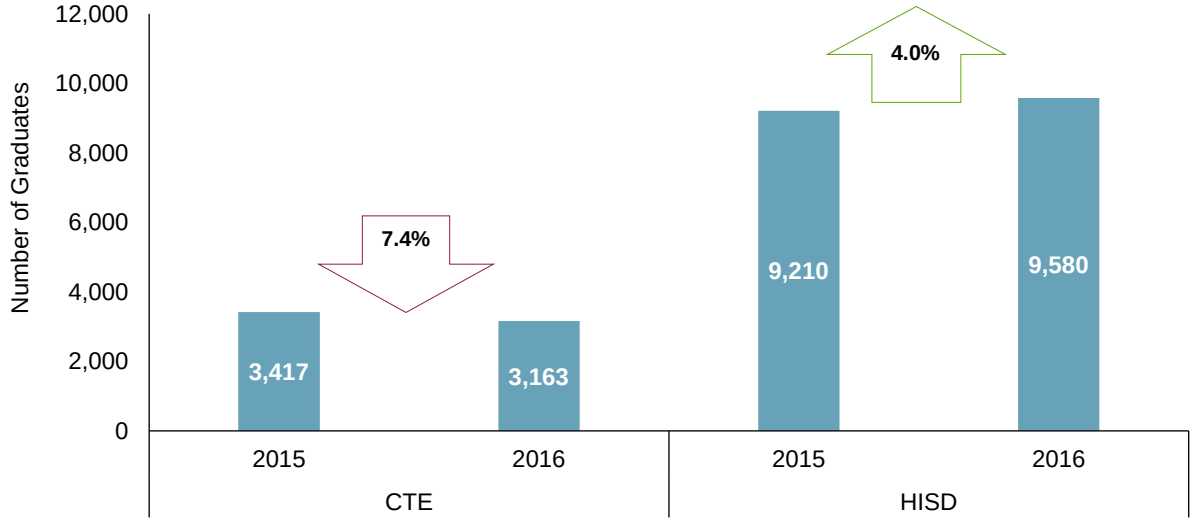
- According to Figure 5, nine CTE schools had certification pass rates of between 98 and 100 percent.
- Seven schools had certification pass rates between 75 and 97 percent, while two had between 50 and 74 percent.

What were the longitudinal graduation and annual dropout rates for students enrolled in a coherent sequence of CTE courses compared to HISD students, districtwide, Class of 2015 and Class of 2016?

Longitudinal graduation rates

The longitudinal graduation rates are the proportion of students from a cohort of first-time ninth-grade students who completed their high school education by the anticipated graduation year. **Figures 6** and **7** show the four-year longitudinal graduation rates by number and percentage of CTE students and all HISD students for 2015 and 2016. Graduation rates have a one-year lag before publication. The CTE data does not include students who were not enrolled in a coherent sequence of CTE courses.

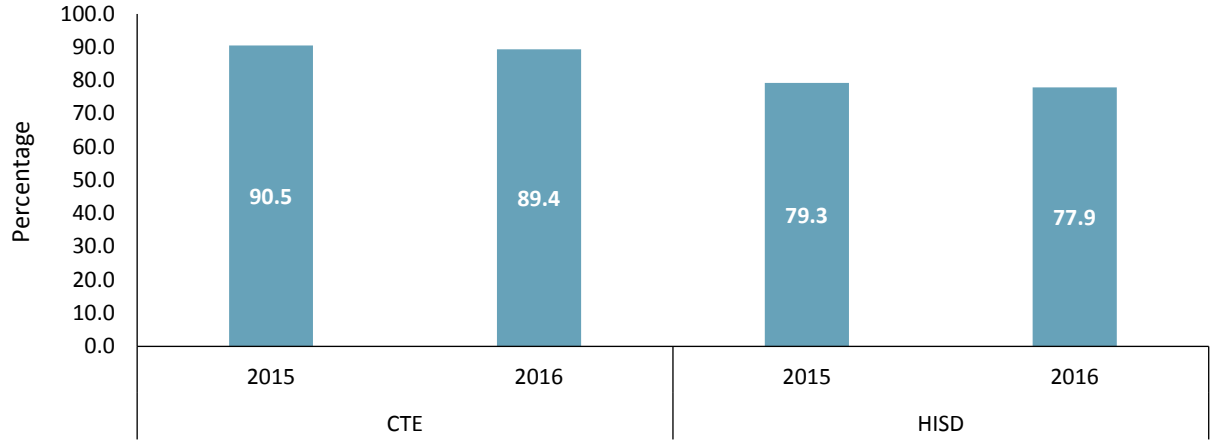
Figure 6. CTE and HISD Longitudinal Graduates Counts Based on the Class of 2015 and Class of 2016



Source: TEA 2015 and Class of 2016 Four-Year Longitudinal Summary Report.
Note: No statutory exclusions were applied. Data align to State Performance Based Monitoring Analysis System.

- The number of CTE students in a course-sequenced program who graduated from HISD in 2016 declined by 7.4 percent from 3,417 in 2015 to 3,163 in 2016. The number of HISD students graduating from the same cohort increased by 4.0 percent from 9,219 to 9,580.

Figure 7. CTE and HISD Longitudinal Graduation Rates Based on the 2015 and 2016 Ninth-Grade Class Cohorts



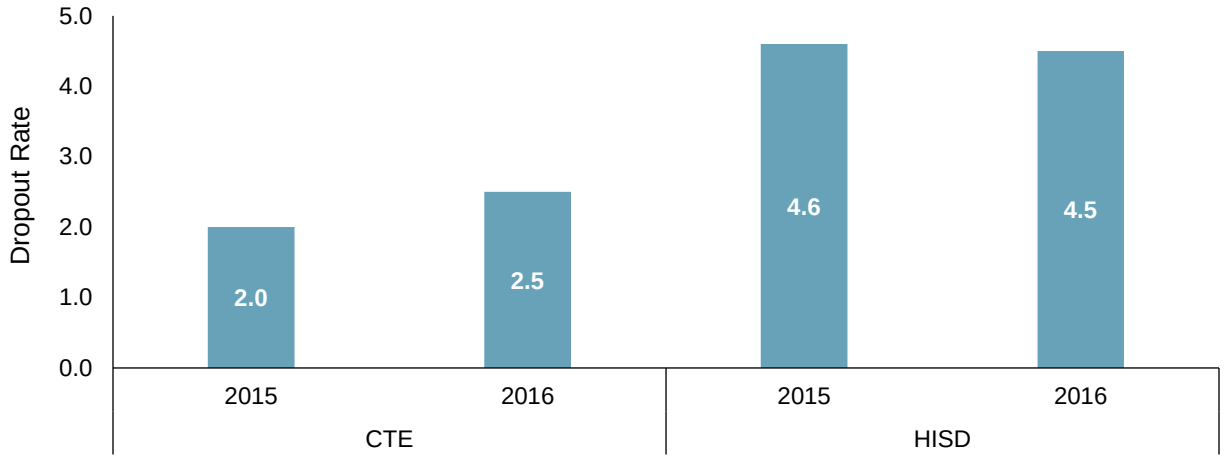
Source: TEA Class of 2015 and TEA 2016 Four year longitudinal Summary Report
Note: No statutory exclusions were applied. Data align to State Performance Based Monitoring Analysis System.

- For both the Class of 2015 and Class of 2016, a higher proportion of CTE students graduated compared to the graduation rates for students in the overall HISD population for the corresponding period.
- The percentage of CTE students who graduated from among the HISD Class of 2016 was 89.4 percent compared to 90.5 percent for the Class of 2015 students.
- The overall percentage of HISD Class of 2016 students who graduated (77.9%) was lower than those who graduated from the Class of 2015 (79.3%) students, using rates calculated for federal accountability purposes.

Annual Dropout

A dropout is a seventh- through twelfth-grade public school student, in a particular year, who does not return the following fall, and who has not been expelled, has not graduated, has not received a General Educational Development (GED) certificate, has not continued school outside the public-school system, had not begun college, or died (see TEA, 2017, March). The annual dropout rate, therefore, is the percentage of students who dropped out of the grades 7-8, grades 9-12 or grades 7-12 during a school year. **Figure 8** shows comparative dropout rates for students in grades 9-12 enrolled in CTE courses and for HISD, overall, for the 2014–2015 and 2015–2016 school years (TEA, 2016). Published dropout data have a one-year lag.

Figure 8. CTE and HISD Annual Dropout Rates, Ninth Through Twelfth Grade, 2014–2015 and 2015–2016



Source: TEA 2014–2015 and 2015–2016 Annual Dropout Summary Report

- The annual dropout rate among HISD students, overall, was almost twice as high as it was among students enrolled in a coherent sequence of CTE courses in 2015–2016.

- The annual dropout rate for students enrolled in a coherent sequence of CTE courses increased by 0.5 percentage points during the 2015–2016 school year, while it decreased by 0.1 percentage points among HISD students, overall.

Graduation Diplomas

Based on the level and quality of credits acquired during high school, twelfth-grade students could earn one of five types of diplomas. These are completion of Individualized Education Plan (IEP) Regular/Minimum, Recommended, Distinguished Achievement, and Foundation High School Program (**Appendix E, Table E1,** p. 29).

- Most student enrolled in a coherent sequence of CTE courses graduated with Recommended Diplomas (76.1%) in 2016, which was 6.3 percentage points lower compared to students enrolled in a coherent sequence of CTE courses and who graduated in 2015. However, in 2015–2016, the percentage of CTE graduates was 4.6 percentage points higher than the number of total HISD students who graduated with Recommended Diplomas.

- The percentage of students enrolled in a coherent sequence of CTE courses who graduated with a Distinguished Achievement diploma increased from 5.3 percent in 2015 to 7.5 percent in 2016, an increase of 2.2 percentage points compared to the overall district increase of 1.5 percentage points for the corresponding period.

Regression Analysis

Linear regression analyses were conducted to predict students' performance on the 2017 STAAR Algebra I, Biology, English I and II and U.S. History EOC assessments. Details of the analyses are found in **Appendix F, Tables F1 – F5,** pp. 30 and 31. The scores were regressed for subjects by students' gender,

economically-disadvantaged status, LEP, special education eligibility status, gifted and talented (G/T) identification, at-risk status, and career and technical education (CTE) designation.

Algebra I

- The regression model accounted for 24.7 percent of the variance in the 2017 STAAR Algebra I EOC assessment, with a statistically significant ($p < .001$) constant or mean of 3993.1 scale score points (ssp) (Table F1, p. 30).

- Students' G/T identification status had the largest positive variance (419.1) on the Algebra I scale score. Gender also had a positive variance in favor of females at 41.0. Both variances were statistically significant ($p < .001$). CTE designation also had a statistically significant positive variance of 26.5 ssp on Algebra I.

- All other factors in the model had negative variances on the Algebra I scale score: LEP (-160.2 ssp); special education (-296.1 ssp) and at-risk (-250.9 ssp). All were statistically significant at $p < .001$, except students' economically disadvantaged status. It was not significant ($p = .54$).

Biology

- Overall, the regression model accounted for 47.2 percent of the variations in the 2017 STAAR Biology EOC test with a statistically significant constant or mean scale score of 4364.3 ($p < .001$) (**Table F2**, p. 30).

- Student G/T identification status had the largest and only positive variance (498.7 ssp) on the STAAR Biology EOC. It was statistically significant ($p < .001$). All other factors in the model had negative variance on the STAAR Biology EOC scale scores, with gender having the smallest variance at -22.7 ssp. The other factors were economically disadvantaged (-97.2 ssp); LEP (-244.4 ssp); special education (-332.3 ssp); and at-risk (-366.4 ssp). All factors in the model, except CTE designation, were statistically significant ($p < .001$). CTE designation was negative though not significant.

English I

- The regression model for 2017 STAAR English I EOC accounted for 57.0 percent of the variance of the scale score, with a constant or average scale score of 4217.3, which was significant at the $p. < .001$ level (**Table F3**, p. 30).

- Gender (94.3 ssp) and G/T identification (445.8 ssp) had the only positive variance in the model. Both were significant at the $p. <.001$ level. LEP showed the largest variance at -424.5 ssp, and like the other factors was negative. Special education (-371.5 ssp) and at risk (-365.4 ssp) were also negative. All variances were significant at the $p < .001$ level, except for enrollment in CTE courses, which was not significant.

English II

- The linear regression model accounted for 55.2% of the variance in the 2017 STAAR English II EOC scale score. The constant or mean was 4296.7 ssp and it was statistically significant ($p. < .001$) (**Table F4**, p. 31).

- Gender (81.5 ssp) and G/T identification (434.5 ssp) had statistically significant (p. < .001) positive variance on the STAAR English II EOC. All other factors were negative and statistically significant (p. < .001), except for enrollment in CTE courses. CTE enrollment was not significant. Statistically significant factors were economically-disadvantaged (-105.2 ssp); LEP (-490.2 ssp), special education (-337.5 ssp), and at-risk (-390.3 ssp).

U.S. History

- The linear regression model accounted for 40.7 percent of the variance in the 2017 STAAR U.S. History EOC scale score with a statistically significant constant or mean of 4583.7 ssp (Table F5, p. 31).

- G/T identification (372.5 ssp) had the only statistically significant positive variance on the U.S. History EOC. Gender (-106.3), economically disadvantaged (-95.5 ssp), LEP (-364.3 ssp), special education (-400.2 ssp), at-risk (-386.9 ssp), and CTE course enrollment (-24.4 ssp) all had statistically significant (p.< .001), but negative variances on the 2017 STAAR U.S. History EOC.

Discussion

The evaluation showed an increase in the number of students enrolled in a coherent sequence of CTE-courses (2,531 or 11.4%) in HISD for the 2016–2017 school year. It also shows that demographically, the proportions of CTE students and students in the HISD population districtwide were comparable except for non-LEP and at-risk student populations where the difference was 7.5 and 4.9 percentage points, respectively.

Based on the percentage of students who met Approaches Grade Level standard on the 2017 STAAR Algebra I, Biology, English II and U.S. History EOC exams, students enrolled in a coherent sequence of CTE courses outperformed their HISD peers who were not enrolled in any CTE courses. When compared to the proportion of HISD students who graduated districtwide, a higher percentage of students who enrolled in a coherent sequence of CTE courses graduated within four years, while a lower proportion of students dropped out of school. In addition, a higher proportion of students enrolled in a coherent sequence of CTE courses also graduated with Distinguished Achievement diplomas compared to the students in HISD districtwide. According to TEA Accountability measures, students who were enrolled in a coherent sequence of CTE courses as part of a four-year plan of study taking two or more CTE courses for three or more credits during the school year met postsecondary school readiness. It can be construed that a higher proportion of students who were enrolled in coherently sequenced CTE courses met the college readiness standard based on this criterion compared to non-CTE students in HISD.

Overall, of the 5,769 industry-level, course-certification assessments conducted in 2015–2016, there was a pass rate of 79.7 percent in the respective courses. Most of the schools (17), had industry course certification pass rates of 75 percent or higher. Of these, ten schools had 98 – 100 percent certification pass rates.

The data showed that key demographic variables had significant effects on the average scale score of students in all academic areas. Being identified as G/T was the largest predictor of performance on STAAR Algebra I, Biology, and English I EOC exams. LEP was the largest predictor for English II and special education was the largest predictor of U.S. History performance. Regardless of the direction, students' at-risk, G/T identification, special education, and LEP statuses were the largest predictors of performance on the EOC exams.

It can be concluded that HISD students enrolled in coherent sequences of CTE courses were more likely to graduate high schools, more college-ready, more likely to complete high school with Distinguished Achievement diplomas, and were less likely to drop out of school compared to their peers in HISD, districtwide. The findings appear to be consistent with the research on students enrolled in CTE courses, particularly as they relate to their improved retention in those programs and completion (Alfeld & Bhattacharya, 2012), higher performance and outcomes (Deitrich, Lichtenberger, & Kamalludeen, 2016; Lekes, et al., 2007; Phelps & Chan, 2016), and college readiness (Lekes, et al., 2007). What cannot be confirmed in this evaluation, due to unavailable data, is how CTE students experience course delivery, their perceptions of these experiences, and the extent to which CTE graduates go on to enroll in college or gain employment in CTE fields. Also unconfirmed is the extent to which exposure to the CTE program in high school is instrumental in students' subsequent occupational choices and extent to which skills learned are consistent with the required employment skills.

Recommendations

- Ensure that strategies continue to be in place to increase student enrollment in coherent sequences of CTE courses and to increase program completion because, based on the findings, students in these courses outperform their peers.

- Future studies should include students' experiences with enrollment in coherent sequences of CTE courses, and the portion of graduates who gain access into employment-related areas of study to determine the true impact of the CTE program.

- Given the better performance of students enrolled in coherent sequences of CTE courses, greater focus need to be placed on reversing the negative performance predictors for coherent sequences of CTE courses including economic disadvantaged, LEP, special education, and at-risk statuses.

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Appendix A

Table A1. CTE Pathways, Career Opportunities, Certification and Licensures Available to HISD Students, 2016–2017

CTE Pathways	High School Where Offered	Fast-Growing Career Opportunities	Certifications and Licensures
Agriculture, food and natural resources	Austin Bellaire Booker T. Washington Chavez Furr Harper Alternative School Lamar Madison North Forest Worthing	Veterinary Technicians Agricultural Inspectors Forest and Conservation Workers	Certified Veterinary Assistant (CVA Level 1) Texas Floral Design- Level 1 Certification
Architecture and Construction	Furr Jordan Houston MTSC Jones Future Lamar Milby Scarborough Waltrip Washington Wisdom	Construction management Civil Engineers Heating and Cooling Technicians	NCCER - Construction Technology NCCER – HVAC NCCER- Plumbing AutoCAD - Certified Associate Certified SOLIDWORKS Associate (CSWA)
Arts, A/V Technology & Communication	Chavez Furr Heights Jordan Kashmere Lamar Milby Northside Sharpstown Waltrip Westside Yates	Audio/Visual Technicians Multimedia Artist and Animators Technical Writers	Adobe Certified Associate (ACA) Video communication Adobe Certified Associate (ACA)- Visual Communication Apple Final Cut Pro
Business Management & Administration	Austin Bellaire Heights Houston Academy of International Studies Lamar High Liberty North Houston Early College Sterling Westside Wisdom	Human Resource Specialist Sales Agents and Managers Market Research Analyst	Microsoft Officer Certified Master A*S*K Business Fundamental NOCTI-Business Sales Force
Education and Training Services	Austin	Teacher Coaches and Recreation Instructors Social Workers	Early Childhood Education Assessment and Certification Pre-professional Certification in Education Fundamental
Finance	Bellaire Heights High School for Law and Justice Lamar Liberty Sharpstown Westbury Westside	Accountants and Financial Analyst Loan Clerks and Bank Officers Financial Advisors	QuickBooks Certified Use A*S*K Finance

Table A1. CTE Pathways, Career Opportunities, Certification and Licensures Available to HISD Students, 2016–2017

CTE Pathways	High School Where Offered	Fast-Growing Career Opportunities	Certifications and Licensures
Government and Public Administration	High School for Law and Justice	Foreign Service Officer Political Science Teacher Paralegal	
Health Science	Chavez DeBakey Jones Futures Heights Long Futures Madison Milby Sharpstown Waltrip Westbury Westside	Dental Assistant Biomedical Technician Registered Nurse	Certified Clinical Medical Assistant (CCMA) Phlebotomy Technician Certification (CPT) Certified patient Care Technician/Assistant (CPCT/A) Pharmacy Technician Trainee Nursing Assisting Assessment (CNA) National Entry Level Dental Assistant (NELDA)
Hospitality and Tourism	Harper Alternative Jordan Lamar Milby Northside Westside Wheatley Worthing	Hotel manager Chef and Head Cook Food and Beverage Service Worker	ServSafe Food Handlers ProStart National Certificate of Achievement-Culinary Arts ProStart National Certificate of Achievement-Hotel and Restaurant Management
Human Services	Jordan Houston MTSC	Massage Therapist Spa Manager	Texas Cosmetology Operator License
Information Technology	Austin Bellaire Booker T Washington Eastwood Academy Heights High School for Law and Justice High School for the Performing and Visual Arts Houston MTSC Lamar Madison Mickey Leland Milby North Forest Northside Scarborough Sharpstown South Early Waltrip Westbury Westside Wisdom Wheatley Worthing	Computer Programmers Computer Engineers Database Administrators	BISCI- Cabling Installation CompTIA – Strata, A+, Network+ Security+ Adobe Certified Associate–Web Authoring, Interactive Media CIW–Web Design Specialist, Web Security Associate, Internet Business Associate STARS Certification SPACE Certification ESRI technical Certification– Desktop MOS Word< Excel, PowerPoint, Access
Law, Public Safety, Corrections and Security	Chaves High School for Law and Justice North Forest Sterling Waltrip Westbury Wisdom	Emergency Medical Technician Police Officer Paralegal	Criminal Justice/CSI Basic Telecommunicator Teen Forensics Municipal Jailer Texas Commission on Fire Prevention Certificate State Emergency Medication (EMT) Certification
Manufacturing	Houston MTSC Jordan	Welder	Autodesk Certified User

Table A1. CTE Pathways, Career Opportunities, Certification and Licensures Available to HISD Students, 2016–2017

CTE Pathways	High School Where Offered	Fast-Growing Career Opportunities	Certifications and Licensures
	Madison Milby Sterling Wisdom	Machinist Technician	Certified SOLIDWORKS Associate (CSWA) NCCER–Welding AWS Certification
Marketing Sales and Service	Bellaire Jordan Heights Scarborough Westbury Wisdom	Sales Agents and Managers Merchandisers Retail Salespeople	A*S*K–Marketing Fundamentals A*S*K Entrepreneurship National Retail Federation Customer Service and Sales
S.T.E.M.	Austin Chavez Booker T. Washington Eastwood Academy Energy Institute Furr Heights Houston Kashmere Lamar Madison Milby South East Early College Waltrip Westbury Westside Young Women's College Prep Academy	Geological Technician Geoscientist Engineer	Certified Clinical Medical Assistant (CCMA) Autodesk Certified User Certified SOLIDWORKS Associate (CSWA)
Transportation, Distribution & Logistics	Austin Heights Houston MTSC Jordan Madison North Forest Sterling Waltrip Westbury Wheatley Yates	Merchant Mariner Auto/Diesel Technician Airline Pilot	ASE-Brakes, Electronic/Electrical Systems, Heating and A/C, Engine Repair CLA CLT GLA

Appendix B. PEIMS Graduation Codes

Table B1. Career and Technical Education Indicator Codes, PEIMS 2015–2016 Data Standards

Code	Translation
	When assigning the Career and Technical Indicator Code, include enrollment in all Career and Technical Education (CTE) courses, regardless of course funding weight
0	Not Enrolled In A CTE Course
1	Enrolled In A CTE Course A student in grades 6-8 who is taking a CTE course as of the fall snapshot date or completed a CTE course by the end of the school year. A student in grades 9-12 who is taking a CTE course as of the fall snapshot date or completed a CTE course by the end of the school year, and the student's 4-year plan of study does not outline a coherent sequence of courses in CTE
	The following codes are for students who on the fall snapshot date: (a) have a 4-year plan to take a coherent sequence (2 or more CTE courses for 3 or more credits) of courses in CTE, and (b) are enrolled in or have completed a semester of CTE course(s), which are part of their CTE coherent sequence of courses. If a student's 4-year plan changes, then the student could go from a code 2 or 3 to a 0 or 1 in a subsequent school year
2	Participant In A Coherent Sequence Of Courses A student in grades 9-12 who is enrolled in a sequential course of study, which develops occupational knowledge, skills, and competencies relating to a CTE program of study. The student must have a 4-year plan of study to take 2 or more CTE courses for 3 or more credits
3	Participant In Tech Prep Program A student in grades 9-12 who follows a state approved Tech Prep high school plan of study leading to postsecondary education and training. The student must have a 4-year secondary plan of study that includes a CTE coherent sequence of courses of 2 or more CTE courses for 3 or more credits. The plan must provide at least one option for articulated and/or concurrent credit at the postsecondary level

Source: TEA 2014-2015 PEIMS Data Standards Section 4 - Description of Codes, p. 4.108

Table B2. Description of Career and Technical Education Codes, Texas Education Data Standards, 2016–2017

Code Table ID	Name	XML Name	Date Issued	Date Updated
C142	CAREER-AND-TECHNICAL-ED-INFO-CD	TX-CareerAnd TechnologyEdType	3/3/1993	3/1/2016
Code	Translation			
	When assigning the Career and Technical Indicator Code, include enrollment in all Career and Technical Education (CTE) courses, regardless of course funding weight			
0	Not Enrolled In a CTE Course			
1	Enrolled In A CTE Course A student in grades 6-8 who is taking a CTE course as of the fall snapshot date or completed a CTE course by the end of the school year. A student in grades 9-12 who is taking a CTE course as of the fall snapshot date or completed a CTE course by the end of the school year, and the student's 4-year plan of study does not outline a coherent sequence of courses in CTE			
	The following code is for students who on the fall snapshot date: (a) have a 4-year plan to take a coherent sequence (2 or more CTE courses for 3 or more credits) of courses in CTE, and (b) are enrolled in or have completed a semester of CTE course(s), which are part of their CTE coherent sequence of courses. If a student's 4-year plan changes, then the student could go from a code 2 to a 0 or 1 in a subsequent school year			
2	Participant In A Coherent Sequence Of Courses A student in grades 9-12 who is enrolled in a sequential course of study, which develops occupational knowledge, skills, and competencies relating to a CTE program of study. The student must have a 4-year plan of study to take 2 or more CTE courses for 3 or more credits			

Source. 2016–2017 Texas Education Data Standards, Section 4 Description of Codes, p. 4.118

Appendix C

Table C1. Number of STAAR Students Tested by EOC Subject and Evaluation Groups, HISD, 2016–2017

Subject	Non-CTE		CTE Non-Sequenced Courses		CTE Sequenced Courses	
	2016	2017	2016	2017	2016	2,017
Algebra I	2,304	5,310	2,200	2,932	4,756	4,687
Biology	2,734	3,845	2,909	2,838	5,609	5,866
English I	3,733	4,120	3,600	2,881	7,193	6,006
English II	3,895	2,824	2,587	2,701	6,851	6,888
US History	3,177	2,766	2,253	2,451	4,207	6,004

Source: HISD Student 2016–2017 PEIMS (Department of Research and Accountability Access database): STAAR EOC Spring Test Files, 2016–2017.
Note: Date is based on first-time testers

Appendix D: CTE Certifications

Industry Certification

An industry certification is a credential that validates the ability to perform certain basic tasks essential to a particular industry. These certifications are usually created by a particular company such as ACA (Adobe Certified Associate).

License

A license is a Texas government issued certificate which indicates completion of a training program with a minimum number of hours and successful acquisition of basic skills essential for specific trades or professions. Examples would be a state issued Cosmetology license or a Licensed Pharmacy Technician Trainee.

Occupational Competency Assessment

An occupational competency assessment is a technical skills assessment created by groups such as the A*S*K Business Institute, which contends that the student has mastered job-ready technical knowledge. Examples include the A*S*K Business Fundamentals test (basic skills in Human Resources) and NCCER Welding.

Note: *Other Houston ISD approved program specific certifications, which are administered early for safety reasons or are needed in order to advance to end of program certifications, are also available such as: ServSafe; NCCER-Core; CPR- infant and adult; OSHA; MOS and etc.*

Table D1. Distribution by School of CTE Certification Results, HISD, 2015–2016

School	Passed	Failed	Total	% Pass
Sterling HS	101	0	101	100.0
North Houston EC HS	53	0	53	100.0
HSLJ	119	0	119	100.0
Austin HS	36	0	36	100.0
Challenge EC HS	242	1	243	99.6
Eastwood Acad. HS	709	8	717	98.9
Scarborough HS	163	2	165	98.8
DeBakey HSHP	632	11	643	98.3
Westbury HS	950	23	973	97.6
Chavez HS	136	21	157	86.6
Lamar HS	25	4	29	86.2
Jones HS	6	1	7	85.7
Houston MSTC HS	443	80	523	84.7
Jordan HS	19	5	24	79.2
Milby HS	168	54	222	75.7
Bellaire HS	12	4	16	75.0
Madison HS	97	66	163	59.5
Energy Inst HS	35	30	65	53.8
Westside HS	18	20	38	47.4
Heights HS	226	274	500	45.2
Long Academy	398	518	916	43.4
South EC HS	8	45	53	15.1
YWCPA	*	*	1	*
Middle College HS - Gulfton	*	*	4	*
Beechnut Acad.	*	*	1	*
Total/Mean	**4597**	**1172**	**5769**	**79.7**

Note: *Less than five students tested

Appendix E. Graduation Diplomas

Table E1. Percent of CTE Graduates by Diploma Type, Spring 2015 and 2016

CTE Code 2	Type of Diploma	PEIMS Code	2015		2016	
			N	%	N	%
	Completion of individualized Education Plan[1]	04, 05, 06, 07	92	2.7	80	.02
	Regular/Minimum[1]	18, 19, 20, 21, 24, 27, 30	287	8.3	281	8.5
	Recommended	22, 25, 28, 31	2,860	82.4	2,504	76.1
	Distinguished Achievement	23, 26, 29, 32,	184	5.3	247	7.5
	Foundation High School Program	34, 35, 54, 55, 56, 57	46	1.3	180	5.5
HISD	Completion of individualized Education Plan	04, 05, 06, 07	393	4.0	322	3.1
	Regular/Minimum	18, 19, 20, 21, 24, 27, 30	1,294	13.3	1,272	10.5
	Recommended	22, 25, 28, 31	7,217	74.1	7,310	71.5
	Distinguished Achievement	23, 26, 29, 32,	624	6.4	809	7.9
	Foundation High School Program	34, 35, 54, 55, 56, 57	212	2.2	512	5.0

Source: District and School Profiles, 2014–2015 and 2015–2016; HISD 2015–2016 Graduate File (Access); PEIMS 2014–2015 and 2015–2016 (Access).

Note: [1]Applies only to students receiving special education services. These students graduated in a minimum high school program under TAC Chapter 74 with curriculum content modifications through the student's individualized education program (IEP).

No statutory exclusions for state accountability were applied.

Appendix F: Regression Tables

Table F1. Selected Predictors of HISD 9th through 12th-Grade Student Performance on the 2017 STAAR Algebra I EOC Assessment

Variable	Coefficient	β	[95% Confidence Interval]	
Constant	3993.1**	-	3969.1	4017.0
Gender	41.0**	.045	25.8	56.2
Economically Disadvantaged	5.9	.005	-13.1	24.9
Limited English Proficiency (LEP)	-160.2**	-.154	-178.9	-141.5
Special Education	-296.1**	-.188	-323.0	-269.3
G/T Identification	419.1**	.229	387.1	451.1
At Risk	-250.9**	-.233	-271.2	-230.6
Career & Technical Education	26.5**	.052	17.8	35.2
R^2	0.248			
F	483.2**			
Adjusted R^2	0.247			

n = 10,268; **p <.001; Approaches Grade Level Standard 3500–3970, Masters Student Standard 4333–6100

Table F2. Selected Predictors of HISD 9th through 12th-Grade Student Performance on the 2017 STAAR Biology EOC Assessment

Variable	Coefficient	β	[95% Confidence Interval]	
Constant	4364.3**	-	4343.2	4385.5
Gender	-22.7**	-.020	-36.9	-8.6
Economically Disadvantaged	-97.2**	-.076	-114.1	-80.3
Limited English Proficiency (LEP)	-244.4**	-.171	-263.7	-225.1
Special Education	-332.3**	-.154	-360.1	-304.5
G/T Identification	498.7**	.332	477.6	519.9
At Risk	-366.4**	-.313	-384.2	-348.6
Career & Technical Education	-3.9	-.006.	-12.0	4.2
R^2	0.472			
F	1633.5**			
Adjusted R^2	0.472			

n = 12,798; **p < .001; Approaches Grade Level Standard: 3500–3967; Masters Student Standard: 4567–6203

Table F3. Selected Predictors of HISD 9th through 12th-Grade Student Performance on the 2017 STAAR English I EOC Assessment

Variable	Coefficient	β	[95% Confidence Interval]	
Constant	4217.3**	-	4198.2	4236.3
Gender	94.3**	.083	81.7	107.0
Economically Disadvantaged	-111.5**	-.085	-126.7	-96.3
Limited English Proficiency (LEP)	-424.5**	-.302	-441.4	-407.7
Special Education	-371.5**	-.166	-396.6	-346.4
Gifted & Talented	445.8**	.292	426.8	464.8
At Risk	-365.4**	-.304	-381.5	-349.2
Career & Technical Education	2.8	.004	-4.5	10.0
R^2	0.570			
F	2581.0**			
Adjusted R^2	0.570			

n = 13,592; **p < .001; Approaches Grade Level Standard: 3750–3969; Masters Student Standard: 4691–6314

Table F4. Selected Predictors of HISD 9th through 12th-Grade Student Performance on the 2017 STAAR English II EOC Assessment

Variable	Coefficient	β	[95% Confidence Interval]	
Constant	4296.7**	-	4275.0	4318.5
Gender	81.5**	.068	67.4	95.6
Economically-Disadvantaged	-105.2**	-.078	-121.7	-88.8
Limited English Proficiency (LEP)	-490.2**	-.335	-508.5	-471.9
Special Education	-337.5**	-.138	-366.4	-308.5
Gifted & Talented	434.5**	.275	414.3	454.7
At Risk	-390.3**	-.298	-408.0	-372.6
Career & Technical Education	-4.5	-.006	-13.0	4.1
R^2	0.552			
F	2257.1**			
Adjusted R^2	0.552			

n = 12,835; **p < .001; Approaches Grade Level Standard: 3750–3961; Masters Student Standard: 4831–6341

Table F5. Selected Predictors of HISD 9th through 12th-Grade Student Performance on the 2017 STAAR U.S. History EOC Assessment

Variable	Coefficient	β	[95% Confidence Interval]	
Constant	4583.7**	-	4560.5	4606.9
Gender	-106.3**	-.096	-121.9	-90.6
Economically Disadvantaged	-95.5**	-.080	-113.1	-78.0
Limited English Proficiency (LEP)	-364.3**	-.209	-389.7	-338.8
Special Education	-400.2**	-.178	-432.3	-368.1
Gifted & Talented	372.5**	-.241	348.9	396.1
At Risk	-386.9**	-.326	-405.9	-367.9
Career & Technical Education	-24.4**	-.037	-33.8	-15.0
R^2	0.407			
F	1137.5**			
Adjusted R^2	0.407			

n = 11,590; **p < .001; Approaches Grade Level Standard; 3500–3966; Masters Student Standard: 4400–6476