MEMORANDUM November 7, 2014

TO: Board Members

FROM: Terry B. Grier, Ed.D.
Superintendent of Schools

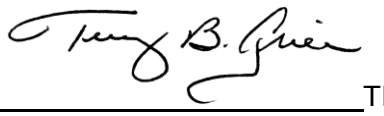
SUBJECT: **CAREER AND TECHNICAL EDUCATION EVALUATION REPORT**

CONTACT: Carla Stevens, (713) 556-6700

Attached is the 2013–2014 evaluation report on the Career and Technical Education (CTE) program. CTE prepares the Houston Independent School District (HISD) students for postsecondary success by facilitating the acquisition of skills, aspirations, and motivation to succeed in the workplace and in college. This report provides a summary of CTE program activities and student outcomes.

CTE course enrollment of sixth through twelfth-grade students increased at a higher rate than the district enrollment at comparable grade levels from 2012–2013 to 2013–2014. A higher percentage of CTE students on career pathways met the Satisfactory Level II, phase-in I standard than non-CTE students on the 2014 STAAR Algebra I, Biology, English I, English II, and U.S. History End-of-Course exams. The annual dropout rate for CTE students dropped from 2.8 percent in 2012 to 1.9 percent in 2013. The four-year longitudinal graduation rates of CTE students in the ninth-grade cohort were higher than similar rates of students districtwide in 2011–2012 and in 2012–2013.

Administrative Response: The Career Readiness Department has reviewed the 2013–2014 Career and Technical Education (CTE) program evaluation. The report describes and evaluates specific trends within the district's CTE program. Additionally, we are pleased to see that CTE students outperformed non-CTE students on STAAR EOC. The department has begun major reviews of the CTE programs across the district with a goal of increasing enrollment in CTE programs and work-based learning opportunities for students. The department annually reviews CTE programming across the district with the goal of developing high school CTE programs aligned with the following criteria: local labor market; demand for career field; proximity to potential local industry partners; proximity to neighboring schools to avoid redundancy; current school magnet program theme; availability of industry certification or postsecondary opportunities; possibility of school-based enterprise; relevant student organizations; capacity of school facility to engage in specific programs; adequate student enrollment to support programs; and student interest.



TBG

Attachment
cc:

Superintendent's Cabinet
Don Hare
Michael Webster

HOUSTON INDEPENDENT SCHOOL DISTRICT

RESEARCH

Educational Program Report

CAREER AND TECHNICAL EDUCATION, 2013 – 2014

HISD | Research and Accountability
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CAREER AND TECHNICAL EDUCATION
PROGRAM SUMMARY AND STUDENT PERFORMANCE OUTCOMES, 2013–2014

Executive Summary

The Career and Technical Education program (CTE) in the Houston Independent School District (HISD) prepares students for postsecondary success by facilitating the acquisition of skills, aspirations, and motivation to succeed in the workplace and in college. Postsecondary opportunities allow CTE students to earn college credit by taking Dual Credit and Advanced Technical Credit courses. Students participate in leadership organizations to strengthen their knowledge and skills taught in the classroom. CTE teachers deliver a state-approved curriculum supported by professional development. Business and community partners provide mentorships, guidance, real-world experiences, and financial support to help students become successful in school and in future careers. As part of the CTE program, the Linked Learning initiative ensures a comprehensive high-school program of rigorous academic and technical courses emphasizing industry-themed, real-world applications. Students complete at least three courses meeting industry standards for certification and work-based learning that offer mentoring, job shadowing, internships, entrepreneurships and personalized supports. Students receive the academic, social-emotional, college/career guidance, as well as transportation support needed to be successful in related areas. To that end, this evaluation will describe and analyze:

- CTE enrollment trends,
- CTE program initiatives,
- STAAR End-of-Course 2014 performance of CTE students compared to students who were not classified as CTE students; and
- Graduation and dropout trends.

For this report, CTE and non-CTE classifications were derived from the Public Enrollment Information Management System (PEIMS)[1] for the respective years that data were presented. In PEIMS, CTE students are coded a “1”, “2” or “3”; whereas, non-CTE students are coded “0”. These classifications were used to document enrollment trends. Grade levels of CTE students ranged from sixth to twelfth grade. Academic achievement, graduation, and dropout trends were based on students coded CTE 2 (coherent sequence) and 3 (tech prep) to document the performance of students with a career pathway concentration.

Highlights

- There was an increase in CTE course enrollment of sixth through twelfth-grade students (codes 1, 2, and 3) during the 2013–2014 academic year compared to the 2012–2013 academic year (from 31,871 to 33,005 or 3.6 percent). Over the same time period, district enrollment of students at the same grade levels also increased, but at a slightly lower rate of 3.5 percent.
- There were higher percentages of Hispanic and African American students enrolled in CTE courses in grades sixth through twelfth-grade when compared to students districtwide in 2013–2014. In addition, CTE students were more likely to be economically disadvantaged, at risk, and limited English proficient, and less likely to be identified as special education, White, and gifted/talented relative to these student groups districtwide in 2013–2014.

[1] PEIMS Data Standards, CTE indicator code criteria are in **Appendix A**, p. 13.

- Enrollment trends from 2009–2010 to 2013–2014 show that the number of CTE on a career pathway increased by 36.0 percent (from 13,825 to 18,737 students).
- In 2013–2014, students earned 4,226 certifications/licensures, with the highest number earned in financial literacy. For the last two years, the CTE department has instituted a policy of "quality not quantity" of certifications/licensures attainment. As such, the district supports end-of-program certifications aligned with national or internationally recognized industry or business certification or licensure.
- Based on the STAAR EOC, Level II, phase-in I standard, the percentage of CTE students (codes 2 and 3 combined) outperformed non-CTE students on the 2014 Algebra I EOC by ten percentage points (75 percent vs. 65 percent). A higher percentage of CTE students compared to non-CTE students met Satisfactory on the 2014 Biology EOC (88 percent vs. 83 percent), the English I EOC (59 percent vs. 48 percent), and the English II EOC (62 vs. 52 percent). On the U.S. History EOC, the percentage of CTE students who met Satisfactory exceeded the percentage of non-CTE students who met the standard by six percentage points (93 vs. 87 percent).
- CTE students on career pathways classified as at risk and special education were more likely to attain lower Algebra I and Biology EOC scale scores in 2014 than their CTE peers without these classifications. In contrast, CTE gifted/talented students were more likely to attain higher scale scores than students not classified as gifted/talented on these assessments.
- There was a larger increase in the percentage of CTE students on career pathways who earned the Distinguished Achievement diploma from 2012 to 2013 (3.9 percent vs. 5.9 percent) when compared to students districtwide (6.1 percent vs. 6.7 percent).
- The annual dropout rate for CTE students in grades nine through twelve on career pathways reflected a higher rate of decrease than the district from 2012 to 2013. The annual dropout rates dropped from 2.8 to 1.9 percent for CTE students and from 4.8 to 4.0 percent for students districtwide.
- The four-year longitudinal graduation rates of CTE students from the ninth-grade cohort were higher than similar rates of students districtwide in 2011–2012 and in 2012–2013. For CTE students, the longitudinal graduate rates were 90.4 and 90.1 percent in the respective years, and for the district, the rates were 78.8 and 78.6 percent in the respective years.

Recommendations

1. Continue to provide program offerings and initiatives across career concentrations so that CTE program students can select their career interests from a variety of career pathways and participate in multiple career development experiences. The diversity of course offerings available for students encourages career exploration and helps students to develop an awareness of their future career options.

2. The percentages of CTE students from the ninth-grade cohort who graduated from high school in four-years remained consistently higher than the four-year longitudinal graduation rates of districtwide students for the past two years. Similarly, annual dropout rates of CTE students were lower than those of HISD students. Considering the higher longitudinal graduation rates and lower annual dropout rates of CTE students, efforts should continue to be made to increase the enrollment of high school students in CTE courses that allow students to focus on career pathways. Early enrollment in the CTE program may help students develop a stronger connection to school and career-oriented activities such that graduation becomes a more realistic and attainable goal.

Administrative Response

The Career Readiness Department has reviewed the 2013–2014 Career and Technical Education (CTE) Program Evaluation. The report describes and evaluates specific trends within the district's CTE program. Additionally, we are pleased to see that CTE students outperformed non-CTE students on STAAR EOC. The department has begun major reviews of the CTE programs across the district with a goal of increasing enrollment in CTE programs and work-based learning opportunities for students. The department annually reviews CTE programming across the district with the goal of developing high school CTE programs aligned with the following criteria: local labor market; demand for career field; proximity to potential local industry partners; proximity to neighboring schools to avoid redundancy; current school magnet program theme; availability of industry certification or postsecondary opportunities; possibility of school-based enterprise; relevant student organizations; capacity of school facility to engage in specific programs; adequate student enrollment to support programs; and student interest.

Introduction

The Career and Technical Education program (CTE) in the Houston Independent School District (HISD) has a mission to equip students with the marketable academic and technical skills needed to compete in the global workforce and/or to continue their education at the post-secondary level after graduation. The CTE department collaborates with principals, instructional leaders, and industry professionals to design, implement, and assess core and career program offerings. To ensure continuous student achievement, basic and advanced academics as well as technical skills are integrated into the curriculum to enhance the attainment of competent proficiencies and standards. The CTE program provides students with real work opportunities exposing them to the demands of the workforce. These opportunities are made available by collaborations between HISD, local businesses, and professional organizations.

The CTE program in HISD offers a variety of career education courses that prepare students for entry into institutions of higher learning or the workforce. These courses are taught by certified CTE instructors. Sixth-grade through twelfth-grade students can enroll in elective courses that match their career interests. Students who select CTE courses as general electives are coded as CTE 1 participants.

High school students can develop a career concentration and take multiple CTE courses that correspond with their interests. Students who select a coherent sequence of courses are coded as CTE 2 and 3. (See **Appendix A**, p. 15, for additional descriptions of CTE codes.) The development of a career pathway concentration that is planned from a strong coherent sequence of courses allows students the opportunity to identify career options that lead to transferable skills and knowledge. (See **Appendix B**, p. 16, for career concentrations and related courses.) The Texas Education Agency (TEA) has identified the following career concentrations:

- Agriculture, Food and Natural Resources;
- Architecture and Construction;
- Audio/Visual (A/V) Technology and Communications,
- Business, Management and Administration;
- Education and Training;
- Finance;
- Health Science;
- Hospitality and Tourism;
- Human Services;
- Information Technology;
- Law, Public Safety, Corrections, and Security;
- Manufacturing;
- Marketing, Sales, and Service;
- Science, Technology, Engineering, and Mathematics; and
- Transportation, Distribution and Logistics.

In an effort to address the developing needs of the future workforce, the Texas Education Agency (TEA) and the Texas Higher Education Coordinating Board (THECB) have revised a plan of action, the Texas State Plan for Career and Technical Education, 2008–2013. The CTE State Plan outlines a renewed vision for career and technical education programs where there is clear understanding that academic education and technical education are not in conflict with one another; instead, academic concepts are reinforced and utilized in technical education applications (CTE State Plan, 2007). HISD's

CTE program's philosophy clearly emphasizes that a rigorous academic foundation contributes to success in school and in life; that all students should be provided equal access to opportunities that will help them succeed; and that career and technical education should complement and enhance academic preparation by enabling students to apply learned principles to a variety of family, community, and career situations.

The HISD CTE program has adopted the state plan to provide academic excellence as defined by the federal *No Child Left Behind* law. This includes the provision of quality career and guidance counseling; partnerships that benefit students and schools; rigorous academic and technical curricula supporting seamless career pathways; professional development for educators to enhance teaching and learning; ongoing data evaluation of student performance; and administrative leadership for program effectiveness and compliance.

Methods

Data Collection

- Descriptive data, including student demographics and longitudinal enrollment figures in the CTE program, were obtained from the Public Education Information Management System (PEIMS). Within the program, students were assigned a CTE code that indicated their level of enrollment in CTE courses. Students who took one or more CTE course as electives were coded "1"; students enrolled in CTE courses as part of a coherent sequential plan of study were assigned a code of "2"; and students enrolled in Advanced Technical Credit (ATC) courses received a code of "3" (See Appendix A). Enrollment numbers were collected based on total CTE participation as well as by code participation. Certification data were obtained from CTE personnel, while the Career and Technical Education website (HISD, 2014) provided details about the program and curriculum.
- The State of Texas Assessments of Academic Readiness (STAAR) is a state-mandated, criterion-referenced assessment used to measure student achievement. For this report, the STAAR results include End-of-Course (EOC) assessments in English language arts (English I and English II), mathematics (Algebra I), science (Biology), and US History. The performance standards set for the STAAR end-of-course assessments are as follows:
    - **Level I: Unsatisfactory Academic Performance** – students are inadequately prepared for the following course.
    - **Level II: Satisfactory Academic Performance** – students are sufficiently prepared for the next course.
    - **Level III: Advanced Academic Performance** – students are well prepared for the following course.
- CTE and HISD annual dropout and longitudinal graduation rates were obtained from the Texas Education Agency (2014) Accountability Completion, Graduation, and Dropout reports on September 22, 2014. The data are based on the federal definitions without exclusions.
- Descriptive statistics included frequencies and percentages of students who met Satisfactory Level II, phase-in I and Advanced standards on the spring 2013 and spring 2014 EOC exams for ninth through twelfth-graders. STAAR results for CTE 2 and 3 coded students were combined to create the CTE student group, and the results for CTE 0 and 1 coded students were combined to create the non-CTE student group. Independent t-test analysis compared the Algebra I and Biology I EOC scale score performance of CTE students with non-CTE students in grades nine

through twelve. Regression analysis measured the strongest predictors of Algebra I and Biology I scale score performance for the CTE (code 2 and 3) ninth through twelfth-graders.

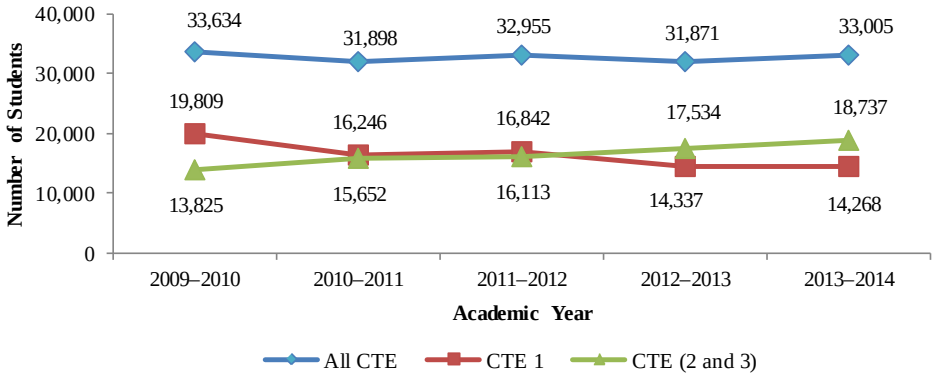
Results

What were the demographic characteristics of students enrolled in the CTE program over the past five years, 2009–2014?

Figure 1 presents five-year CTE enrollment data by CTE program codes from 2009–2010 through 2013–2014. CTE student enrollment by program code is shown in **Table 1** for the current and the previous academic year (see **Appendix C**, p. 17). **Table 2** (**Appendix D**, p.18) displays enrollment trends for all CTE students by demographic characteristics.

- Figure 1 shows that the number of students enrolled in CTE 1 courses as elective-takers decreased from 19,809 in 2009–2010 to 14,268 in 2013–2014 (28.0 percent). However, the number of CTE 2 (coherent sequence) and 3 (tech prep) students on career pathways increased from 13,825 in 2009–2010 to 18,737 in 2013–2014 (36.0 percent). Consequently, overall CTE student enrollment decreased from 33,634 students to 33,005 students over the same time period (1.9 percent).

Figure 1. Trends in CTE enrollment, 2009–2010 through 2013–2014



- Two-year trends displayed in Table 2 (Appendix D, page 18) reveal that the percentage of economically-disadvantaged students within the district in grades six through twelve slightly increased from 74.6 percent in 2012–2013 to 75.9 percent in 2013–2014. The percentage of economically-disadvantaged students enrolled in CTE courses (codes 1, 2, and 3 combined) also increased during this two-year period (75.4 percent vs. 76.6 percent).
- In the current year (2013–2014), there were higher percentages of Hispanic and African American students enrolled in CTE courses compared to sixth through twelfth-grade students districtwide in 2013–2014 (Table 1, p. 17).
- CTE students were more likely to be economically disadvantaged, at risk, and limited English proficient, and less likely to be identified as special education, White, and gifted/talented compared to the HISD sixth through twelfth-grade student group (Table 1, p. 17).

What were key CTE program initiatives implemented in HISD during the 2013–2014 academic year?

The HISD CTE program implemented several key initiatives that gave HISD students opportunities to explore career options, prepare for work and post-secondary education. The initiatives ensured that all CTE students developed career awareness within their selected course of study, as well as received exposure to professional experiences to develop mastery, confidence, and leadership skills.

In addition to key initiatives, the CTE department offers a variety of programs from which students can 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. Some of the 2013–2014 CTE program initiatives include the following (listed alphabetically):

Business Partnerships

Business partnerships provide students with enriching learning experiences such as one-on-one mentoring and real-world work opportunities. CTE students are allowed to participate in field trips, site visits, and internships at local business. 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. Some of HISD business partners include Baker Hughes, CVS/Pharmacy, Exxon, Houston Community College, and Kroger. Local industry and business affiliates such as Mustang CAT, Kroger, Baker Hughes, and International Trucks of Houston have partnered with district high schools to provide support such as paid and unpaid internships for students, classroom speakers, facility tours, teacher externships and financial and human capital assistance for the CTE When I Grow Up Career EXPO.

Career Cowboy and Ready Wagon

Career exploration presentations are presented to HISD elementary school students to increase their career awareness and peak their interest in various careers within the local labor market. The Career Cowboy provides students with interactive, music-filled demonstrations with information about different professions. Students also participate in activity stations and hands-on demonstrations that help them begin to develop links between skills, interests and career choices.

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 work force and/or for college training. HISD has developed several partnerships with local, regional, and national professional organizations so that the school-level student organizations can fully participate in activities and 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), SkillsUSA, and the Technology Student Association (TSA).

Career Preparation, Internships, and Job Shadowing

Within CTE, students gain valuable insight and hands-on career experiences through internships and job shadowing. Students are placed in work-based settings in order to acquire knowledge and skills within real work environments. HISD has developed partnerships with various organizations and companies that provide students with on-the-job training experiences. For example, CTE students served as interns at Texas Children's Hospital and Methodist Hospital throughout the school year. Several students attending the High School for Law Enforcement and Criminal Justice participated in job shadowing experiences at the Houston Emergency Center.

Certifications/Licensures

Students within the CTE program have the opportunity to earn industry certifications and/or licenses within their chosen career pathways. Industry certifications serve as evidence of technical skill attainment. Earning industry certifications gives students a sense of accomplishment, a highly-valued professional credential, and helps them become more employable and eligible for higher starting salaries. There are over 90 professional certificates or licensures that are approved by TEA that CTE high school students can earn. These certifications/licensures are connected to multiple industry careers such as cosmetology, automotive technology, and several business-related fields. During the 2012–2013 academic year, the CTE department revised the certification process to be aligned to the labor demand in order to reduce costs and make certifications more meaningful. In 2013–2014, CTE students earned 4,226 certifications/licensures, with the highest number earned in financial literacy (**Appendix E**, **Table 3**, p. 19).

College Credit for CTE Students

There are two different kinds of courses that CTE students can take in order to earn college credit; dual credit courses and advanced technical credit courses. Students within these courses are taught and graded in the same manner as college students who take the courses. Credits from these courses count toward the Distinguished Achievement Program (DAP) graduation plan, when students earn a grade of "B" or better. All courses are open to eleventh and twelfth-grade students and are provided at no charge.

Dual credit courses are the only courses that allow students to earn both high school and college credit hours simultaneously. They are developed and taught by college-approved instructors. No prerequisite classes are required to enroll in these courses. Advanced technical credit (ATC) courses are developed at the state level and are taught by local high-school teachers who received specialized training. College credit for ATC courses are awarded once students enroll in a participating college or university. The ATC program provides an opportunity for students to receive credit at participating community colleges across Texas for taking certain enhanced technical courses during high school. ATC courses are only offered in technical or workforce areas. The teacher of the course must meet the ATC teacher requirements, go through ATC training, and teach the high school course so that it meets the content of the equivalent college course.

Dual Credit and Advanced Technical Credit opportunities are offered on many high school campuses as well as at the seven campuses that offer a Futures Academy. In collaboration with Houston Community College, students in a Futures Academy are able to earn an associate's degree or nationally recognized industry certifications in high-demand technical fields.

When I Grow Up

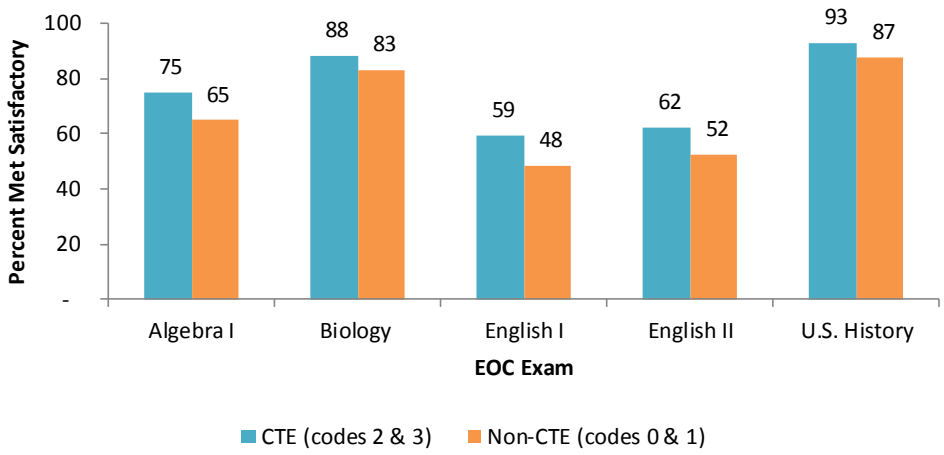
During the 2013–2014 school year, the CTE department held the first annual When I Grow Up Career Expo to allow area students to explore career options and develop an awareness of the opportunities available to them. The event included hands-on demonstrations, interactive presentations and competitions. This event was open to K-12 students, parents, and industry partners. The event was a way to highlight the accomplishments of CTE students as well as market the CTE program to HISD students, parents and community members. Over 120 businesses and 2000 families attended.

What were the academic performance results of students enrolled in the CTE program compared to HISD students districtwide over the past two school years, 2012–2013 and 2013–2014?

STAAR End-of-Course (EOC) Assessments

The academic performance results of ninth through twelfth-grade CTE students (codes 2 and 3 combined) compared to non-CTE students (codes 0 and 1) were measured using the STAAR End-of-Course exams in Algebra I, Biology 1, English I, English II, and U.S. History. **Figure 3** shows the percent of students that met the Satisfactory standard on the 2014 STAAR EOC assessments by CTE status and subject. Results are presented for the phase-in 1 standard.

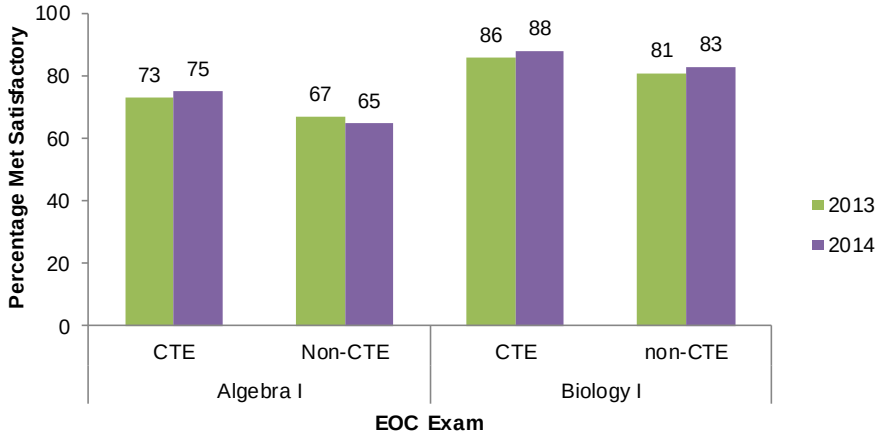
Figure 3. Percent met Satisfactory for CTE and non-CTE students on the EOC exams, spring 2014



- CTE students outperformed non-CTE students on the 2014 Algebra I EOC by ten percentage points (75 percent vs. 65 percent).
- The percentage of CTE students who met Satisfactory on the 2014 Biology EOC was five percentage points higher than the percentage of non-CTE students who met Satisfactory (88 percent vs. 83 percent).
- The percentage of CTE students who met Satisfactory on the 2014 English I EOC was eleven percentage points higher than the percentage of non-CTE students who met Satisfactory (59 percent vs. 48 percent). In addition, the percentage of CTE students who met Satisfactory on the 2014 English II EOC was ten percentage points higher than non-CTE students (62 vs. 52 percent).
- On the U.S. History EOC, the percentage of CTE students who met Satisfactory exceeded the percentage of non-CTE students who met the standard by six percentage points.
- Comparatively, **Tables 4a** and **4b** (**Appendix F**, p. 20) show the percent of CTE and non-CTE students who met the Satisfactory STAAR EOC standard by subject in 2013 and 2014. The percentages of CTE students compared to non-CTE students meeting the Satisfactory standard consistently were higher in Algebra I, Biology, as well as in all forms of English I, and English II in 2013 and 2014. **Figure 4** depicts a comparison of the 2013 and 2014 results on the Algebra I and Biology EOCs because these tests were administered in both years.
- Figure 4 shows that the percentage of CTE students meeting the Satisfactory standard increased from 2013 to 2014 in Algebra I (+2 percentage points), while the percentage of non-CTE students

meeting this standard on the exam decreased over the same time period (-2 percentage points). In addition, the percentage of CTE and non-CTE students meeting the Satisfactory standard in Biology increased by 2 percentage points.

Figure 4. Percent met satisfactory for CTE and non-CTE students on the EOC exams, spring 2013 and 2014



- When examining the performance of students meeting the Advanced standard on the EOC assessments in 2014, the percentages of CTE students who met the Advanced standard were higher than non-CTE students in Algebra I, Biology, and English I; lower in English II, and the same in U.S. History (Table 4a, page 20). The largest difference between the CTE and non-CTE students was in Biology I (11 percent vs. 9 percent). When considering EOC performance on comparable assessments in 2013, a higher percentage of CTE students compared to non-CTE students met the Advanced standard in Algebra I, Biology, English I – Reading, English I – Writing, and English II – Reading. English II – Writing was the only EOC presented where a higher percentage of non-CTE were assessed as Advanced (3 percent vs. 2 percent).
- **Table 5** (**Appendix G**, p. 21) presents the independent t-test analysis based on scale scores of CTE students and non-CTE students on the Algebra I EOC exam by grade level. There was a mean difference of 110.54 scale score points in favor of CTE students at the ninth grade, and a mean difference of 14.96 scale score points in favor of non-CTE students at tenth grade. Statistical significance was found at the ninth grade ($p < .0005$). In addition, eleventh-grade non-CTE students outperformed CTE students) on the Algebra I EOC (3415.79 vs. 3409.68 mean scale scores; however, the difference was not statistically significant.
- On the Biology I EOC exam (**Table 6**, p. 21), independent t-test analysis reflected a mean difference of 85.47 scale score points in favor of CTE students at the ninth grade, and a mean difference of 34.77 scale score points in favor of non-CTE students at the tenth grade. Statistical significance was evident at the ninth grade ($p < .0005$). Eleventh-grade CTE students outperformed non-CTE students on the Biology I EOC exam (3557.74 vs. 3529.69 mean scale scores); however, the difference was not statistically significant.
- Logistic regression analysis was conducted using Algebra I and Biology I EOC Satisfactory results as the dependent variables, and students' G/T, at risk, economic, gender, and special education classifications as independent variables. At risk, G/T, and special education

classifications made the largest contributions to CTE students' Algebra I and Biology I EOC performance. Specifically, the model revealed that G/T students were more likely to meet Satisfactory on the Algebra I and the Biology I EOC exams than non-G/T students. CTE students classified as special education and at-risk were less likely to meet Satisfactory on both the EOC exams than their counterparts (**Table 7**, p. 21).

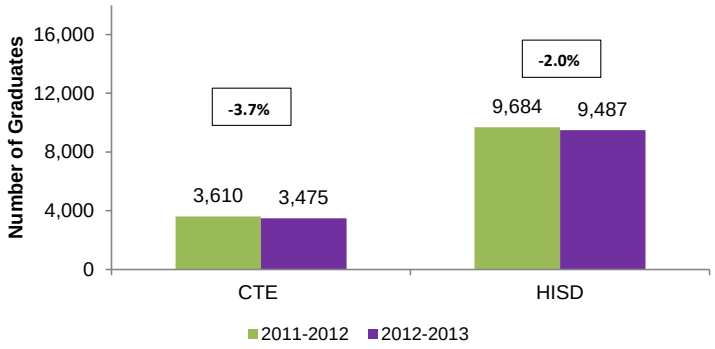
What were the graduation and annual dropout rates for students enrolled in the CTE program compared to HISD students districtwide over the past two years, 2011–2012 to 2012–2013?

Graduation Rates

The graduation counts for twelfth-grade students coded as CTE (codes 2 and 3 combined) from 2011–2012 to 2012–2013 are presented in **Figure 5**. Graduation rates for the 2013–2014 school year will be available in 2014–2015. Students who took CTE courses as general electives and who were coded as CTE 1 are not included.

- The total number of CTE graduates decreased over the two-year period, from 3,610 graduates in the spring of 2012 to 3,475 graduates in the spring of 2013 (3.7 percent). From spring 2012 to spring 2013, the number of HISD graduates also decreased from 9,684 to 9,487, which was a 2.0 percent decrease.

Figure 5. Number of CTE and HISD Graduates, Spring 2012 and Spring 2013



Twelfth-grade students earn one of three diploma distinctions based on the level and quantity of credits acquired during high school. These three diploma types are Regular/Minimum, Recommended, and Distinguished Achievement.

- In the spring of 2012, the largest percentage of CTE graduates (79.1 percent) earned the Recommended diploma distinction. This percentage was higher than the district in spring 2012 (73.6 percent). This trend remained stable in spring 2013, in that 79.7 percent of CTE graduates earned a Recommended diploma distinction compared to a lower percentage of students districtwide (71.6 percent) (**Appendix H**, **Table 8**, p. 22).

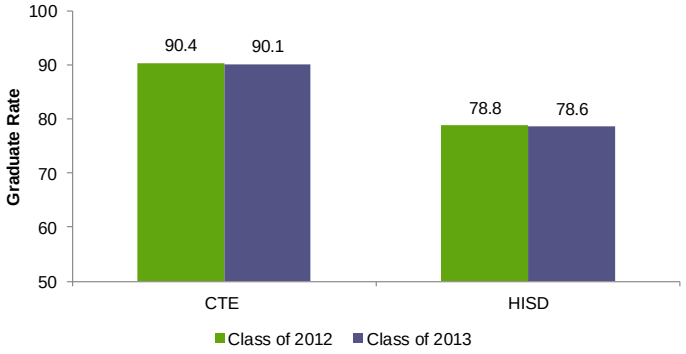
- There was a larger increase in the percentage of CTE students (3.9 percent vs. 5.9 percent) compared to students districtwide (6.1 percent vs. 6.7 percent) who earned the Distinguished Achievement diploma from 2012 to 2013.

Longitudinal Graduation Rates

The longitudinal graduation rate represents the percentage of students from a class of first-time ninth graders who complete their high school education by their anticipated graduation date (Texas Education Agency, 2011). **Figure 6** displays the four-year longitudinal graduation rates for CTE (codes 2 and 3 combined) and HISD students for the 2012 and 2013 graduating classes.

- The percentages of CTE students from the ninth-grade cohort graduating from high school in a four-year period slightly decreased from 2012 to 2013 (90.4 percent for the class of 2012 vs. 90.1 percent for the class of 2013). Similarly, the percentage of HISD students from the ninth-grade cohort graduating from high school in a four-year period slightly decreased (78.8 percent for the class of 2012 vs. 78.6 percent for the class of 2013). For each year displayed, the percentage of CTE students graduating from high school in the four-year period was at least 11.5 percentage points higher than that of the district.

Figure 6. CTE and HISD four-year longitudinal graduation rates based on ninth grade cohorts, 2011–2012 and 2012–2013†



†Source: TEA Completion, Graduation, and Dropout Report, 2014

Annual Dropout Rates

Figure 7 presents the annual dropout rates (grades 9 through 12) for CTE (codes 2 and 3 combined) and HISD students for the 2011–2012 and the 2012–2013 school years. The annual dropout rate (reported in percentages) is the number of students that dropped out of school in grades 9 through 12 in a particular school year divided by the number of students enrolled in that particular school year. Only students with PEIMS CTE status codes 2 (coherent sequence) or 3 (tech prep) are included in the calculation of this indicator[2].

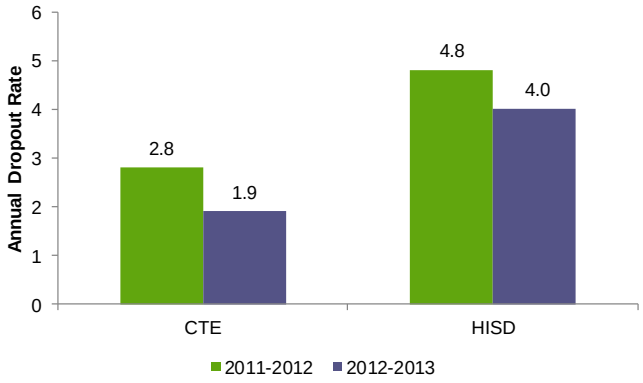
- From 2011–2012 to 2012–2013, the annual dropout rates of CTE and HISD students decreased, however, the annual dropout rates for CTE students remained lower than the annual dropout rates for HISD students.

[2] TEA Performance-Based Monitoring Analysis System Manual, 2014

- In 2011–2012, the annual dropout rate of the CTE students was 2.8 percent and decreased to 1.9 percent in 2012–2013. The annual dropout rates for HISD students was 4.8 percent in 2011–2012 and decreased to 4.0 percent in 2012–2013.

- There was a 0.9 percentage-point decrease in the annual dropout rate for CTE students compared to a 0.8 percentage-point decrease in the annual dropout rate for the district from the two year period.

Figure 7. CTE (2 and 3 combined) and HISD Annual Dropout Rates, Grades 9 through 12, 2011–2012 and 2012–2013†



†TEA Completion, Graduation, and Dropout Report, 2014

Discussion

The HISD CTE program offers career concentration courses and career pathways in which students are equipped with the academic and technical skills required to successfully enter the workforce and post-secondary education after high-school graduation. Many CTE students earn certifications and/or licensures as evidence of skill mastery in selected career concentrations. Participation in CTE student organizations fosters the development of leadership skills, while exposure to mentors and business partners provides guidance and practical experiences.

On the STAAR EOC assessments, larger percentages of ninth through twelfth-grade CTE students enrolled in career pathway courses met the Satisfactory and Advanced passing standard in Biology I, English I, English II, and U.S. History in 2014 compared to students not enrolled in CTE courses. The higher performance by CTE students supports the belief that involvement in the CTE program can be academically beneficial for students (Castellano, Sundell, Overman, and Aliaga, 2012). Further exploration of the data revealed that gifted/talented CTE students were more likely to achieve the Satisfactory standard on the Algebra I and Biology I EOC exams; whereas, students classified as special education and at risk were less likely to meet the Satisfactory standard. The report also noted the total number of CTE graduates decreased at a higher rate than the district from 2011–2012 to 2012–2013 (3.7 percent vs. 2.0 percent). Nevertheless, 37.3 percent of all HISD graduates were CTE students in 2011–2012; whereas, 36.6 percent of all HISD graduates were CTE students in 2012–2013. More importantly, there was a reduction in the gap between the percent of students who earned the Distinguished Achievement diploma over the two-year period, from 2.2 percentage points to .8 percentage points. Finally, the dropout rate for CTE students was lower in 2013 compared to 2014.

The CTE program aligns with HISD's strategic direction, which focuses on the core initiative: Rigorous Instructional Standards and Supports. Currently, the CTE program offers academic and technical curricula, career counseling, business partnerships, as well as out-of-classroom learning experiences and support for students. The CTE program must continue to commit to a variety of programming and opportunities for students to develop their career interests, knowledge, and skills.

References

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Appendix A

*PEIMS Data Standards – Career and Technical Education Indicator Codes

Code	Translation
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

*Retrieved from the Texas Education Agency on 9/9/2014

APPENDIX B
Career Concentrations and Related Courses*, 2013–2014

Career Concentration	Sample of Related Courses
Agriculture, Food & Natural Resources	Animal Science Horticulture Science and Landscape Design
Architecture & Construction	Construction Technology Piping Trades/Plumbing Mill and Cabinetmaking
Audio/Visual Technology and Communications	Advertising Design Arts AV Technology
Business, Management and Administration	Human Resources Business Management
Education and Training	Child Development Child Care and Guidance, Management, and Services
Finance	Accounting Banking and Financial Systems
Health Science	Health Science Technology Medical Terminology; Pharmacology
Hospitality and Tourism	Culinary Arts Hospitality Services Hotel Management
Human Services	Consumer and Family Economics Cosmetology Personal and Family Development
Information Technology	Business Computer Information Systems I Computer Maintenance Computer Programming
Law, Public Safety, Corrections and Security	Courts and Criminal Procedure Fire Fighter Emergency Communications
Manufacturing	Precision Manufacturing Welding
Marketing, Sales and Service	Retailing and E-tailing Entrepreneurship Marketing Dynamics
Science, Technology, Engineering and Mathematics	Robotics and Automation Electrical/Electronic Careers Engineering Design and Problem Solving
Transportation, Distribution and Logistics	Automotive Technician Global Supply and Distribution

*Complete listing of courses can be found at http://www.houstonisd.org/portal/site/CareerTech.

APPENDIX C

Table 1. Student Enrollment by CTE Codes, 2012–2013 through 2013–2014		
	2012–2013	**2013–2014**
Total HISD Student Enrollment (6th-12th)	87,418	90,630
	CTE Student Enrollment	
Number of CTE Students Coded 1	14,337	14,268
Number of CTE Students Coded 2	14,858	17,843
Number of CTE Students Coded 3	2,676	894
Total Number of CTE Students	**31,871**	**33,005**

Note: Data retrieved from TEA PEIMS, October 2013 and September 2014.

APPENDIX D

Table 2. District and CTE (Codes 1, 2, and 3) Course Enrollment by Student Groups*, 2012–2013 and 2013–2014

Subgroup	Academic Year			
	2012–2013		2013–2014	
	N	%	N	%
Total 6th through 12th Grade Student Enrollment	**87,418**	**100.0**	**90,630**	**100.0**
Gender				
Female	42,871	49.0	44,403	49.0
Male	44,547	51.0	46,227	51.0
Ethnicity				
American Indian	211	<1.0	212	<1.0
Asian	3,074	3.5	3,369	3.7
African-American	22,795	26.1	23,685	26.1
Hispanic	52,476	60.0	54,209	59.8
White	8,068	9.2	8,454	9.3
Two or More	668	<1.0	701	<1.0
Economically Disadvantaged	65,203	74.6	68,791	75.9
At Risk	43,481	49.7	51,937	57.3
Special Education	8,623	9.9	8,750	9.7
Limited English Proficiency	11,649	13.3	12,564	13.9
Gifted & Talented (G/T)	13,882	15.9	14,381	15.9
Total CTE Student Enrollment	**32,955**	**100.0**	**33,005**	**100.0**
Gender				
Female	16,157	49.0	16,193	49.1
Male	16,798	51.0	16,812	50.9
Ethnicity				
American Indian	108	<1.0	81	<1.0
Asian	981	3.0	1,054	3.2
African-American	9,592	29.1	9,285	28.1
Hispanic	19,898	60.4	20,304	61.5
White	2,140	6.5	2,112	6.4
Two or More†	169	<1.0	169	<1.0
Economically Disadvantaged	24,839	75.4	25,278	76.6
At Risk	21,049	63.9	19,802	60.0
Special Education	2,955	9.0	2,735	8.3
Limited English Proficiency	2,762	8.4	5,188	15.7
Gifted & Talented (G/T)	4,347	13.4	5,024	15.2

Note: 2013–2014 data retrieved from TEA PEIMS, September 9, 2014; previous year data obtained from 2012–2013 HISD CTE Program Evaluation.

* District enrollment numbers reflect only students in grades 6 through 12, grades where students are also enrolled in CTE courses.

APPENDIX E

Table 3. Certifications /Licenses Earned by CTE 2 and CTE 3 Students, 2013–2014

Certification	Earned	Certification	Earned
A+ Certification	15	MOS - EXCEL	8
Adult CPR/AED	210	MOS - OUTLOOK	3
ASE Auto Maintenance and Light Repair	81	MOS - POWERPOINT	161
ASE Brakes (A5)	74	MOS - WORD	186
ASE Certified Oil Change Mechanic	182	MTA Networking	6
ASE Heating and Air Conditioning (A7)	37	MTA Security	5
ASE Suspension and Steering (A4)	61	MTA Windows OS	2
Automated External Defibrillator	34	NATEF Automotive Technician	0
Automotive Technician Standard Assessment	0	NATEF Brakes (A5)	43
Basic Municipal or County Jailer	21	NCCER CORE Introductory Craft Skills	10
Basic Property Room Technician	18	Network+ Certification	6
Basic Telecommunication	22	NIJ Basic	64
Cosmetology Operators License	17	NIJ DNA	67
CPR Lay Responder Adult and Child	274	OSHA Ten Hour Safety Certification	321
CPR Lay Responder Infant	137	School Safety & Violence Prevention	22
Criminal Justice Assessment	12	ServSafe© Certification	99
Digital Forensics Basics	3	SP/2 Collision Pollution Prevention	81
Digital Literacy	629	SP/2 Collision Safety	182
Everfi Alcohol Education	112	SP/2 Hazardous Materials Training-Auto Dealer	49
EverFi Certified	325	SP/2 Heavy-Duty Fleet Pollution Prevention	80
Everfi Financial Literacy	**795**	SP/2 Heavy-Duty fleet safety	80
Everfi Ignition	461	SP/2 Mechanical Pollution Prevention	154
Everfi Radius	5	SP/2 Mechanical Safety	284
First aid Certification	543	SP/2 Supervisor course	80
First Responder Certification	23	Strata	8
Heartsaver	21	TEEN COMMUNITY EMERGENCY RESPONSE TEAM	30
IC3	1	TEEX Cyber Ethics	2
Information Security Basics	63	TEEX Death Investigation	37
Information Security for Everyone	39	TEEX Digital Forensics Basics	1
Microsoft Office Expert - Excel	3	TEEX Information Security Basics	29
Microsoft Office Expert - Word	3	TEEX Information Security for Everyone	16
Microsoft Office Master	3	TEEX Network Assurance	5
MOS - ACCESS	2	Terrorism Awareness for Emergency 1st Response	16
		Totals:	**4,226**

APPENDIX F

Table 4a. Percent Met Satisfactory and Advanced by STAAR EOC Subject and CTE Status, Spring 2014				
		N Tested	% Satisfactory	% Advanced
	EOC	2014	2014	2014
CTE (codes 2 & 3)	Algebra I	3,591	75	8
	Biology	4,491	88	11
	English I	5,804	59	6
	English II	5,498	62	4
	US History	4,542	93	15
Non-CTE (codes 0 & 1)	Algebra I	6,686	65	6
	Biology	5,219	83	9
	English I	6,108	48	5
	English II	4,233	52	5
	US History	2,594	87	15

Table 4b. Percent Met Satisfactory and Advanced by STAAR EOC Subject and CTE Status, Spring 2013				
		N Tested	% Satisfactory	% Advanced
	EOC	2013	2013	2013
CTE (codes 2 and 3)	Algebra I	2,908	73	7
	Biology	4,084	86	13
	English I-Reading	4,408	67	11
	English I-Writing	3,186	71	3
	English II-Reading	4,344	77	19
	English II-Writing	4,355	50	2
Non-CTE (codes 0 & 1)	Algebra I	5,724	67	5
	Biology	7,816	81	11
	English I-Reading	8,027	56	8
	English I-Writing	8,223	40	2
	English II-Reading	5,802	67	16
	English II-Writing	5,824	42	3

APPENDIX G

Table 5: STAAR Algebra I EOC Independent T-test Analysis of CTE (2 and 3) with Non-CTE Students*

	Group	n	Mean	SD	Mean Diff.	t	p
9	CTE	2930	3825.56	388.10	110.54	12.57	.000***
	Non-CTE	5844	3715.02	388.70			
10	CTE	351	3390.11	242.92	-14.96	-.840	.401
	Non-CTE	774	3405.07	290.83			
11	CTE	109	3409.68	305.26	-6.11	-.183	.855
	Non-CTE	306	3415.79	296.90			

*Grade 12 did not have sufficient number of CTE students to conduct the analysis. Regular STAAR (Test Version S)

Note: *p < .05, ** p < .01, ***p< .0005

Table 6: STAAR Biology I EOC Independent T-test Analysis of CTE (2 and 3) with Non-CTE Students*

	Group	n	Mean	SD	Mean Diff.	t	p
9	CTE	4006	4010.37	435.95	85.47	9.847	.001**
	Non-CTE	7545	3924.90	448.26			
10	CTE	212	3516.16	270.17	-34.77	-1.356	.176
	Non-CTE	202	3550.94	330.22			
11	CTE	78	3557.74	288.28	28.06	.838	.403
	Non-CTE	106	3529.69	257.14			

*Grade 12 did not have sufficient number of CTE students to conduct the analysis. Regular STAAR (Test Version S)

Note: *p < .05, ** p < .01, ***p< .0005

Table 7. Logistic Regression Analysis Predicting 2014 STAAR Algebra I and Biology EOC Performance of Ninth through Twelfth Grade CTE (code 2 and 3) Students

	Algebra I (n= 3,361)				Biology (n = 4,272)			
	β	*SE*	*Odds Ratio*	*Wald Statistic*	*β*	*SE*	*Odds Ratio*	*Wald Statistic*
Economically disadvantaged	.185	.117	1.204	2.485	-.370	.160	1.447	5.322*
Gender	-.264	.087	.768	9.185**	.243	.104	1.275	5.424*
At Risk	1.962	.141	7.114	193.829***	2.626	.214	13.825	150.111***
G/T	-2.029	.366	.131	30.752***	-2.460	.508	.085	23.410***
Special Education	1.621	.169	5.058	92.093***	1.538	.178	4.656	74.869***

Note: *p < .05, ** p < .01, ***p< .0005; Algebra 1 – X^2 (5, N = 3,361) = 575.86 ; Biology – X^2 (5, N = 4,272) = 626.90

APPENDIX H

Table 8. Percent of CTE Graduates by Diploma Type, Spring 2012 and Spring 2013

CTE Code	Type of Diploma	2012		2013	
		N	%	N	%
2 and 3	Completion of Individualized Education Plan	140	3.9	22	0.6
	Regular/Minimum	474	13.1	479	13.8
	Recommended	2,856	79.1	2,770	79.7
	Distinguished Achievement	140	3.9	204	5.9
	Total	3,610	100.0	3,475	100.0
HISD	Completion of Individualized Education Plan	600	6.2	349	3.7
	Regular/Minimum	1,362	14.1	1,705	5.6
	Recommended	7,126	73.6	6,796	71.6
	Distinguished Achievement	596	6.1	637	6.7
	Total	9,684	100.0	9,487	100.0

Note: HISD graduates obtained from Fall Collection, Resubmission, PEIMS Edit + Reports