MEMORANDUM June 2, 2009

TO: Board Members

FROM: Abelardo Saavedra
Superintendent of Schools

SUBJECT: **CAREER AND TECHNICAL EVALUATION REPORT**

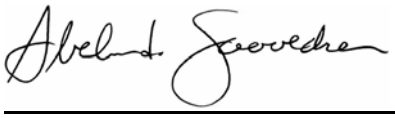
CONTACT: Carla Stevens, (713) 556-6700

Attached is the 2007–2008 evaluation report on the Career and Technical Education (CTE) program implemented in the district. This report assesses the program participation and academic performance of participants from the past three years, 2005–2008. This report also includes a summary of the course offerings and program components implemented in the CTE program.

Over the past three years, 2005–2008, the number of students enrolled in the CTE 2 (coherent sequence) and the CTE 3 (Tech Prep) courses increased by 2.4% and 24.8%, respectively. Approximately, one hundred and sixty-five different CTE courses offered at 67 schools (29 high schools and 38 middle schools) throughout the district in 2007–2008.

Over the three-year period, the passing rate for students enrolled in CTE courses on the math section of the TAKS increased by 6.4 percentage points, with 55.4% passing in spring 2006 to 61.8% passing in spring 2008. The passing rate for students enrolled in CTE courses on the reading/ELA section of the TAKS increased from 79.4% in spring 2006 to 82.3% in spring 2008, an improvement of 2.9 percentage points.

Should you have any further questions, please contact my office or Carla Stevens in Research and Accountability at (713) 556-6700.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cc: Superintendent's Direct Reports
Regional Superintendents
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Elizabeth Seaton

RESEARCH

Educational Program Report

HOUSTON Independent School District

Creating a College-Bound Culture

Career and Technical Education
2007–2008

Department of Research and Accountability
Houston Independent School District

HOUSTON
Independent School District

Creating a College-Bound Culture

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EXECUTIVE SUMMARY

CAREER AND TECHNICAL EDUCATION
2007– 2008

Program Description

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. Consequently, the goals of the CTE program are: (1) to provide students with relevant and up-to-date instruction within their career pathway (s) of interest, (2) to offer an advanced curriculum that can lead to industry certifications, (3) to expose students to out-of-classroom and real-world work experiences, and (4) to implement professional development that focuses on best practices in career and technical education. By enrolling in CTE courses and participating in CTE program components, students are empowered to strengthen the economic and social foundation of the local community and beyond.

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 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. 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. Students who select a coherent sequence of courses are coded as CTE 2 participants and those with an interest in technical fields can enroll in the Tech Prep program (coded as CTE 3 participants).

The Texas Education Agency (TEA) has identified the following career concentrations:

- Agriculture, Food and Natural Resources;
- Architecture and Construction;
- Audio/Visual Technology and Communications,
- Business, Management, and Administration;
- Education and Training;
- Finance;
- Government and Public Administration;
- Health Science;
- Hospitality and Tourism;
- Human Services;
- Information Technology;
- 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 TEA envisions a comprehensive plan of action for CTE that acknowledges the fact that the state is facing a time of great demographic and economic change. The public education systems must take immediate action by addressing the following challenges:
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> - Recognize the unique needs of a diverse student population;
> - Prepare students for college and career success;
> - Provide students with a quality education that prepares them to be competitive within a global economy; and
> - Recruit and retain qualified teachers." (CTE State Plan, 2007, p.2)

The State Plan for Career and Technical Education, 2008–2013 (referred to as 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 technology education should complement and enhance academic preparation by enabling students to apply learned principles to a variety of family, community, and career situations.

Purpose of Evaluation

The purpose of this evaluation report was to summarize the CTE program components and course offerings. In addition, demographic characteristics, test performance, and graduation rates were presented for students enrolled in CTE courses over the last three school years, (2005–2006 through 2007–2008).

The following evaluation questions were addressed:

1. What were the demographic characteristics of students enrolled in the CTE program over the past three years, 2005–2008?
2. What were the CTE program components and course offerings implemented in HISD?
3. What were the trends in Texas Assessment of Knowledge and Skills (TAKS) performance of students enrolled in the CTE program over the past three years, 2005–2008?
4. What were the graduation rates of twelfth-grade students enrolled in the CTE program over the past three years, 2005–2008?

Findings

1. What were the demographic characteristics of students enrolled in the CTE program over the past three years, 2005–2008?

   Over the past three years, student enrollment in the district has steadily declined from 210,292 students in 2005–2006 to 199,534 students in 2007–2008, a decrease of 5.1%. In line with districtwide trends, the CTE program experienced a reduction in enrollment of 7.8%, from 38,570 students in 2005–2006 to 35,638 students in 2007–2008. For the three-year period, the number of students enrolled in CTE 1 courses as elective-takers decreased by 13.2%, while the students enrolled in CTE 2 (coherent sequence) and CTE 3 (Tech Prep) courses increased by 2.4% and 24.8%, respectively.

2. What were the CTE program components and course offerings implemented in HISD?

- One hundred and sixty-five different CTE courses were offered at 67 schools (29 high schools and 38 middle schools) throughout the district. These courses cover the career concentrations (listed on page 1) identified by the TEA. The CTE program provides students opportunities to learn about their career pathways within the classroom setting and through internships in work-based learning environments.

- The HISD CTE program has developed several relationships with local and national professional organizations. Students are encouraged to join career and technical student organizations (CTSO) to learn about their career interests from professionals within the industry. By participating in CTSOs, students are also able to demonstrate their mastery, skills, and knowledge through competitions with other students from other districts, regions, and states. These learning experiences further expose students to options within their selected career pathways and expand their communication and leadership skills.

3. What were the trends in Texas Assessment of Knowledge and Skills (TAKS) performance of students enrolled in the CTE program over the past three years, 2005–2008?

- There has been a steady increase in the passing rates of all students enrolled in the CTE program on the mathematics, reading, science, and social studies TAKS subtests. Over the three-year period, the passing rate for CTE program students on the math section of the TAKS increased by 6.4 percentage points, with 55.4% passing in spring 2006 to 61.8% passing in spring 2008. The passing rate for students enrolled in CTE courses on the reading/ELA section of the TAKS increased from 79.4% in spring 2006 to 82.3% in spring 2008, an improvement of 2.9 percentage points. For the same three-year period, CTE program students also increased their performance on the science and social studies subtests, with increases of 12.7 and 6.6 percentage points, respectively.

- CTE TAKS passing rates by student population met or exceeded the state's Performance-Based Monitoring Analysis System (PBMAS) standards in all subjects for economically-disadvantaged students and students in the tech Prep program. Limited English Proficiency (LEP) CTE students met required improvement in all subjects. Special education CTE students met the standards for science and social studies but not math and reading/ELA.

4. What were the graduation rates of twelfth-grade students enrolled in the CTE program over the past three years, 2005–2008?

   The total number of CTE program graduates increased over the three-year period, starting with 5,257 graduates in the spring of 2006 to 5,387 graduates in the spring of 2008. The number of twelfth-grade graduates participating in CTE courses also increased with 42.5% of HISD graduates coded in the program as CTE 2 or CTE 3 students in the spring of 2008.

Recommendations

1. Continue to provide program offerings and components across the career concentrations so that CTE program students can select interests from a variety of career pathways and participate in multiple career development experiences. The amount of diverse programming available for students encourages career exploration and helps students to develop an awareness of their future career options. Given the success of the CTE EXPO, program personnel should continue to expand this program component. In addition to providing a platform for CTE students to display their work from their career-related courses, the EXPO serves as an advertisement of the program offerings within the CTE program. To greater promote the CTE program, parents and students from all elementary and middle schools should be invited to the CTE EXPO to expose younger students to CTE courses earlier in their academic endeavors. CTE administrators should consider holding the EXPO on at least one school day so that district teachers could bring students for an out-of-classroom learning experience.

2. Considering the increase in the number of CTE 2 and CTE 3 graduates and the mission to equip students for training beyond high school, a database system should be developed in order to track the progress of CTE program graduates once they leave the district. One method to consider is a former student website so that CTE graduates could report completion of college, technical programs, and/or share career achievements. Since the CTE program seeks to help students prepare for post-secondary education and the world of work, maintaining a connection to former students could highlight the long-term benefits of CTE program participation in HISD.

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2007– 2008

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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 department also 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 participants and those with an interest in technical fields can enroll in the Tech Prep program (coded as CTE 3 participants). 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. The Texas Education Agency (TEA) has identified the following career concentrations:

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- Education and Training;
- Finance;
- Government and Public Administration;
- Health Science;
- Hospitality and Tourism;
- Human Services;
- Information Technology;
- Public Safety, Corrections, and Security;
- Manufacturing;
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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.

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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.

Purpose of Evaluation

The purpose of this evaluation report was to summarize the CTE program components and course offerings. In addition, demographic characteristics, test performance, and graduation rates were presented for students enrolled in CTE courses over the last three school years, (2005–2006 through 2007–2008).

The following evaluation questions were addressed:

1. What were the demographic characteristics of students enrolled in the CTE program over the past three years, 2005–2008?
2. What were the CTE program components and course offerings implemented in HISD?
3. What were the trends in Texas Assessment of Knowledge and Skills (TAKS) performance of students enrolled in the CTE program over the past three years, 2005–2008?
4. What were the graduation rates of twelfth-grade students enrolled in the CTE program over the past three years, 2005–2008?

Program Personnel

Currently, the CTE program utilizes HISD central office administrative staff to support instructional services in line with the career clusters of AchieveTexas (four content area specialists, each supporting four career clusters). The staff includes a technical writer and a project manager. Additionally, there is a director, a curriculum manager, a data quality manager, and a manager of Career Clusters and Workforce

Development. Four hundred and four instructors teach CTE courses in HISD and fifteen counselors help students with job placements. A part-time recruiter helps to find and retain CTE teachers. Four administrative support staff members assist in fulfilling the clerical responsibilities necessary to operate the program.

Program Funding

The CTE program is funded through the Carl D. Perkins Vocational and Technical Education Act of 1998. Texas' Perkins funds enhance the state's efforts to ensure that students pursue a rigorous course of study by providing support for districts to implement programs such as Project Lead the Way, and the Advanced Technical Credit statewide articulation program. Local education agencies, including HISD, who accept Perkins funds, must utilize those funds to conduct the following activities:

- Strengthen the academic and technical skills of CTE students by integrating academics with CTE programs through a coherent sequence of courses;
- Provide students with strong experience and understanding of all aspects of an industry;
- Develop, improve, or expand the use of technology in CTE, through training of personnel to use state-of-the art technology; providing CTE students with the academic and technical skills to entry into the high technology and telecommunications fields; or encouraging schools to work with high technology industries that offer voluntary internships and mentoring programs;
- Provide professional development programs to teachers, counselors, and administrators in state-of-the-art CTE programs and techniques;
- Initiate, improve, expand, and modernize quality career and technology programs;
- Provide services and activities that are of sufficient size, scope, and quality to be effective;
- Link secondary career and technical education and postsecondary career and technical education, including implementing tech prep programs; and
- Develop and implement evaluations of the vocational and technical education programs carried out with funds under this title, including an assessment of how the needs of special populations are being met (CTE State Plan, 2007).

Methods

Data Collection

Qualitative data, including student demographic characteristics 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 CTE courses as part of a state approved Tech Prep plan of study received a code of 3. Enrollment numbers were collected based on total CTE participation as well as by code participation. Twelfth-grade graduation rates were gathered from Texas Education Agency's district graduation files. In addition to PEIMS data, qualitative data was obtained through discussions with CTE personnel and the Career and Technical Education website (http://www.houstonisd.org/portal/site/CareerTech) provided details about the program and curriculum.

Quantitative analysis was accomplished using results obtained from the Texas Assessment of Knowledge and Skills (TAKS) database. TAKS results were used in this report since it is a criterion-referenced test, specifically developed to reflect good instructional practices and to measure student learning. TAKS is vertically aligned with the Texas Essential Knowledge and Skills (TEKS) curriculum. TAKS performance results were also acquired from the Texas Education Agency's Performance-Based Monitoring Analysis System (PBMAS).

Results

What were the demographic characteristics of students enrolled in the CTE program over the past three years, 2005–2008?

The HISD enrollment numbers and CTE student enrollment by code numbers are shown in **Table 1**. Over the past three years, student enrollment in the district has steadily declined from 210,292 students in 2005–2006 to 199,534 students in 2007–2008, a decrease of 5.1%. The CTE program experienced a reduction in enrollment of 7.8%, from 38,570 students in 2005–2006 to 35,638 students in 2007–2008.

The number of students enrolled in CTE 1 courses as elective-takers decreased from 24,913 in 2005–2006 to 21,618 in 2007–2008, which was a 13.2% decline. During the same time period, the numbers of CTE 2 students fluctuated, starting at 13,532 in 2005–2006 to 15,045 in 2006–2007, and then down to 13,864 in 2007–2008. For the CTE 2 student enrollment, there was an overall increase of 2.4% from 2005–2006 to 2007–2008. The number of CTE students coded in the Tech Prep program (code = 3) also fluctuated, showing an increase from 125 in 2005–2006 to 156 in 2007–2008.

Table 2 (see page 9) presents the district and CTE enrollment of students by subgroups. According to Table 2, the percentage of at-risk students within the district has slightly decreased from 2005–2006 to 2007–2008 (67.1% to 65.0%). The percentage of at-risk students enrolled in CTE courses also decreased but at a greater rate during this three-year period (74.4% to 63.7%). A similar trend was found among special education students. From 2005–2008, the district's percentage of special education students decreased from 9.8% to 9.1%; while the percentage of students enrolled in CTE courses who received special education services decreased from 11.5% to 10.7%. It should be noted that the CTE enrollment percentage of special education students for 2007–2008 is higher than the districtwide percentage (10.7% vs. 9.1%). The percentage of students identified as LEP districtwide increased over the three school years, starting at 27.9% in 2005–2006 and increasing to 29.7% in 2007–2008. During the three-year period, the percentage of students identified as LEP within CTE courses remained nearly the same (9.7% to 9.8%). For 2007–2008, the percentage of LEP students enrolled in CTE courses was 19.9 percentage points less than the district's LEP percentage enrollment (9.8% vs. 29.7%). The district enrollment of students identified as gifted and talented increased from 11.1% in 2005–2006 to 12.0% in 2007–2008. The percentage of students enrolled in CTE courses identified as gifted and talented increased from 9.9% in 2005–2006 to 12.4% in 2006–2007 and then decreased to 11.6% in 2007–2008. However, over the three-year period, the percentage of CTE enrolled students identified as gifted and talented increased 1.7 percentage points.

Table 1. Student Enrollment and Student by CTE Codes, 2005–2006 through 2007–2008

	2005–2006	2006–2007	2007–2008
Total HISD Student Enrollment	210,292	202,936	199,534
Number of CTE Students Coded 1	24,913	22,534	21,618
Number of CTE Students Coded 2	13,532	15,045	13,864
Number of CTE Students Coded 3	125	79	156
Total Number of CTE Students	38,570	37,658	35,638

Note: Data retrieved from TEA PEIMS, 2005–2008

Table 2. District and CTE Course Enrollment by Subgroups, 2005–2006 Through 2007–2008

Subgroup	Academic Year					
	2005–2006		2006–2007		2007–2008	
	N	%	N	%	N	%
Total HISD Student Enrollment	210,292	100.0	202,936	100.0	199,534	100.0
Gender						
Female	103,047	49.0	99,412	49.0	97,827	49.0
Male	107,245	51.0	103,524	51.0	101,707	51.0
Ethnicity						
American Indian	126	.1	139	.1	146	.1
Asian	6,525	3.1	6,368	3.1	6,365	3.2
African-American	63,063	30.0	59,274	29.2	56,678	28.4
Hispanic	122,603	58.3	120,354	59.3	120,327	60.3
White	17,975	8.5	16,801	8.3	16,018	8.0
Economically-Disadvantaged						
Yes	171,901	81.7	158,286	78.0	158,307	79.3
No	38,391	18.3	44,650	22.0	41,227	20.7
At Risk	141,076	67.1	134,139	66.1	129,660	65.0
Special Education	20,508	9.8	20,226	10.0	18,232	9.1
Limited English Proficiency	58,723	27.9	55,461	27.3	59,168	29.7
Gifted & Talented (G/T)	23,440	11.1	24,378	12.0	23,865	12.0
Total CTE Student Enrollment	38,570	100.0	37,658	100.0	35,638	100.0
Gender						
Female	19,305	50.1	18,775	49.9	17,751	49.8
Male	19,265	49.9	18,883	50.1	17,887	50.2
Ethnicity						
American Indian	20	.1	27	.1	25	.1
Asian	105	2.7	1,027	2.7	1,084	3.0
African-American	14,147	36.7	13,063	34.7	12,157	34.1
Hispanic	20,717	53.7	21,009	55.8	19,836	55.7
White	2,631	6.8	2,532	6.7	2,536	7.1
Economically-Disadvantaged						
Yes	29,841	77.4	26,271	69.8	25,619	71.9
No	8,729	22.6	11,387	30.2	10,019	28.1
At Risk	28,682	74.4	26,532	70.4	22,706	63.7
Special Education	4,424	11.5	4,393	11.7	3,799	10.7
Limited English Proficiency	3,727	9.7	3,475	9.2	3,506	9.8
Gifted & Talented (G/T)	3,814	9.9	4,661	12.4	4,121	11.6

Note: Data retrieved from TEA PEIMS, 2005–2008

What were the CTE program components and program offerings implemented in HISD?

The HISD CTE program consists of several components and course offerings that give HISD students opportunities to explore career options and gain preparation for the world of work and post-secondary education. The CTE program components insure that all CTE students develop career awareness within their selected course of study as well as are exposed to professional experiences to enhance their mastery, confidence, and leadership skills.

In addition to the program components, the CTE department offers a variety of programs from which students can select a career pathway of study. Career pathways provide a plan for all students, regardless of their abilities, talents, or desired levels of education. Career concentration pathways provide all students with areas of focus, along with flexibility, and a variety of ideas to pursue as they make decisions regarding course selection. By taking CTE courses, students are given opportunities to participate in hands-on training within their career pathway of interest. The CTE program components include the following (listed alphabetically):

Certifications/Licenses

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 give students a sense of accomplishment, a highly-valued professional credential, and help them become more employable and eligible for higher starting salaries. There are over 90 professional certificates or licenses that are approved by TEA in which CTE high school students can earn. These certifications/licenses are connected to multiple industry careers such as beauticians, automotive mechanics, and several business-related fields.

Career & 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). For the 2007–2008 school year, Johnston Middle School was recognized as the largest middle school chapter of the Business Professionals of America in the state of Texas.

As a part of student organizations, 437 students participated in University Interscholastic League (UIL) and CTSO competitions throughout the district, state, and at the national levels. In the spring of 2008, Westside's culinary arts students participated in the district's SkillsUSA's culinary arts competition and won first, second, third, and fourth places. One Westside student won 4th place in the state's SkillsUSA's culinary arts competition and three students won scholarships to the Culinary Institute of America (http://hs.houstonisd.org/WestsideHS/academics/entrepreneurship.html).

College Credit for CTE Students

There are three different kinds of courses that CTE students can take in order to earn college credit, dual credit courses, advanced technical credit courses, or Tech Prep courses. Students within these courses are taught and graded in the same manner as college students who would take the course. 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. For the 2007–2008 school year, 1,873 CTE students were enrolled in dual credit courses.

Advanced technical credit (ATC) courses are developed at the state level, while Tech Prep credit courses are developed within HISD. Both types of courses are taught by local high-school teachers who received specialized training. College credit for ATC and Tech Prep 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. More than one-fourth of CTE teachers in Houston ISD were ATC-certified in 2007–2008.

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 2007–2008 school year. Several students attending the High School for Law Enforcement and Criminal Justice had job shadowing experiences at the Houston Emergency Center.

CTE Expo

During the 2007–2008 school year, the CTE department determined that students needed a showcase to demonstrate the skills, knowledge and products they produced within their CTE courses. Hence, the first CTE EXPO was held for three days in January 2008 at the Hattie Mae White Educational Center. The EXPO included health and science exhibits, auto technology hands-on demonstrations, a fashion show, a robotics obstacle course, computer maintenance competitions, livestock judging, and an agriculture auction. This event was open to students, parents, and industry partners. The event was a way to highlight students and market the CTE program to community members.

Tech Prep

The Tech Prep program provides a way for students to start their technical careers in high school and complete their training in a local community college. The six-year program is a combination of four years of high school courses, outlined in the Recommended graduation plan, and two years in a technical training program at a participating community college. The program prepares students for high-demand technical careers. At the end of the program, Tech Prep students can earn an Associate of Applied Science degree.

Program Offerings

One hundred and sixty-five different CTE courses are offered at 67 HISD schools (29 high schools and 38 middle schools) throughout the district. These courses range from accounting to welding and are related to the career concentrations identified by TEA (listed on page 5). A partial listing of the CTE courses being offered in the district can be found in the **Appendix**. The CTE program provides a variety of courses for students to select elective classes and/or courses within career concentrations. A full description of all CTE classes and the school locations, where each class is available can be found in the curriculum section at the Career and Technical Education website. These courses are taken as electives or as part of a selected career concentration. (http://www.houstonisd.org/portal/site/CareerTech)

The CTE specialized career programs include the following (listed alphabetically):

Agricultural Science and Technology

The Agricultural Science and Technology (AST) program has developed as an integral part of the CTE department in HISD. The mission of the program is to prepare students for careers, build awareness, and develop leadership for the food, fiber, and natural resource systems. Diverse course offerings make it attractive to students with varying educational goals. The AST program operates at eight high schools. These locations are Austin, Bellaire, Chavez, Lamar, Madison, Sam Houston, Worthing, and Yates. In addition, Harper Alternative School provides horticulture courses for students with disabilities. The AST program owns six farms. The farms are located near participating schools and vary in size: Madison has 35 acres, Austin and Yates share 62 acres, Bellaire, Lamar, and Lee have a total of 40 acres, and Sam Houston has 9 acres. The co-curricular activities for the AST program include membership in the student organization, Future Farmers of America (FFA), and participation in the Houston Livestock Show.

Automotive Youth Educational Systems (AYES)

Within the AYES program, HISD students are taught entry-level skills in the field of automotive technology. Students take courses in a coherent sequence to increase their levels of expertise in automotive technology. The program is a collaborative initiative between HISD and automotive industry partners such as local automotive dealerships and independently-owned repair shops. These automotive partners provide job-shadowing opportunities and apprenticeships to HISD students to gain real-world, on-the-job experiences in the AYES program. The AYES program is available at Westbury High School and Waltrip HS. These schools have automotive labs that are certified by the National Automotive Technology Education Foundation (NATEF) and hold Automotive Service Excellence (ASE) certifications.

Business, Management, and Administration

The Business, Management, and Administration career concentration is divided into six pathways, including management, business financial management and accounting, human resources, business analysis, marketing, administration, and information support. Within these pathways, students learn about planning, organizing, directing, and evaluating business functions essential to efficient and productive business operations. The courses help students develop the skills and knowledge to conduct business in the workplace and/or pursue education in business fields. Courses in business, management, and administration are offered at all HISD high schools.

Construction Careers

Students interested in careers in the construction industry have several school choices within HISD. The Construction, Art, Science and Technology (CAST) Academy is offered at Furr HS. This program is supported by the Association of General Contractors (AGC) to assist with the development of the construction workforce in the Greater Houston area. There are also Construction Academies located at Austin and Yates High Schools. Construction trade education helps students develop manipulative skills, safety, judgment, technical knowledge, and relate occupational information. Construction courses are designed to train students through contextual instruction in the layout, design, production and processing, assembling, testing, diagnosing and maintaining industrial, commercial and residential goods and services. Students are also provided opportunities to develop and apply leadership, social, civic and business-related skills through their involvement in the Vocational and Industrial Clubs of American (VICA), which is the student organization for young people enrolled in the Trade and Industrial programs. Basic Safety, Introduction to Construction Math, Introduction to Hand Tools, Introduction to Power Tools, Introduction to Blueprints, Basic Communications Skills, and Basic Employability Skills

are among course offerings. The Houston Community College System partners with HISD to support students within the construction programs.

Culinary Arts Programs

Culinary arts programs are available at Barbara Jordan, Davis, Wheatley, and Westside high schools and Harper Alternative School. The programs are designed to prepare students for career opportunities in the food service and hospitality industries. Culinary arts students train in specific culinary areas of interest, work toward receiving post-secondary credit, and enter the Chef Apprenticeship program, affiliated with the American Culinary Federation (ACF). In spring 2008, students at Barbara Jordan High School catered the prom for a large high school in the Humble Independent School District.

At Jefferson Davis High School, a hotel and restaurant management magnet program is offered along with a culinary arts component. At Davis, students interested in the tourism and hospitality industry, learn a variety of business management and culinary arts skills. Twelfth-grade students can participate in an internship program at the University of Houston. At Westbury, culinary arts students take courses related to the entrepreneurship side of culinary arts as well as food preparation lessons. HISD partnered with the Texas Restaurant Association. As a result, Westside has a fully operational Outback Restaurant.

DeBakey's College Preparatory School

The DeBakey's College Preparatory School, a component of the Health Sciences Department of CTE, allows students to take four years of sequenced health science classes. All health science teachers at the DeBakey School are CTE certified in order to teach the courses. The Health Science Curriculum consists of the following courses by grade level: Introduction to Health Science for ninth graders; Anatomy and Physiology for tenth graders; Health Science Rotations: Dental Science, Medical Laboratory, and Patient Care for eleventh graders; and Health Science III- Hospital Internships, Advanced Anatomy and Physiology, Rehabilitation Rotations and Business Computer Information Systems for twelfth graders. Junior and senior students intern at the Texas Medical Center to complete rotation components. At the end of four years, students are awarded a Health Science Certificate. DeBakey's College Preparatory School allows students to receive a well-rounded CTE foundation in the health sciences curriculum along with core academic classes.

Energy Industry Programs

There are three energy academies in HISD. These academies offer courses in which CTE students can develop their interests in careers related to the energy industry. These academies are located at Milby High School (Milby Academy for Petroleum Exploration & Production Technology), Lamar High School (Lamar Global Energy Business Program), and Westside High School (Westside Engineering & Geosciences Academy). The energy academies are financially supported by the Independent Petroleum Association of America (IPAA) to assist with developing an energy workforce in Houston.

The High School for Law Enforcement & Criminal Justice (H.S. LE/CJ)

The H.S. LE/CJ**,** a separate and unique magnet school, began in the spring of 1981 as a recruitment source for minority police officers. Currently, the curriculum is designed to allow students to explore careers related to law enforcement and criminal justice. Entry requirements include an 80 average in academic subjects, passing scores on standardized tests, and good conduct grades.

At the High School for Law Enforcement & Criminal Justice, students take vocational classes at each grade level to expose them to the skills and experience necessary for law enforcement and legal-related criminal justice careers. The law-legal programs are involved in law activities with professional organizations outside of the school. By the twelfth grade, students can participate in a variety of work assignments related to their career choices. More than 95% of the students at LECJ graduate as Texas Scholars.

Jack Yates School of Communications

Since 1978, the Jack Yates School of Communications has established a standard for excellence in the field of media communications. Located, on the campus of Jack Yates High School, the innovative "school-within-a-school", focuses on three specialized areas: Media Technology, Photography and Journalism. The school remains committed to providing students with the very best in instruction, resources, technology, and equipment. Jack Yates is the only HISD high school to house separate television and photography studios. The journalism department provides interns for the Houston Chronicle and the "Eye On Third Ward" initiative with the Museum of Fine Arts. The Yates School has also formed a strong alliance with Texas Southern University and the University of Houston to further teach youth through photography/media and to use the depth of information for positive change as producers and consumers. Yates' communication students participated in the 2008 Houston International Festival honoring Africa. Students created a large mural that served as a backdrop for the center performance stage at City Hall.

Pre-Engineering Programs - Project Lead the Way (PLTW)

For students interested in engineering, biomechanics, aeronautics, and other applied math and science arenas, PLTW is a special series of courses developed for the middle school and high school years. These courses complement math and science college preparatory programs to establish a solid background in engineering and technology. This program is sponsored by the East End Chamber of Commerce, which represents several petroleum, and Houston port-related industries.

The PLTW courses are available at six campuses: César Chávez, Ebbert Furr, Westbury, Phillis Wheatley, Sam Houston, and James Madison high schools. During the spring of 2008, the PLTW program at Chávez was accepted into the National Engineering Academy Network, making the HISD school one of only 21 in the country designated as a "National Engineering Academy." (Full story can be found at www.houstonisd.org, dated April 23, 2008.)

Reagan Computer Technology Magnet Program

The Reagan High School Program for Computer Technology offers students instruction through the Academy of Finance. The Academy of Finance is a four-year program that prepares students for the banking and finance industry, advanced preparation in a junior college program, or enrollment in a full baccalaureate program. It is a comprehensive program of study designed to assist students in developing knowledge of the increasing role of technology in the world of finance. The Computer Electronics and Networking Technology program is a four-year program leading to proficiency as an A+ certified computer technician or a CISCO certified networking technician. Four years of math and science are presented as well as basic electronics, solid-state devices and circuits, microprocessor theory and interfacing, and computer maintenance and repair techniques. The Cisco Systems Networking Academy teaches the principles and practice of building and maintaining networks and prepares students for the certified CISCO Networking Associated exam. Computer Programming is an intensive four-year college preparatory program with emphasis on math through calculus, science through physics, and computer science. Programming techniques are taught in a number of different programming languages including C++, JAVA Script and HTML. The students gain experiences on the latest microcomputer equipment with access to networks and the internet.

Westbury High School Health Science Program

The Health Science Career Cluster encompasses more than 200 career specialties and/or occupations. The Health Science program at Westbury High School focuses on careers in planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development. The students at Westbury perform their clinical rotation duties at the Memorial-Hermann Hospital and the People's Clinic.

What were the trends in Texas Assessment of Knowledge and Skills (TAKS) performance of students enrolled in the CTE program over the past three years, 2005–2008?

The English TAKS performance of all students enrolled in CTE courses from spring 2006 to spring 2008 is presented in **Figure 1** by subtest. As shown in Figure 1, there has been a steady increase in the passing rates of all students enrolled in CTE courses on the mathematics, reading/ELA, science, and social studies subtests. Over the three-year period, the passing rates of CTE students on the math section of the TAKS increased by 6.4 percentage points, with 55.4% of the students passing in spring 2006 compared to 61.8% of the students passing in spring 2008. In the spring 2006, the passing rates of students enrolled in CTE courses on the reading/ELA section of the TAKS was 79.4%. There was a 2.9 percentage point difference in the performance of students enrolled in CTE courses on the reading/ELA TAKS from spring 2006 to spring 2008. For the three-year period, students enrolled in CTE courses also increased their performance on the science and social studies tests by 12.7 and 6.6 percentage points, respectively.

The 2008 English TAKS performance of all students enrolled in CTE courses compared to districtwide students can be found in **Figure 2** (see page 16). According to Figure 2, the performance of all students enrolled in CTE courses in spring 2008 was slightly above the performance of students districtwide on the reading/ELA subtest by one percentage point (82% vs. 81%) as well as the social studies subtest (90% vs. 89%). At the same time, there was a gap in the performance of students enrolled in CTE courses and districtwide students in favor of the district on the mathematics and science subtests of TAKS. The districtwide performance exceeded the performance of all students enrolled in CTE courses by eight percentage points on the mathematics subtest and by four percentage points on the science subtest of TAKS.

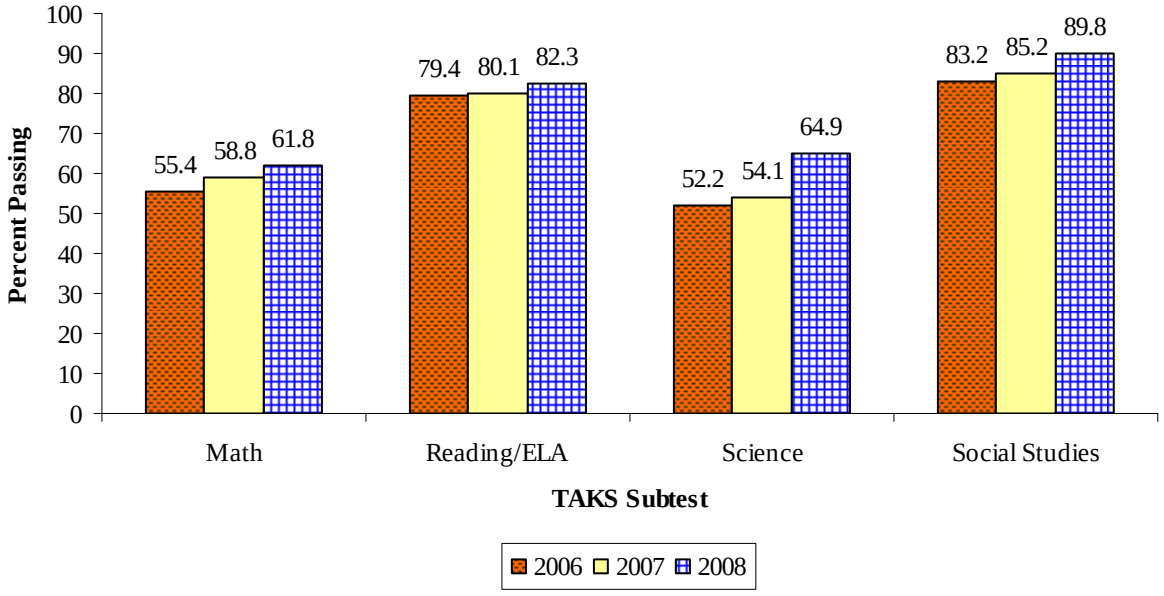

Figure 1. English TAKS performance for CTE enrolled students, spring 2006–2008.

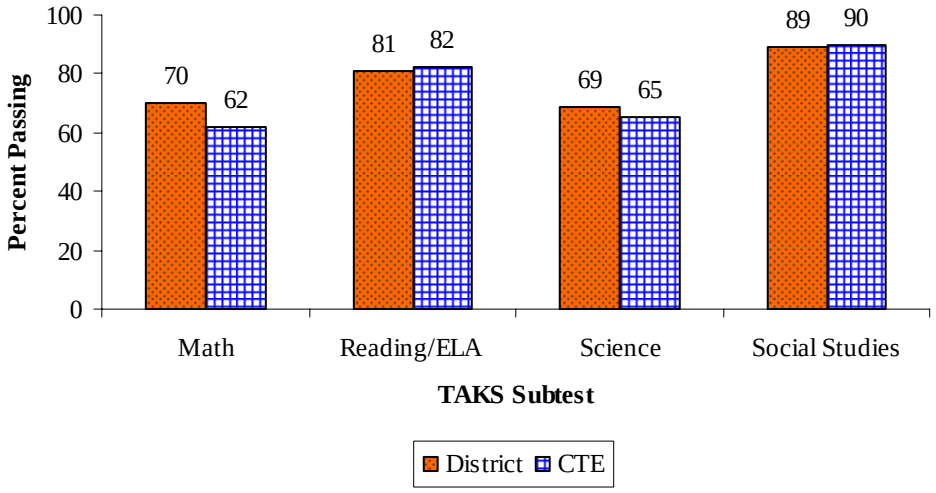

Figure 2. English TAKS performance for CTE enrolled students compared to districtwide students, spring 2008.

TEA has the Performance-Based Monitoring Analysis System (PBMAS) to examine the TAKS performance of students within special programs, including CTE. For the 2008 school year, TEA set the acceptable performance levels for program students at 50% for mathematics, 70% for reading/ELA, 45% for science, and 65% for social studies. The PBMAS has a built-in improvement component such that school programs that have not met acceptable performance levels are given three years to make improvements. Each year, required improvement standards are calculated using the current year's performance rates and the previous year's performance rates. (Details about required improvement calculations can be found at http://ritter.tea.state.tx.us/pbm/2008PBMASManualFinal.pdf.)

For the PBMAS, TEA recognized CTE students as those who were in ninth through eleventh grade and coded as CTE 2 (coherent sequence) or CTE 3 (Tech Prep). The TAKS passing rates of CTE 2 and CTE 3 students combined by category are presented in **Table 3** (see page 17). For spring 2008, the TAKS passing rates of CTE students who were classified as economically-disadvantaged and those enrolled in Tech Prep surpassed TEA acceptable performance levels on all subtests.

From spring 2007 to spring 2008, CTE LEP students made the required improvement standard in passing rates on all TAKS subtests and were rated as having acceptable performance. For the same time period, CTE students receiving special education services also met required improvements standard and were rated acceptable on the science and social studies subtests of TAKS.

What were the graduation rates of twelfth-grade students enrolled in the CTE program over the past three years, 2005–2008?

The graduation rates for twelfth-grade students enrolled in CTE from the 2005–2006 to the 2007–2008 school years are presented in **Figure 3** (see page 18). The data have been disaggregated by CTE codes 1, 2, or 3 as well as by total results. It is reflected in Figure 3 that the total number of CTE graduates increased over the three-year period, from 5,257 graduates in the spring 2006 to 5,387 graduates in the spring of 2008. There has also been a 31.3% increase in the number of CTE 2 graduates

Table 3. CTE TAKS Passing Rates by Economically-Disadvantaged, LEP, Special Education, and Tech Prep Program Participation, Spring 2006–Spring 2008

	Academic Year					
	2006		2007		2008	
	N Tested	% Passing	N Tested	% Passing	N Tested	% Passing
Economically-Disadvantaged						
Mathematics	6,570	52.5	6,442	62.6	5,849	69.9+
Reading/ELA	6,735	77.0	6,548	80.4	5,951	87.9+
Science	4,681	48.3	4,610	55.6	4,065	70.6+
Social Studies	4,624	81.5	4,588	85.6	4,060	91.9+
Limited English Proficiency						
Mathematics	599	22.4	408	27.9	354	34.7*
Reading/ELA	617	18.3	422	20.9	379	38.3*
Science	381	16.5	279	20.4	247	30.0*
Social Studies	376	47.3	276	47.1	246	64.6*
Special Education						
Mathematics	291	26.1	326	31.0	312	30.1
Reading/ELA	352	52.0	362	58.8	337	56.1
Science	208	27.9	233	27.9	282	33.0*
Social Studies	216	67.6	231	64.5	280	63.6*
Tech Prep Program						
Mathematics	70	68.6	33	75.8	120	80.0+
Reading/ELA	71	77.5	32	75.0	118	87.3+
Science	69	59.4	33	60.6	85	83.5+
Social Studies	70	85.7	33	84.8	85	96.5+

Source: Performance-Based Monitoring Analysis System, Texas Education Agency.

Note: Data is reported for students coded CTE 2 or CTE 3 only.

+: Surpassed PBMAS acceptable performance standard.

*: Met PBMAS required improvement standard.

from spring 2006 to spring 2008. The number of CTE 3 graduates fluctuated from 27 in spring 2006, to 41 in spring 2007, and 31 in spring 2008.

The percentages of CTE course–enrolled graduates among all HISD graduates are presented in **Figure 4** (see page 18). The figure reveals that the percentage of CTE 2 graduates, those who have taken a coherent sequence of career concentration courses, increased yearly. In spring 2006, 32.6% of HISD graduates were CTE 2 students. In spring 2007, 39% of HISD graduates were CTE 2 students. This percentage increased by 3.1 percentage points in spring 2008 to 42.1%.

In **Table 4** (see page 19), graduation rates are displayed by CTE codes and diploma types. 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. Students receiving special education services who complete their Individualized Education

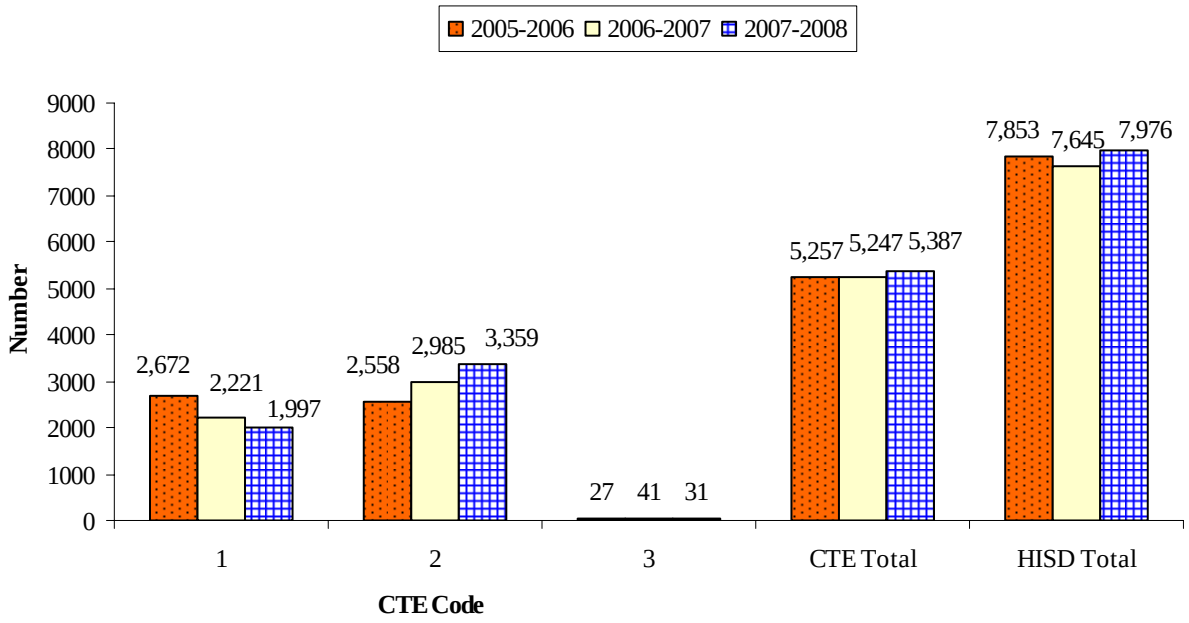

Figure 3. Number of graduates by CTE code, CTE total, and HISD totals 2005–2006 through 2007–2008.

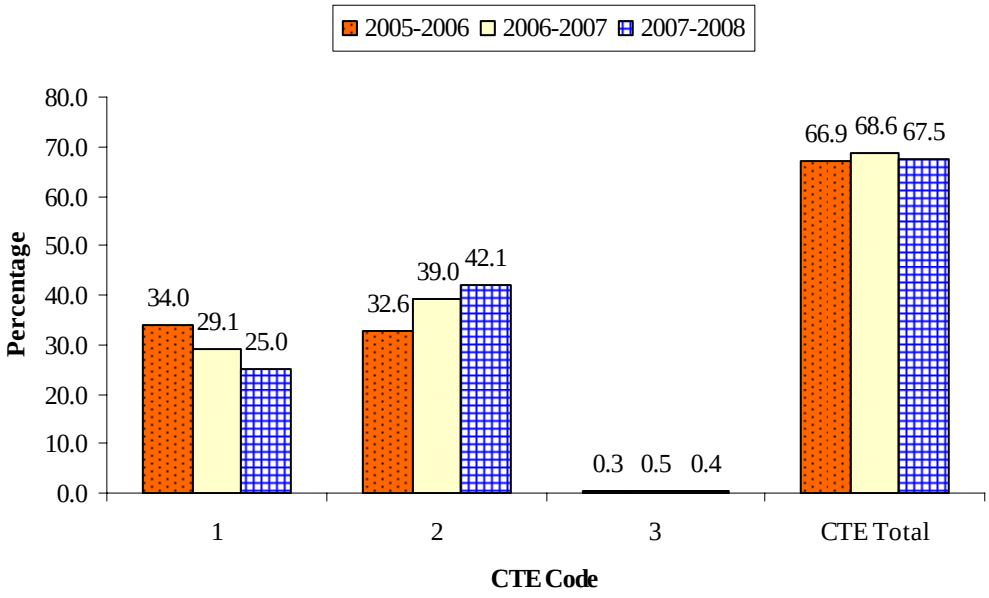

Figure 4. Percentage of CTE program graduates among all HISD graduates, 2005–2006 through 2007–2008.

Note: HISD Graduate Totals: 2005–2006 = 7,853; 2006–2007 = 7,645; 2007–2008 = 7,976

Table 4. CTE Graduation Rates by Diploma Type, 2006–2008

CTE Code	Type of Diploma	2006		2007		2008	
		N	%	N	%	N	%
1	Completion of Individualized Education Plan	164	6.1	59	7.2	169	8.4
	Regular/Minimum	320	12.0	285	12.8	181	9.1
	Recommended	2,122	79.4	1,741	78.4	1,601	80.2
	Distinguished Achievement	66	2.5	36	1.6	46	2.3
	Total	2,672	100.0	2,221	100.0	1,997	100.0
2	Completion of Individualized Education Plan	135	5.3	162	5.4	119	3.5
	Regular/Minimum	164	6.4	210	7.0	262	7.8
	Recommended	2,237	87.4	2,561	85.9	2,783	82.9
	Distinguished Achievement	22	.9	52	1.7	195	5.8
	Total	2,558	100.0	2,985	100.0	3,359	100.0
3	Completion of Individualized Education Plan	1	3.7	3	7.4	0	0.0
	Regular/Minimum	5	18.5	1	2.4	1	3.2
	Recommended	21	77.8	36	87.8	26	83.8
	Distinguished Achievement	0	0.0	1	2.4	4	13.0
	Total	27	100.0	41	100.0	31	100.0

Plan at the end of their four years in high school also receive a diploma. From spring 2006 to spring 2008, the largest percentages of CTE graduates each year earn the Recommended diploma distinction, with an average of 83%. As displayed in Table 4, the number of CTE 2 students with the highest diploma type, Distinguished Achievement, rose from 22 in spring 2006 to 195 in spring 2008.

Discussion

The HISD CTE Department offers career concentration courses and programs in which students are equipped with the academic and technical skills necessary to enter the workforce and/or continue their education at the post-secondary level after graduation. This report finds that the CTE curriculum has expanded such that courses are being provided throughout the district that relate to fifteen of the sixteen career concentrations outlined by TEA. Some course titles include Introduction to Construction Careers, Floral Design, Health Science Technology, and Interior Landscape Development. These course choices permit HISD students to have multiple opportunities to participate in a range of CTE learning experiences. Participation in career and technical student organizations fosters the development of leadership and other needed skills to succeed in post-secondary training and in the workforce. Exposure to a variety of CTE programs and courses allows students to explore their career options and gain mastery of career subject matter. The CTE Expo served as a showcase for students to display their knowledge and skills acquired within their CTE courses.

The number of CTE 2 (coherent sequence) and CTE 3 (Tech Prep) students has grown over the past three years, 2005–2008. More students are selecting career concentrations and completing multiple CTE courses in their career area of choice. The number of twelfth-grade graduates participating in CTE has also increased with 42.5% of HISD graduates coded in the program as CTE 2 or CTE 3 students in the spring of 2008.

By adopting the state of Texas plan, the CTE program in the district must continue to commit to academic excellence as defined by law. The expectations of all stakeholders, including school administrators, departmental staff, and school guidance counselors must continue to focus on establishing a seamless system that offers career counseling, business partnerships, as well as rigorous academic and technical curricula for all students. Ongoing evaluation and monitoring of program implementation and student performance will help to ensure program effectiveness and compliance.

Recommendations

1. Continue to provide program offerings and components across the career concentrations so that CTE program students can select interests from a variety of career pathways and participate in multiple career development experiences. The amount of diverse programming available for students encourages career exploration and helps students to develop an awareness of their future career options. Given the success of the CTE EXPO, program personnel should continue to expand this program component. In addition to providing a platform for CTE students to display their work from their career-related courses, the EXPO serves as an advertisement of the program offerings within the CTE program. To greater promote the CTE program, parents and students from all elementary and middle schools should be invited to the CTE EXPO to expose younger students to CTE courses earlier in their academic endeavors. CTE administrators should consider holding the EXPO on at least one school day so that district teachers could bring students for an out-of-classroom learning experience.

2. Considering the increase in the number of CTE 2 and CTE 3 graduates and the mission to equip students for training beyond high school, a database system should be developed in order to track the progress of CTE program graduates once they leave the district. One method to consider is a former student website so that CTE graduates could report completion of college, technical programs, and/or share career achievements. Since the CTE program seeks to help students prepare for post-secondary education and the world of work, maintaining a connection to former students could highlight the long-term benefits of CTE program participation in HISD.

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APPENDIX
Career Concentrations and Related Courses*, 2007-2008

Career Concentration	Sample of Related Courses
Agriculture, Food & Natural Resources	Animal Science Applied Agricultural Science And Technology Floral Design And Interior Landscape Development
Architecture & Construction	Introduction to Construction Careers Piping Trades/Plumbing I Mill and Cabinetmaking I
Audio/Visual Technology and Communications	Advertising Design I Media Technology I Textile and Apparel Design
Business, Management and Administration	Administrative Procedures I Business Communications; Business Law
Education and Training	Child Development Child Care and Guidance, Management, and Services I
Finance	Accounting I Banking and Financial Systems
Health Science;	Health Science Technology Medical Terminology; Pharmacology
Hospitality and Tourism	Culinary Arts I Hospitality Services I Hotel Management
Human Services	Consumer and Family Economics Introduction to Cosmetology Personal and Family Development
Information Technology	Business Computer Information Systems I Introduction to Computer Maintenance Keyboarding
Public Safety, Corrections and Security	Courts and Criminal Procedure Criminal Investigation Emergency Communications
Manufacturing	Metal Trades I Technology Systems Welding I
Marketing, Sales and Service	Advertising Entrepreneurship Marketing Dynamics Professional Selling
Science, Technology, Engineering and Mathematics	Technical Introduction to Computer-Aided Drafting Introduction to Electrical/Electronics Careers Introduction To Engineering Design
Transportation, Distribution and Logistics	Automotive Technician I Introduction To Transportation Service Careers

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