CAREER AND TECHNICAL EDUCATION EVALUATION,

2008–2009

Austin Independent School District
Department of Program Evaluation

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ABOUT THE DEPARTMENT OF PROGRAM EVALUATION

The Department of Program Evaluation (DPE) was established in 1972 to support program decision making and strategic planning in Austin Independent School District (AISD). The department is housed in the Office of Accountability and is charged with evaluating federal, state, and locally funded programs in AISD. DPE staff pride themselves on integrating best and innovative evaluation practices with educational and institutional knowledge. DPE works with program staff throughout the district to design and conduct formative and summative program evaluations. DPE's methods for evaluating programs vary depending on the research question, program design, and reporting requirements. The evaluations report objectively about program implementation and outcomes, and serve to inform program staff, decision makers, and planners in the district. DPE also responds to information needs at all levels. DPE reports may be accessed online at http://www.austinisd.org/inside/accountability/evaluation/reports.phtml.

ABOUT THE AUTHOR

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EXECUTIVE SUMMARY

The mission of Austin Independent School District's (AISD) Career and Technical Education (CTE) department is to provide opportunities for students to acquire 21st century academic and technical skills needed for entry into the global workforce and/or postsecondary education in order to become contributing members of their community. The purpose of this evaluation conducted by AISD's Department of Program Evaluation (DPE) was to provide information about student demographics and outcomes at the high school level to facilitate decisions about program implementation and improvement. The report focuses on answering four questions:

- What were the demographic characteristics of students in the CTE program, and how did they compare with characteristics of the general student population?
- How did the academic achievement of CTE students (as measured by the Texas Assessment of Knowledge and Skills, or TAKS) compare with that of non-CTE students?
- Did taking a series of CTE courses play a role in determining whether students pursued postsecondary education upon graduation?
- Did taking a series of CTE courses play a role in determining whether students were working right after graduation?

The demographic analysis found that just over half of high school students in AISD (55%) took a CTE course in 2008–2009, although the percentage varied widely by school. About 15% of students took a sequence of courses that taught them skills for a specific career; these students were considered CTE *course sequence takers*. On average, larger schools and those with a higher percentage of economically disadvantaged students had a higher percentage of CTE students and CTE course sequence takers than other schools.

Similar to CTE students nationally, CTE students in AISD were different from the district's general student population. A significantly higher percentage of CTE students (students who took at least one CTE course) and CTE course sequence takers than general district students were male, Hispanic, and economically disadvantaged. Female, Asian, white, and special education students were underrepresented among those who took CTE courses. Female, white, African American, special education, and English language learning (ELL) students were underrepresented among CTE course sequence takers, compared with non-sequence takers and the district as a whole.

The number and type of CTE courses available at each campus played a role in determining the demographic characteristics of CTE students. Increasing the number and diversity of courses available at each campus, and ensuring that programs attractive to both male and female students are offered, would likely diminish the demographic differences

between CTE and non-CTE students. Demographic differences also could be the result of students seeing CTE as a program for the non-college-bound because the characteristics of CTE students mirrored those of students who did not attend college.

CTE course sequence takers had higher TAKS scores and passing rates on all TAKS tests, on average, than other students. When students who took random CTE courses were included in the analysis, the TAKS passing rate for most tests remained significantly higher for CTE students; however, their average TAKS scale scores were lower than the TAKS scores of non-CTE course takers. These results demonstrated that CTE was successful, especially with course sequence takers, in attracting high achievers and was not, as historically has been the case nationally, a "dumping ground" for low achievers.

CTE participation did not appear to play a role in determining whether students pursued postsecondary education or work after graduation. Although CTE might have been successful at preparing students for postsecondary education, other factors, such as economic disadvantage, may have been stronger determinants of postsecondary enrollment. It is not clear why CTE course sequence taker status did not play a role in whether students were working after graduation. More research is needed to determine whether the skills taught in CTE classes helped students obtain employment.

In the interest of providing equal opportunity to students to pursue the career of their choice, expanding CTE opportunities, and better understanding the program's impact on students, the following actions are recommended.

For the CTE administration:

- Develop and disseminate materials that describe CTE programs and opportunities, location of programs and the benefits to students seeking to attend college or join the workforce upon graduation. Use the materials to promote CTE with the goal of expanding general offerings and course sequence opportunities on campuses.
- Develop and implement strategies to encourage female students to take courses in CTE programs that are not traditionally attractive to females (e.g., engineering).
- Continue to ensure all CTE programs on all campuses are accessible to students in special education, and teachers are aware of and are able to implement modifications to accommodate students in special education.

For other departments with college and career readiness goals:

Any department that shares college or career information with students should collaborate or increase its collaboration with CTE so those efforts are coordinated and strengthened for the benefit of students. For example:

- Guidance and Counseling staff play an important role in recruiting CTE students. School guidance counselors should make students aware of opportunities to gain

college credit or certifications through CTE courses. They should work with CTE staff to encourage female students to take nontraditional courses. They could train CTE teachers in the college and career software students use (i.e., Naviance), so CTE teachers could be aware of the colleges and programs that excel in particular career areas and be another voice in guiding students to those opportunities.

- The Offices of Middle and High Schools could use the expertise of CTE staff to better inform school principals about CTE programs and benefits for students.
- The Offices of Middle Schools and School Redesign, both responsible for the implementation of student advisory, could work with CTE staff to develop and provide curriculum about college and careers in their respective advisory programs.

For DPE:

- Conduct research to determine whether students who intend to go to college are taking CTE courses and whether additional obstacles to female participation exist in CTE.
- Conduct a program-by-program analysis to explore whether different ethnicities of students are concentrated in particular career areas.
- Obtain enrollment data from career colleges and schools not included in the NSC dataset.
- Obtain and analyze Texas Workforce Commission (TWC) data for the fourth quarter of 2008 and identify the work outcomes of certificate and license earners.

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INTRODUCTION

HISTORICAL CONTEXT

In the early 1990s, the federal government instituted reforms for work-related education to increase academic performance and workforce skills. Two 1988 reports by the William T. Grant Foundation, commonly referred to as The Forgotten Half, called attention to the quality of life for the nation's 20 million 16- to 24-year-olds who did not attend college. The reports found that a significant portion of the non-college-bound were working at low-paying, dead-end jobs and were living in poverty (Mithaug, 1994; William T. Grant Foundation, 2009). An earlier education report, *A Nation at Risk*, found 75% of high school students in the U.S. lacked the basic skills to meet the demands of the workplace or college (Mithaug, 1994). This reality and industry's concerns that the quality of education in the U.S. was not adequate to promote the country's ability to successfully compete globally led elected officials to reform what was then called vocational education (Stone & Aliaga, 2005).

One element of the reform was the Carl D. Perkins Vocational Education Act, passed in 1984 and reauthorized in 1990. The act and the changes instituted as part of the reauthorization were intended to move career education away from job-specific training and toward an integration of a career and academic education. The act was refined in later years to improve those efforts.

Another element of reform was the Secretary's Commission on Achieving Necessary Skills (SCANS). The Secretary of Labor appointed the commission to determine the skills young people needed to be successful in the workplace. SCANS' report, *What Work Requires of Schools*, outlined three-part foundation skills and five competencies all students should have to succeed (National Consortium for Product Quality in Vocational Education, 1994). Those skills and competencies were integrated into Career and Technical Education (CTE) courses in the Austin Independent School District (AISD).

These changes at the federal level resulted in changes to career education around the country. Career education no longer meant wood shop or automotive technology for the boys and home economics for the girls. The available career programs expanded and changed to better meet the economic needs of the country. For instance, career programs available in AISD now include health science technology and pre-engineering. CTE is no longer a route only for students who are not college bound. Instead, CTE programs provide opportunities to join the workforce or to prepare for a career through college.

LOCAL CONTEXT

Austin Community College (ACC) manages the operation and administration of CTE for AISD under the umbrella of College and Career Preparatory Programs (CCPP). In the

2008–2009 school year, CTE operated on a budget of $2,561,237. Both federal and local sources funded the program. The federal Perkins grant provided almost 50% of the funds ($1,235,365). A little more than 27% ($693,902) was provided by AISD through its contract with ACC. Grants, bonds, and other AISD funds accounted for the remaining funding.

The district's goal for all CCPP areas calls for students to:

- Explore and experience a wide range of career options in relation to their interests and aptitudes
- Graduate with a jumpstart on college and career, including consideration of:
  - Postsecondary credit
  - Industry certification
  - Scholarship opportunities
- Demonstrate and understand the skills and knowledge to:
  - Successfully enroll in postsecondary education
  - Access financial aid
  - Transition into the work force
  - Be successful in a variety of jobs and careers

The mission of CTE is to provide opportunities for students to acquire 21st century academic and technical skills needed for entry into the global workforce and/or postsecondary education in order to become contributing members of their community. CTE programs and courses are offered as electives at both the middle and high school levels. District and campus leaders work with CTE staff to determine which programs and courses are offered across the district. Not all programs are offered at every school. Three CTE programs were offered at middle schools in the 2008–2009 school year: Skills for Living, Technology Education, and Business Education. Appendix A lists the middle schools at which these programs were offered. AISD high schools offered the following CTE programs:

- Agricultural Science and Technology Education
- Business and Marketing Education
- Health Science Technology Education
- Family and Consumer Sciences Education
- Technology Education
- Trade and Industrial Education

Appendix B lists the career pathways associated with these programs (e.g., cosmetology and criminal justice in the Trade and Industrial Education program). Appendix C provides a list of the programs and career pathways by high school. Each program offers opportunities to earn college credit at the same time as high school credit. In 2008–2009, agreements with ACC that

linked high school courses to college courses for college credit covered 13 college departments and 46 courses and resulted in 752 students getting college credit from ACC. Opportunities also are available to earn industry-recognized licenses and certifications and to participate in internships with local employers. In 2008–2009, 537 students earned licenses or certifications through the CTE program. Appendices D and E list the certification and internship opportunities, respectively, available to AISD high school students in the 2008–2009 school year. The CTE program also offers students opportunities to enhance their leadership skills through career-related organizations (Appendix F).

METHODS

PURPOSE

The purpose of this evaluation conducted by AISD's Department of Program Evaluation (DPE) staff was to provide information about student demographics and outcomes at the high school level to facilitate decisions about program implementation and improvement.

EVALUATION QUESTIONS

The evaluation focused on four major questions:

- What were the demographic characteristics of students in the CTE program, and how did they compare with characteristics of the general student population?
- How did the academic achievement of CTE students (as measured by the Texas Assessment of Knowledge and Skills or TAKS) compare with that of non-CTE students?
- Did taking a series of CTE courses play a role in determining whether students pursued postsecondary education upon graduation?
- Did taking a series of CTE courses play a role in determining whether students were working right after graduation?

DATA COLLECTION

District information systems provided student demographic, CTE participation, and TAKS data. The National Student Clearinghouse (NSC) and the Ray Marshall Center (RMC) at the University of Texas at Austin provided the postsecondary enrollment data, and the Texas Workforce Commission (TWC) provided the workforce data. The NSC collects and verifies postsecondary enrollment data for 92% of all U.S. college students enrolled in more than 3,300 colleges across the country. The RMC, a public policy research institute, provided data for students enrolled at the University of Texas at Austin, one of the few major universities Austin students attend that is not tracked by the NSC. Although NSC data include community colleges, some technical institutes, and schools of law and medicine, few career colleges and

schools in Texas are included compared to their number in the state—the TWC regulates 467 licensed career colleges and schools in Texas, and the NSC tracks enrollment in only 9 of them. Although these career colleges seem a likely destination for CTE students, the number of Austin graduates who attend these colleges and whether the inclusion of their enrollment information would have a significant impact on the results described in this report are unknown.

DATA ANALYSIS

Several types of analyses were used to determine program outcomes. Descriptive statistics were used to describe CTE enrollment. The further analysis of demographic data comparing 2008–2009 CTE students with non-CTE students and the general student population was conducted using a *t*-test, a statistical analysis that identifies differences between groups that are not due to chance. This methodology also was used to examine the demographic characteristics of CTE students compared with non-CTE students by the U.S. Department of Education's National Center for Education Statistics (Levesque et al., 2008). As noted by this source, although each demographic characteristic is examined separately, collinearity may exist among them. For example, the CTE participation of English language learners (ELL) might be related to these students' economic status. For the demographic analysis, attempts were not made to isolate the independent contribution of different characteristics to CTE participation.

The analysis of the relationship between CTE participation and postsecondary enrollment and workforce participation after high school used data from the graduating class of 2008. These analyses used a logistic regression model with either postsecondary enrollment or participation in the workforce during the third quarter of 2008 as the dependent variable. The independent variable of interest was CTE course sequence taker status; however, also included in the model, to control for their influences, were race/ethnicity, gender, campus, economic disadvantage status, special education status, ELL status, and TAKS math exit test score. The math TAKS was included as an indicator of academic achievement.

Defining CTE Status

Studies and reports about CTE programs around the country define CTE students in different ways. Some analyze transcripts and measure credits earned in CTE courses to define CTE concentrators. Others use student self-identification as a CTE concentrator. How a CTE concentrator is defined affects the outcomes examined (Stone & Aliaga, 2005).

The Texas Education Agency categorizes CTE students into one of three categories, based on their involvement in CTE and their stated intention to take further courses. Category 1 includes students enrolled in a CTE course; however, these students' plan of study does not

include a coherent sequence of CTE courses. In other words, these students could have taken a CTE course because it sparked their interest or it fulfilled a requirement, but they did not have a stated plan to follow a sequence of courses in a CTE program. Category 2 includes students who are enrolled in a sequential course of study in CTE and whose 4-year plan of study includes taking a sequence of CTE courses. The sequential course of study provides students with a strong foundation in a chosen field. Category 3 includes students participating in Tech Prep. Tech Prep offers students who follow a state-approved plan of study in identified career areas the opportunity to earn college credit for some CTE courses they take in high school. For AISD, CTE concentrators, called *course sequence takers*, are students in Categories 2 and 3, and they are the unit of comparison when examining student outcomes.

EVALUATION RESULTS

DEMOGRAPHIC RESULTS

Ideally, many AISD high school students would take CTE courses, and the percentages of CTE students at each campus would be similar. As noted, not all CTE programs were offered at every school. However, a similar percentage of CTE students at each campus would indicate that the CTE course offerings were sufficient and appropriate for the students. A similarity in the demographics of CTE and non-CTE students would indicate that students with different characteristics had the same opportunity to participate in CTE and that the courses were attractive to a variety of students.

CTE Participation Summary, by School

In 2008–2009, over half of the high school students in the district took a CTE course (55%), and most of these students were in the first category of CTE students (Table 1). The percentage of students who took CTE courses at each campus varied from 28% at Anderson and the Liberal Arts and Science Academy of Austin (LASA) to 73% at Akins. At most schools, the majority of CTE students were not taking a sequence of courses; however, at Garza, a higher percentage of students were taking a sequence of courses than were taking non-sequential CTE courses.

Comparing the six largest schools to the seven smallest in student population revealed that schools with larger student populations usually had a significantly higher percentage of CTE students; Anderson was a notable exception (Table 1). The percentage of students taking a sequence of courses also varied among the campuses, ranging respectively from 1% and 2% at LBJ and Anderson to 34% and 35% at Akins and Garza. The variation in the percentages of course sequence takers followed the same pattern as all CTE students as a group. Generally, the larger the school, the higher the percentage of CTE course sequence takers.

Table 1. CTE Students, by High School, 2008–2009

School*	Number enrolled	Non-CTE	Total CTE	CTE Category 1	2	3
Akins	2,366	27%	73%	39%	27%	7%
Anderson	1,936	72%	28%	26%	2%	0%
Austin	2,164	51%	49%	39%	8%	2%
Bowie	2,624	37%	63%	48%	12%	4%
Crockett	1,592	42%	58%	34%	15%	9%
Eastside Memorial	449	51%	49%	41%	2%	5%
Garza	118	36%	64%	30%	35%	0%
Lanier	1,314	32%	68%	49%	16%	3%
LASA	825	72%	28%	15%	9%	4%
LBJ	912	51%	49%	48%	0.4%	0.3%
McCallum	1,567	46%	54%	47%	5%	3%
Reagan	766	59%	41%	36%	1%	4%
Travis	1,215	32%	68%	50%	7%	11%
Total District	**17,848**	**45%**	**55%**	**40%**	**11%**	**4%**

Source. AISD student enrollment files prepared by DPE
* The six largest schools are italicized.

To further explain the differences in CTE participation among schools, the percentage of economically disadvantaged students enrolled in each school was considered. Table 2 presents the percentage of CTE students at each campus, with the schools listed in ascending order of the percentage of economically disadvantaged students. A comparison of the six schools with lower percentages of economically disadvantaged students with the seven schools that had higher percentages of economically disadvantaged students revealed a statistically significant difference between the groups. Generally, schools with a higher percentage of economically disadvantaged students also had a higher percentage of CTE students. This trend was evident regardless of school size. For example, although Anderson and Akins were both large schools, Anderson had a much lower percentage of CTE students compared with Akins. A difference between the two schools was the percentage of economically disadvantaged students, with 22% at Andersons and 68% at Akins.

Another difference between these large schools was the number of CTE programs and career pathways offered. Anderson offered 3 CTE programs with 6 career pathways. Akins offered 6 CTE programs with 14 career pathways. Students at Akins had more options, and almost three-quarters of the students took the CTE courses.

Table 2. CTE Students (All Categories), by Campus and Economically Disadvantaged Student Population, 2008–2009

School	Percentage economically disadvantaged	Total CTE	Non-CTE	Number enrolled
Bowie	14%	63%	37%	2,624
Anderson	22%	28%	72%	1,936
LASA	23%	28%	72%	825
Austin	38%	49%	51%	2,164
McCallum	41%	54%	46%	1,567
Garza	42%	64%	36%	118
Crockett	64%	58%	42%	1,592
Akins	68%	73%	27%	2,366
LBJ	83%	49%	51%	912
Travis	90%	68%	32%	1,215
Reagan	91%	41%	59%	766
Lanier	92%	68%	32%	1,314
Eastside Memorial	96%	49%	51%	449
Total district	**52%**	**55%**	**45%**	**17,848**

Source. AISD student enrollment files prepared by DPE

The number and type of CTE programs at a school were the result of campus-level decisions, wherein school size and the percentage of economically disadvantaged students may have played an indirect part in the decision-making process. Campus administrators might have based their decisions about whether to introduce a CTE program on their campus on labor market information, opportunities offered for college credit, the availability of classroom space, the ability of current staff to teach a CTE course and/or the ability to hire additional staff, the perceived student interest in a CTE program, and the available funding for construction or equipment. Thus, the campus administrators' level of knowledge about CTE, their perception of student and community needs and desires, and their knowledge about available funding to support CTE programs all played a role in the size and composition of CTE programs at a school and in the level of student participation in CTE. Factors relevant to the particular programs at a campus also might have made those programs more or less desirable to students. It is beyond the scope of this report to explore what those factors might have been at a campus level.

CTE enrollment varied by campus based on factors including school size, percentage of economically disadvantaged students, and CTE program availability.

Gender and Race/Ethnicity of CTE Students

The gender and race/ethnicity of CTE students (all categories) were compared with non-CTE students and for all students in the district in the 2008–2009 school year (Table 3). The percentages of male and Hispanic students who took CTE courses were significantly higher than the corresponding percentages in the district, and the percentages of female, Asian, and White students who took CTE courses were significantly lower than the corresponding percentages in the district. A comparison of CTE course sequence takers with non-sequence takers yielded similar results. The only difference was that the CTE course sequence taker group did not have a significantly lower percentage of Asian students, but rather had a lower percentage of African American students.

Table 3. Gender and Race/Ethnicity of CTE, Non-CTE, and AISD High School Students, 2008–2009

	Total	Male*	Female*	Native American	Asian*	African American	Hispanic*	White*
CTE	55%	53%	47%	0%	3%	13%	53%	31%
Non-CTE	45%	49%	51%	0%	4%	14%	45%	37%
District Total	**100%**	**51%**	**49%**	**0%**	**3%**	**13%**	**50%**	**34%**

Source. AISD student enrollment and demographic files prepared by DPE
* The difference between CTE and non-CTE students ($p < .01$) and CTE and total students ($p < .05$) are statistically significant.

As demonstrated in Table 4, more than 55% of the CTE students were male in 10 of the 13 high schools (the highest percentage of males in a school was 53%). Because males were overrepresented in CTE at almost every high school, this issue appears to have been district wide, as opposed to isolated in a few large high schools.

One characteristic that distinguished Hispanic students from their Asian and White counterparts was the percentage of students who were economically disadvantaged. In 2008–2009, 74% of the Hispanic high school students at AISD were economically disadvantaged, compared with 30% of Asians and 12% of Whites. In contrast, a higher percentage of African American students were economically disadvantaged (75%), compared with Hispanic students, although African American students were not overrepresented in the CTE population. Thus, the reasons for the differences in CTE participation among different ethnic groups are not clear cut.

Other Demographic Characteristics

The differences between CTE (all categories) and non-CTE students in regard to other demographic characteristics also were examined (Table 5). The percentage of special education

students who took CTE courses was significantly lower than the corresponding percentage in the district, and the percentage of economically disadvantaged students taking CTE courses was significantly higher than the corresponding percentage in the district. A comparison of CTE course sequence takers with non-sequence takers yielded similar results, except that the CTE course sequence taker group also had a significantly lower percentage of ELL students.

Table 4. CTE Status and Gender, by Campus, 2008–2009

	Male			Female		
School	**CTE**	**Non-CTE**	**Total**	**CTE**	**Non-CTE**	**Total**
Austin	45%	53%	52%	55%	47%	48%
Lanier	40%	53%	51%	60%	47%	49%
McCallum	70%	48%	50%	30%	52%	50%
Reagan	79%	52%	53%	21%	48%	47%
Travis	59%	50%	51%	41%	50%	49%
Crockett	59%	49%	52%	41%	51%	48%
Anderson	85%	51%	51%	15%	49%	49%
Bowie	59%	49%	51%	41%	51%	49%
LBJ	57%	52%	52%	43%	48%	48%
Garza	44%	45%	45%	56%	55%	55%
Akins	53%	51%	52%	47%	49%	48%
LASA	51%	49%	49%	49%	51%	51%
Eastside	52%	50%	50%	48%	50%	50%
Total	**55%**	**50%**	**51%**	**45%**	**50%**	**49%**

Source. AISD student enrollment and demographic files prepared by DPE

Table 5. Characteristics of CTE (All Categories), Non-CTE, and AISD High School Students, 2008–2009

CTE Status	Total	Special education*	English language learner	Economic disadvantage*
CTE	55%	11%	11%	55%
Non-CTE	45%	13%	12%	48%
Total	**100%**	**12%**	**11%**	**52%**

Source. AISD student enrollment and demographic files prepared by DPE
* The difference between CTE and non-CTE students ($p < .01$) and CTE and the totals ($p < .05$) are statistically significant.

Summary of Demographic Findings

In sum, more than half of AISD students chose to take at least one CTE course. Fewer, around 15%, became course sequence takers. The percentages of students who took CTE courses varied widely by campus. On average, the larger the campus and the higher the percentage of economically disadvantaged students, the higher the percentage of CTE students and CTE course sequence takers. A significantly higher percentage of CTE students and CTE course sequence takers were male, Hispanic, and economically disadvantaged. Female, Asian, White, and special education students were underrepresented among all CTE students, and female, White, African American, special education and ELL students were underrepresented among CTE course sequence takers, compared with the non-CTE population and the district as a whole.

The demographic profile of CTE students was significantly different compared with that of non-CTE students.

CTE TAKS RESULTS

This section of the report looks at the academic achievement of CTE and non-CTE high school students in AISD in 2008–2009, as measured by TAKS passing rates and TAKS scores. TAKS test results were examined for all CTE students, including categories 1, 2, and 3, and were compared with non-CTE students. This analysis revealed that a significantly higher percentage of CTE students than of non-CTE students passed every TAKS test, except science, for which almost equal percentages of CTE and non-CTE students passed (Table 6). Although CTE students had a significantly higher passing rate than non-CTE students, their actual TAKS scale scores were significantly lower on all TAKS tests compared with the scores for non-CTE students (Table 7).

Table 6. TAKS Passing Rates for CTE and Non-CTE Students, 2008–2009

	Reading	Math	Social studies	Science
CTE	88%	71%	93%	74%
Non-CTE	85%	67%	91%	74%
Difference	**3%***	**4%***	**2%***	**0%**

Source. AISD TAKS files prepared by DPE
Note. Twelfth graders were excluded from the analysis because the exit TAKS is taken in 11th grade.
* Statistically significant ($p < .05$)

Table 7. Average Scale Scores on TAKS for CTE (All Categories) and Non-CTE Students, 2008–2009

	Reading	Math	Social studies	Science
CTE	2249.09	2213.38	2347.56	2195.96
Non-CTE	2256.39	2224.41	2374.96	2224.51
Difference	**-7.30***	**-11.03***	**-27.40***	**-28.55***

Source. AISD TAKS files prepared by DPE
Note. Twelfth graders were excluded from the analysis because the exit TAKS is taken in 11th grade.
* Statistically significant ($p < .05$)

CTE students had higher TAKS passing rates than did non-CTE students.

It is important to look at the TAKS results of students who chose to take a coherent sequence of CTE courses (categories 2 and 3) because these students decided to pursue skills in a particular career, as opposed to taking random CTE electives. A significantly higher percentage of CTE course sequence takers passed each TAKS test, including science, than did non-CTE students (Table 8). On all of the TAKS tests, CTE course sequence takers had a significantly *higher* scale score than did non-CTE students (Table 9).

Table 8. TAKS Passing Rates for CTE Course Sequence Takers and Non-sequence Takers, 2008–2009

	Reading	Math	Social studies	Science
CTE	91%	78%	97%	82%
Non-CTE	86%	68%	92%	73%
Difference	**5%***	**10%***	**5%***	**9%***

Source. AISD TAKS files prepared by DPE
* Statistically significant ($p < .05$)

Table 9. Average Scale Scores on TAKS for CTE Course Sequence Takers and Non-sequence Takers, 2008–2009

	Reading	Math	Social studies	Science
CTE	2,269.67	2,234.96	2,373.01	2,221.93
Non-CTE	2,251.03	2,217.45	2,358.58	2,207.57
Difference	**18.64***	**17.51***	**14.43***	**14.36***

Source. AISD TAKS files prepared by DPE.
* Statistically significant ($p < .05$)

In sum, students who concentrated in CTE generally had higher TAKS scores and passing rates on all TAKS tests than did other students. When students who took random CTE courses were included in the analysis, the TAKS passing rate was still significantly higher on

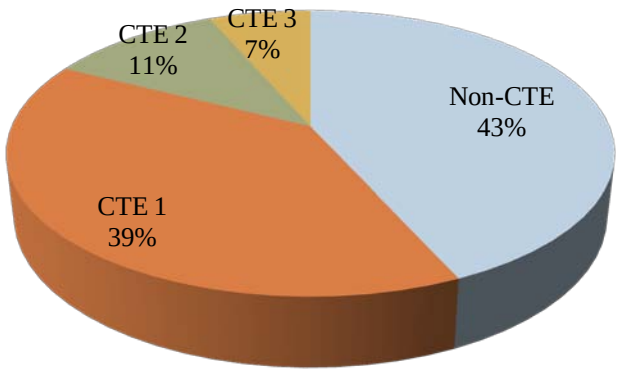
most tests for CTE students, but the TAKS scores were lower on average than were the scores of non-CTE students.

POSTSECONDARY EDUCATION RESULTS

This section of the report explores whether CTE course sequence takers who graduated in Spring 2008 enrolled in a college or trade school at a higher rate than did non-CTE sequence taker graduates for the Fall 2008 semester. CTE's mission involves preparing students to continue their education after high school in preparation for entering the workforce. For example, students who graduated from high school as a certified nursing assistant or pharmacy technician might have chosen to continue their education to become a registered nurse or pharmacist. Also, CTE courses that provided the opportunity for students to earn college credit while in high school not only prepared students for college, but decreased the costs of a college education.

In 2007–2008, AISD had 3,789 graduates. About 57% of the graduates were CTE students and 18% were CTE course sequence takers. A summary of the CTE graduates by category is provided in Figure 1.

Figure 1. AISD High School Graduates 2007–2008, by CTE Category



Source. AISD student enrollment files prepared by DPE
Note. The 114 graduates with unknown CTE status were not included in the analysis.

Before comparing the proportion of CTE course sequence takers and other students who entered a postsecondary institution after high school graduation, the demographic differences between CTE course sequence takers and other students must be considered. For instance, if it were found that CTE course sequence takers enrolled in college at a rate significantly lower than that of other students, it would be unclear whether this occurred

because the majority of CTE course sequence takers were economically disadvantaged, male, or because they were CTE course sequence takers.

One way to reduce the influence of these confounding factors is to compare groups of students with similar characteristics. A campus-level analysis partially accomplishes this because it groups together students from the same geographic community who are thus likely to share some demographic characteristics (e.g., family economic status). Table 10 compares the postsecondary enrollment of 2007–2008 high school graduates by CTE status and campus. (Enrollment data for 2008–2009 graduates were not yet available.) At 7 of the 13 schools, the postsecondary enrollment of CTE course sequence takers was higher than the enrollment of non-sequence takers.

Table 10. Postsecondary Enrollment of 2007–2008 High School Graduates, by Combined CTE Categories and School

School	Non-CTE sequence takers (0 and 1)	Percentage enrolled	CTE sequence takers (2 and 3)	Percentage enrolled
Akins	235	49%	146	**61%**
Anderson	438	74%	19	**95%**
Austin	422	**76%**	50	70%
Bowie	535	**83%**	91	80%
Crockett	259	56%	78	**65%**
Garza	108	42%	14	**42%**
Johnston	93	38%	15	**53%**
Lanier	141	**39%**	85	38%
LASA	152	**85%**	42	67%
LBJ	152	46%	11	**55%**
McCallum	321	73%	25	**76%**
Reagan	96	**43%**	20	30%
Travis	172	**40%**	67	36%
All high schools	**3,124**	**65%**	**663**	**60%**

Source. AISD student enrollment data prepared by DPE; NSC and RMC
Note. The higher percentage between the CTE and non-CTE groups is bolded in each row. The 114 graduates with unknown CTE status were not included in the analysis.

Although grouping students by campus helped make the comparisons more valid, it cannot be concluded from these results that CTE played a role in creating higher postsecondary enrollment percentages. Therefore, a more complex analysis method was used to systematically control for demographic and other characteristics (e.g., academic achievement) that could play a role in influencing whether a student chooses to further his or her education after high school, and separate those characteristics from CTE status. What is not controlled for in this model is selection bias. Students were not placed into CTE randomly; they chose to be

CTE course sequence takers. The fact that they made that choice differentiates them from students who did not choose CTE. This difference is not controlled for in the analysis model, so caution should be used in interpreting the results.

After controlling for a variety of student characteristics (e.g., campus; gender; race/ethnicity; ELL status; special education status; economic disadvantage; academic achievement, as measured by the math TAKS) and school characteristics, the analysis revealed that CTE status was not a significant determinant of postsecondary enrollment. Other factors (e.g., being female, having high academic achievement, and not being ELL or economically disadvantaged) were found to be stronger determinants of postsecondary enrollment than was CTE status (Appendix G).

CTE status was not found to be a significant determinant of postsecondary enrollment.

An analysis by campus that controlled for the same demographic and academic achievement factors revealed only one school at which CTE course sequence taker status made a significant difference in postsecondary enrollment. At LASA, a magnet school in which more than 80% of the students enroll in college, CTE course sequence takers were significantly less likely to enroll in a postsecondary institution. At every other campus, CTE status was not a significant determinant of postsecondary enrollment.

WORKFORCE RESULTS

The CTE program strives to prepare students to enter the workforce. This section of the report examines the work status of CTE course sequence takers and other graduates who did not attend an educational institution in Fall 2008.

To promote workforce readiness, some CTE programs offered business internships or clinical rotations. Other programs provided opportunities for students to obtain industry-recognized certifications or licenses in a career or software that allowed students to enter the workforce right after high school in a chosen career (e.g., as a certified veterinary assistant, pharmacy technician, or cosmetologist). Although not all CTE students took advantage of these opportunities, all CTE course sequences were supposed to provide students with a solid foundation of knowledge and skills in a career area. It would be reasonable to expect, then, that of the students who did not continue their education after high school, a higher percentage of CTE course sequence takers than of non-sequence takers would be working soon after graduation.

CTE status was not found to be a significant determinant of work status upon graduation.

Texas workforce data were examined for the third quarter of 2008 (July–September).The percentages of CTE students who were working, and according to NSC and

RMC data, were not enrolled in a postsecondary institution, were about the same regardless of their CTE category (Table 11). At 6 of the 13 campuses, a higher percentage of CTE course sequence takers than of non-sequence takers were working (Table 12).

Table 11. Working Status of 2007–2008 Graduates Not Pursuing Postsecondary Education, by CTE Category

CTE category	Total graduates	Total working and not enrolled	Percentage working
0	1,104	286	25.9%
1	924	241	26.1%
2	288	72	25.0%
3	168	43	25.6%
Total	**2,484**	**642**	**25.8%**

Source. TWC, NSC, RMC, prepared by DPE

Table 12. Work Status the Third Quarter of 2008, by Campus and CTE Status of 2008 Graduates Not Enrolled in Postsecondary Institutions

School	Number of 0s and 1s not enrolled	Percentage of 0s and 1s working	Number of 2s and 3s not enrolled	Percentage of 2s and 3s working
Akins	119	**57%**	57	46%
Anderson	113	53%	*	**100%**
Austin	103	44%	15	**47%**
Bowie	93	58%	18	**67%**
Crockett	115	50%	27	**70%**
Garza	62	**61%**	8	25%
Johnston	58	**45%**	7	29%
Lanier	86	30%	53	**34%**
LASA	23	30%	14	**36%**
LBJ	82	**48%**	*	40%
McCallum	87	**46%**	6	33%
Reagan	55	**40%**	14	14%
Travis	104	**43%**	43	40%
Total	**1,100**	**48%**	**268**	**43%**

Source. AISD student enrollment files, TWC, NSC, RMC data, prepared by DPE
Note. The higher percentage between the 0s and 1s and the 2s and 3s is bolded in each row.
* This category was excluded because counts were 5 or fewer.

Controlling for a variety of student characteristics, CTE course sequence taker status was not found to be a significant determinant of whether a student worked right after graduation. Other factors (e.g., academic achievement, ELL status, and race/ethnicity) were stronger determinants of work status upon graduation than was CTE course sequence taker

status (Appendix G). For example, the higher the TAKS math score, the less likely a student would be working. Also, ELL and Asian students were much less likely to be working than were non-ELL students and students of other races.

DISCUSSION OF RESULTS

The section below discusses the differences found between CTE and other students regarding their demographic characteristics, academic achievement, enrollment in a postsecondary educational institution, and work status.

Differences in Percentages of CTE Students, by Campus

The demographic analysis found that more than half of the students in AISD took a CTE course in 2008–2009, although the percentage varied widely by school. Understanding the difference in the percentages of CTE students at each campus is important because the ideal is that every student have an equal opportunity to pursue the career of his or her choice. If a student is enrolled in a high school that does not offer courses in the career area in which the student has an interest, he or she may transfer to another school. However, challenges are associated with doing so. The student must have the guidance and information to know what CTE offerings exist at other campuses, the desired school must be accepting transfer students, and the student must provide the necessary transportation.

Information about which programs and career pathways are available at each school has not been easily accessible to the public. Outside of course descriptions provided in the district course catalog, the literature or information published for students and their families to consider is limited. Students often have to rely on the knowledge of school guidance counselors to help them pursue their career interests, and it is unclear whether counselors are fully versed in CTE opportunities by school or know how students could take advantage of these opportunities. The large majority of students attend their neighborhood school and have access to whatever CTE offerings are available at that school.

What accounted for the wide range of percentages of CTE students across schools? On average, larger schools and those with a higher percentage of economically disadvantaged students had the highest percentage of CTE students and CTE course sequence takers.

The size of a school is linked to the number of CTE programs that can be implemented there because schools receive funding based on the number of students attending. Some CTE programs (e.g., automotive technology and health science technology) require large investments, so they cannot be offered at every school. A larger school might be better able to justify the expense of such programs because a critical mass of students would use the investment. It follows that the more programs available at a school, the more likely one would

appeal to a student and motivate him or her to take a CTE course, resulting in a higher percentage of CTE students. Appendix C listing programs and career pathways by high school appears to validate this assumption: the six schools with the largest number of career pathways and programs had the five highest percentages of CTE students. Another contributing factor to the differences in the percentage of CTE students by school could be that some schools, regardless of size, did not offer CTE courses to students until they were in the tenth grade.

The number and diversity of CTE offerings at a campus probably have an impact on the characteristics of the CTE population at that campus and the district as a whole. Because campus administrators decide what type and how many CTE courses will be available to their students, continued information sharing with campus administrators about the value and breadth of CTE programs could help them expand and diversify offerings for all students.

The percentages of students who were categorized as course sequence takers were low compared with percentages for the whole CTE group. If CTE staff intend to increase the percentage of course sequence takers and ensure that all students have an opportunity to pursue a sequence of courses, they need to investigate ways to better publicize and promote CTE programs and benefits. Making information more accessible to students, parents, and administrators could increase awareness of CTE and how it differs from the vocational education of the past.

Differences in Demographic Characteristics

Similar to CTE students nationally, CTE students in AISD had different demographic characteristics, compared with the characteristics of the general student population. A significantly higher percentage of CTE students and course sequence takers were male, Hispanic, and economically disadvantaged. For all CTE students, a significantly lower percentage were Asian, White, and in special education, and for CTE course sequence takers, a significantly lower percentage were female, White, African American, in special education and ELL. The characteristics that distinguished CTE students mirrored the characteristics of 2007 and 2008 AISD high school graduates not enrolled in college. A study of those graduates found lower percentages of male, Hispanic, and economically disadvantaged students enrolled in 2- or 4-year colleges, compared with the percentages of other graduates in their class. (Garland 2009).

Characteristics of CTE students mirrored those of students who did not attend college.

Gender Differences

A higher percentage of male than of female students in CTE was present in almost all the high schools, making it likely that the issue was district wide rather than concentrated in a few schools. These findings are not unusual. A national study analyzing public high school

student participation in CTE from 1990 to 2005 found more males than females in CTE (Levesque et al., 2008).

Several factors may account for the gender difference in CTE course taking. Nationally and in AISD, females enroll in college at higher rates than males. Students may consider CTE as an option for the non-college-bound, or students seeking to enter college may take more traditionally academic elective courses rather than CTE courses. CTE courses also may not be as attractive to females because of traditional gender roles. The three high schools in which the majority of CTE participants were female offered programs such as culinary arts, teaching, cosmetology, and health sciences. To enroll more females in CTE courses, the CTE administration could encourage more campuses to offer courses traditionally more attractive to females, and/or it could help motivate females to take courses in programs that are more traditionally male (e.g., engineering). Further investigation beyond the scope of this report is needed to determine why the significant majority of CTE students were male, and what the deterrents might be for greater female participation in CTE.

Significantly more male than female students participate in CTE in AISD and nationally.

Racial/ethnic Differences

As with gender, national differences were found in the race/ethnicity of students participating in CTE (Levesque et al., 2008). CTE students' significant racial/ethnic differences from non-CTE students were reflections of characteristics that may not have been measured. Characteristics that could influence whether a student took a CTE course include family expectations, parents' education level, student exposure to role models, parent participation in the student's academic life, immigrant status, and cultural factors. It is difficult to know what factors CTE could influence to encourage people of all races and ethnicities to take CTE courses. Only through more data collection and analysis can the factors tied to race/ethnicity be teased out and identified. Although beyond the scope of this report, a program-by-program analysis might explore whether different students of certain races and/or ethnicities are concentrated in particular career areas, or whether some groups are evenly distributed among the programs, and thus show a greater propensity to take CTE courses overall.

The reasons for the racial/ethnic differences between CTE and non-CTE students cannot be discerned.

Economic Differences and Special Education

The finding that a significantly higher percentage of CTE students than of non-CTE students were economically disadvantaged could be a function of the intent to go to college. As stated above, the postsecondary enrollment rate was lower for economically disadvantaged

students than for other groups in 2007 and 2008. Another possible explanation is that economically disadvantaged students were more likely to need to work upon graduation, whether they attended college or not. They could have been aware that taking CTE courses, especially a sequence of courses, might help them get a higher paying job. In fact, statewide occupations that require certificates or associates degrees pay $15,000 more annually on average than do occupations that only require a high school diploma or less (Combs, 2008).

A significantly higher percentage of CTE students than of non-CTE students were economically disadvantaged, and a significantly lower percentage were in special education.

So the fact that economically disadvantaged students were overrepresented in CTE might actually have benefitted this group. Besides offering the possibility of a career with higher pay after high school, participation in CTE could have opened the doors to college (i.e., by presenting it as a possibility and offering college credit for CTE courses)—doors that most of these students might have assumed were closed to them.

Although the analysis found that a significantly lower percentage of CTE students than of non-CTE students were categorized as special education, the difference between the two groups was small (2%) and may not be significant in a practical or meaningful sense. For example, if the percentages had been equal, about 210 more special education students would have been enrolled in high school CTE programs. The CTE program administrators should continue their efforts to ensure that all CTE programs on all campuses are accessible to students in special education.

Differences in Academic Achievement

CTE courses are expected to develop and support the academic achievement of the students who take them. In most cases, CTE course sequence takers had higher TAKS scores and passing rates on all TAKS tests than did non-CTE students. When students who took random CTE courses were included in the analysis, the TAKS passing rate was still significantly higher on most tests for CTE students, but their TAKS scores were lower. These results demonstrate that CTE was successful, especially with course sequence takers, in attracting high achievers and was not, as historically has been the case nationally, a "dumping ground" for low achievers.

CTE attracted high achievers; CTE was not a "dumping ground" for low achievers.

Differences in Postsecondary Enrollment

Concerning postsecondary education results, CTE participation was not found to be a significant determinant of postsecondary enrollment. The factors that characterized students who did enroll (e.g., being female, having higher TAKS math scores, and not being ELL or economically disadvantaged) were consistent with findings from previous studies of postsecondary enrollment determinants (Garland, 2009). It makes sense that academic achievement and economic disadvantage played stronger roles in the decision to go to college or trade school than did taking a sequence of CTE courses. One might imagine many scenarios in which CTE successfully prepared students for college or trade school and motivated them to apply; however, that motivation and preparation might not have been sufficient to determine enrollment. For example, CTE course sequence takers might have wanted to attend college or trade school but lacked the necessary resources.

CTE was not found to be a significant determinant of postsecondary enrollment.

Better ways may exist to determine whether CTE status influenced student postsecondary enrollment. It might be useful to see whether CTE students as a group were more or less likely to intend to go to college or trade school, as measured by the high school exit and school climate surveys. Knowing student intentions could help CTE administrators understand which students are becoming CTE course sequence takers and whether guidance regarding how to enroll and afford college would be useful for the group. Also, it is suggested that outcomes for CTE students who earned college credit in high school through the program be examined. Looking at the outcomes of students who earned college credit through CTE participation could demonstrate whether addressing the cost obstacle would make a difference in the influence CTE has on postsecondary enrollment.

The lack of significant influence of CTE course sequence taker status on postsecondary enrollment outcomes also could be a consequence of the limitations of the data and/or of the statistical model. As stated above, most career schools and colleges in Texas were not included in the postsecondary enrollment dataset. It is possible that acquiring enrollment data from a larger number of career schools could reveal an impact of CTE status on postsecondary enrollment. Also, CTE self-selection bias was not explored in this study. One way this bias could manifest itself would be if students not intending to go to college were more likely to select CTE course sequences, for instance. Controlling for other factors that could influence postsecondary enrollment decisions (e.g., the careers and educational achievement level of parents, the level of student motivation, and high school quality) could possibly reveal an influence of CTE status that was not detected in this analysis.

Differences in Work Status

CTE course sequence taker status was not found to be a determining factor in whether a student was working within 4 months of graduation. This finding was a bit more surprising than the postsecondary enrollment results because economic disadvantage alone would not be considered as large an obstacle to obtaining work as it might be to attending college. Having appropriate skills would seem to provide an effective motivating factor for graduates to seek employment as well as an advantage over others in obtaining a job in a particular area.

What this study does not tell is why CTE participation was not a significant determinant of obtaining work soon after graduation. One possible explanation is that the period covered by the data, the third quarter of 2008, did not cover a sufficient time period after graduation. Students who obtained employment after September were not counted, and students may have secured employment after this time frame. It might be useful to analyze what CTE students stated as their intentions upon graduation. This might indicate whether CTE students were seeking employment. Another possible explanation is that a significant number of CTE course sequence takers with no record of employment or postsecondary enrollment were actually enrolled in a career school or college not included in the enrollment dataset.

CTE sequence taker status was not found to be a determining factor in whether a student was working within 4 months of graduation.

It is important to know whether the skills CTE course sequence takers learned helped them obtain work. This analysis does not provide evidence that they did. Further inquiry is recommended to determine whether students obtained employment after the third quarter of 2008, and also whether those who earned certificates or licenses fared better in securing employment, compared with course sequence takers who did not.

RECOMMENDATIONS

In the interest of providing equal opportunity to students to pursue the career of their choice, expanding CTE opportunities, and better understanding the program's impact on students, the following actions are recommended.

For the CTE administration:

- Develop and disseminate materials that describe CTE programs and opportunities, location of programs, and the benefits to students seeking to attend college or join the workforce upon graduation. Use the materials to promote CTE with the goal of expanding general offerings and course sequence opportunities on campuses.
- Develop and implement strategies to encourage female students to take courses in CTE programs that are not traditionally attractive to females (e.g., engineering).

- Continue to ensure all CTE programs on all campuses are accessible to students in special education, and teachers are aware of and are able to implement modifications to accommodate students in special education.

For other departments with college and career readiness goals:

Any department that shares college or career information with students should collaborate or increase its collaboration with CTE so those efforts are coordinated and strengthened for the benefit of students. For example:

- Guidance and Counseling staff play an important role in recruiting CTE students. School guidance counselors should make students aware of opportunities to gain college credit or certifications through CTE courses. They could work with CTE staff to encourage female students to take nontraditional courses. They could train CTE teachers in the college and career software students use (i.e., Naviance), so CTE teachers could be aware of the colleges and programs that excel in particular career areas and be another voice in guiding students to those opportunities.
- The Offices of Middle and High Schools could use the expertise of CTE staff to better inform school principals about CTE programs and benefits for students.
- The Offices of Middle Schools and School Redesign, both responsible for the implementation of student advisory, could work with CTE staff to develop and provide curriculum about college and careers in their respective advisory programs.

For DPE:

- Conduct research to determine whether students who intend to go to college are taking CTE courses and whether additional obstacles to female participation exist in CTE.
- Conduct a program-by-program analysis to explore whether different ethnicities of students are concentrated in a particular career area.
- Obtain enrollment data from career colleges and schools not included in the NSC dataset.
- Obtain and analyze TWC data for the fourth quarter of 2008 and identify the work outcomes of certificate and license earners.

APPENDICES

Appendix A. CTE Middle School Programs, 2008–2009

Middle school	Skills for Living	Tech Ed	Business	Career Investigation	Project Lead the Way–Gateway to Technology
Ann Richards			X		X
Bailey	X	X	X		
Bedichek	X	X	X	X	X
Burnet	X	X	X		
Covington		X	X	X	
Dobie	X	X	X	X	
Fulmore		X	X		
Garcia	X	X	X		
Kealing	X	X	X	X	
Lamar	X	X	X	X	
Martin		X	X	X	
Mendez	X	X	X	X	
Murchison		X	X	X	
O'Henry		X	X		
Paredes	X	X	X		
Pearce	X	X	X	X	
Small	X	X	X	X	
Webb	X	X	X		

Appendix B. CTE High School Programs and Career Pathways, 2008–2009

Program Area: Agricultural Science and Technology Education

Pathways:

Agricultural mechanics
Animal and food production
Animal science
Horticulture

Program Area: Business and Marketing Education

Pathways:

Accounting/finance
Information technology
Management
Marketing

Program Area: Family and Consumer Sciences Education

Pathways:

Culinary arts
Education
Hospitality

Program Area: Health Science Technology Education

Pathways:

Therapeutic services

- nursing
- pharmacy
- emergency medical services

Program Area: Technology Education

Pathways:

Architecture
Communication and media
Engineering

Program Area: Trade and Industrial Education

Pathways:

Computer support
Cosmetology
Criminal justice
Firefighting
Production media
Transportation

Appendix C. CTE Programs and Career Pathways, by High School, 2008–2009

		Akins	Anderson	Austin	Bowie	Crockett	Garza	Eastside Memorial
Program area:	**Agricultural Science and Technology Education**							
Pathways:	Agricultural mechanics							
	Animal and food production	x			x			
	Animal science	x			x			
	Horticulture	x					x	
Program area:	**Business and Marketing Education**							
Pathways:	Accounting/finance	x	x		x	x		
	Information technology	x	x	x	x	x		
	Management	x			x	x		
	Marketing		x					
Program area:	**Family and Consumer Sciences Education**							
Pathways:	Culinary arts			x	x			x
	Education	x		x		x		
	Hospitality				x			
Program area:	**Health Science Technology Education**							
Pathways:	Therapeutic services							
	· nursing	x				x		x
	· pharmacy	x				x		
	· emergency medical services	x						
Program area:	**Technology Education**							
Pathways:	Architecture							
	Communication and media	x	x	x	x	x		
	Engineering	x	x					

		Akins	Anderson	Austin	Bowie	Crockett	Garza	Eastside Memorial
Program area:	**Trade and Industrial Education**							
Pathways:	Computer support	x				x		
	Cosmetology					x		
	Criminal justice	x					x	
	Firefighting							
	Production media		x	x		x		
	Transportation					x		x

		Lanier	LASA	LBJ	McCallum	Reagan	Travis
Program area:	**Agricultural Science and Technology Education**						
Pathways:	Agricultural mechanics	x					
	Animal and food production	x					
	Animal science						
	Horticulture	x					
Program area:	**Business and Marketing Education**						
Pathways:	Accounting/finance	x		x	x		
	Information technology	x		x	x		
	Management					x	
	Marketing				x		
Program area:	**Family and Consumer Sciences Education**						
Pathways:	Culinary arts						x
	Education						
	Hospitality						x
Program area:	**Health Science Technology Education**						
Pathways:	Therapeutic services						
	· nursing	x					x
	· pharmacy	x					
	· emergency medical services						
Program area:	**Technology Education**						
Pathways:	Architecture						
	Communication and media						x
	Engineering		x	x		x	

		Lanier	LASA	LBJ	McCallum	Reagan	Travis
Program Area:	**Trade and Industrial Education**						
Pathways:	Computer support	x	x				x
	Cosmetology	x					
	Criminal justice	x					x
	Firefighting			x			
	Production media		x		x		x
	Transportation					x	

Appendix D. CTE Certification Opportunities by Program Area, 2008–2009

Career and technical program area	Certification
Agricultural Sciences and Technology	Certified Veterinary Assistant Outdoor Power Equipment Technician Private Pesticide Applicator License Texas Certified Nursery Professional OSHA Ten Hour Safety Certification Texas State High School Floral Certification
Business and Marketing Education	Microsoft Office Users Specialist (MOS): Word, Excel, PowerPoint National Professional Certification in Customer Service Office Proficiency Assessment Certification (OPAC) Certified Customer Service Specialist Certified Professional Salesperson

Career and technical program area	Certification
Family and Consumer Sciences	Banquest Setup Employee Banquet Server Bell Attendant Busperson Certified Rooms Division Specialist Child Development Associate Concierge Educational Aide I Front Desk Representative Guest Room Attendant Laundry Attendant Lodging Management Passport Lodging Management Program (LMP) Public Space Cleaner Reservationist Restaurant Server ServSafe
Health Science Technology	Certified Medical Assistant (CMA) Certified Nurse Aide (CNA) CPR/First Aid Emergency Care Attendant (ECA) Emergency Medical Dispatcher (EMD) Emergency Medical Technician (EMT) Licensed Vocational Nurse (LVN) National Health Care Foundation Skill Standards Pharmacy Technician (CPhT)
Technology Education	Autodesk AutoCAD 2008

Career and technical program area	Certification
Trade and Industrial Education	A*S*K
	A+
	Adobe Certified Expert (ACE) Photoshop, In-Design, Illustrator
	Adobe Dreamweaver Certification
	Adobe Flash Certification
	Adobe Illustrator
	Adobe Photoshop 7.0 Certification
	Audio/Video Distribution
	Automobile Service Consultant
	Certified Internet Webmaster (CIW)
	Computer Service Technician
	Cosmetology License
	Final Cut Pro
	IC3
	I-Net+
	IT Essentials Certificate, Level 1
	Network+
	OSHA Ten Hour Safety Certification
	ServSafe
	TCLEOSE 311/911 Dispatch Operator

Appendix E. CTE Internship Opportunities, by Program Area, 2008–2009

Program area: Family and Consumer Science Education

Pathway: Education (Ready, Set, Teach)

Internships placements:

- Manchaca Elementary
- Mathews Elementary
- Casis Elementary
- Sanchez Elementary

Pathway: Hospitality

Internships placements:

- Omni Hotel
- Four Seasons Hotel
- Radisson Hotel
- Barton Creek Resort and Spa

Program area: Health Science Technology Education

Clinical rotations:

- Seton Hospitals
- St. David's Hospitals
- South Austin Hospital
- West Oak Rehabilitation Center

Appendix F. CTE Student Organizations, by Program Area, 2008–2009

Agricultural Sciences and Technology:

Texas Association of Future Farmers of America

Business and Marketing Education:

Business Professionals of America

DECA - Distributive Education Club of America

Texas FBLA - Future Business Leaders of America

Family and Consumer Sciences:

Family, Career and Community Leaders of America

Health Science Technology:

Health Occupations Students of America

Technology Education:

Texas Technical Students Association

Trade and Industrial Education:

Skills USA

Appendix G. Results of Logistic Regressions Measuring Determinants of Postsecondary Enrollment and Work Status

Independent variable	Dependent variable	
	Enrolled in postsecondary education	Working third quarter of 2008, not enrolled
	Odds ratios	
Female	1.48	NS
Asian	NS	0.22
Not economically disadvantaged	2.42	NS
Not ELL	1.54	3.07
TAKS math score	1.004	0.999

Note. Only independent variables found to be statistically significant ($p < .01$) are included here.

A logistic regression was run with data for 2008 high school graduates using postsecondary enrollment in a college or trade school as the binary dependent variable. The independent variables were CTE course sequence taker status, gender; race/ethnicity; ELL status; special education status; economic disadvantage; and academic achievement, as measured by the math TAKS scale score. For the general analysis, dummy variables for school characteristics also were added. These included a dummy for school size (large/small) and one for a school's percentage of economically disadvantaged students (high/low). A separate analysis was conducted by campus without the school dummies. These campus analyses were also run with the binary dependent variable being whether a 2008 graduate who was not enrolled in a postsecondary educational institution was working within four months of graduation. CTE was not found to be a significant determinant of either postsecondary enrollment or work status.

REFERENCES

Combs, S. (2008). *Texas works: Training and education for all Texans* (96-1361). Austin, TX: Texas Comptroller of Public Accounts.

Garland, M. (2009). *Postsecondary enrollment summary report: Classes of 2002–2008* (Publication 08.58). Austin, TX: Austin Independent School District.

Levesque, K., Laird, J., Hensley, E., Choy, S. P., Cataldi, E. F., & Hudson, L. (2008). *Career and technical education in the United States: 1990 to 2005* (NCES 2008-035). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Mithaug, D. E. (1994). Equity and excellence in school-to-work transitions of special populations. *CenterFocus, 1*(6). Retrieved from http://vocserve.berkeley.edu/CenterFocus/CF6.html

National Consortium for Product Quality in Vocational Education (NCPQVE). (1994). SCANS: How does it measure up in 1994? *Standard Times, 1*(1). Retrieved from http://vocserve.berkeley.edu/ST1.1/SCANS.html

Stone, J. R., & Aliaga, O. A. (2005). Career & technical education and school-to-work at the end of the 20th century: Participation and outcomes. *Career and Technical Education Research*, *30*(2), 125–144.

William T. Grant Foundation. (2009). *Foundation history*. Retrieved from http://www.wtgrantfoundation.org/about_us/foundation_history/foundation_history

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