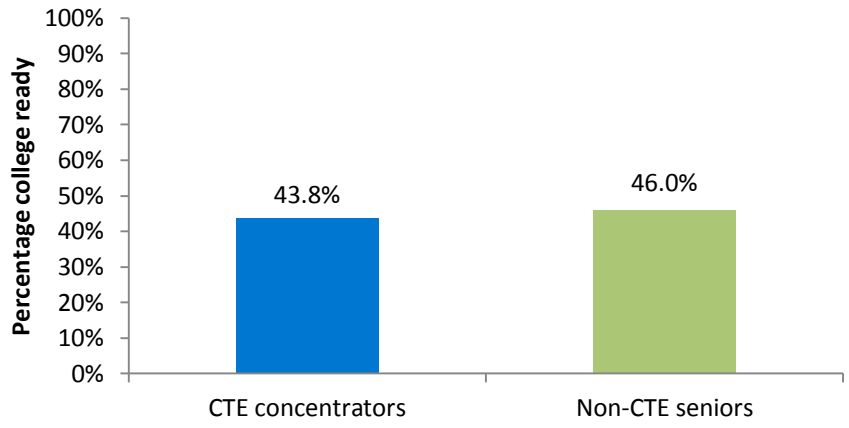
Career and Technical Education: College Readiness and Cost-effectiveness

Department of Research and Evaluation
Austin Independent School District

How should the success of the Career and Technical Education (CTE) program be measured?

The CTE program provides opportunities for students to acquire 21st century academic and technical skills needed for entry into the global workforce and into postsecondary education. At first sight, it appears that the success of the CTE program could be measured by comparing the workforce participation and postsecondary enrollment of graduates who concentrated in CTE courses with those of graduates who did not. However, graduates seeking to obtain employment or enroll in a postsecondary school could confront obstacles unrelated to the effectiveness of the CTE program. As such, this report compares the college readiness* of 2010–2011 seniors who were CTE concentrators with that of all other (non-CTE) seniors. Of the 4,582 seniors in 2010–2011 with college-readiness data available, 2,089 (45.6%) were college ready.

Figure 1. No significant difference existed between the college readiness of Career and Technical Education (CTE) concentrators and of non-CTE seniors.



Source. AISD student course enrollment, exit-level Texas Assessment of Knowledge and Skills (TAKS), American College Test, and SAT test files prepared by the Department of Research and Evaluation.

CTE Concentrators

The seniors in this study were considered CTE concentrators if (a) their 4-year plan of courses reflected the intent to take a sequence of two or more CTE courses for three or more credits, (b) they took one of the CTE courses in the sequence prior to their senior year, and (c) they either took an upper-level CTE course in the sequence their junior year that met the credit requirement or they took such a course their senior year. If the seniors' 4-year plan included a Tech Prep course (i.e., with articulated credit at the postsecondary level), the student was coded as a 3. If the upper-level course was not articulated, the student was coded as a 2. Code 2 and 3 seniors were chosen as a unit of study for CTE program evaluation because the sequential course of study provided them with a foundation for a career, as opposed to CTE code 1 seniors, who took random CTE courses, and CTE code 0 seniors, who did not take any CTE courses. Any seniors not identified as code 2 or 3 were considered non-CTE.

Who was included in the college readiness analysis?

During the 2010–2011 school year, 4,937 seniors were enrolled. Of these, 778 (15.8%) were CTE concentrators. However, only 4,582 (93%) of all seniors had available Texas Assessment of Knowledge and Skills (TAKS) scores in English language arts (ELA), composition, and mathematics (math) and/or SAT or American College Test (ACT) scores from which to calculate college readiness. Of the seniors with college readiness data available, 768 (16.8%) were CTE concentrators.

* The Texas standards for college readiness are provided at the end of this report.

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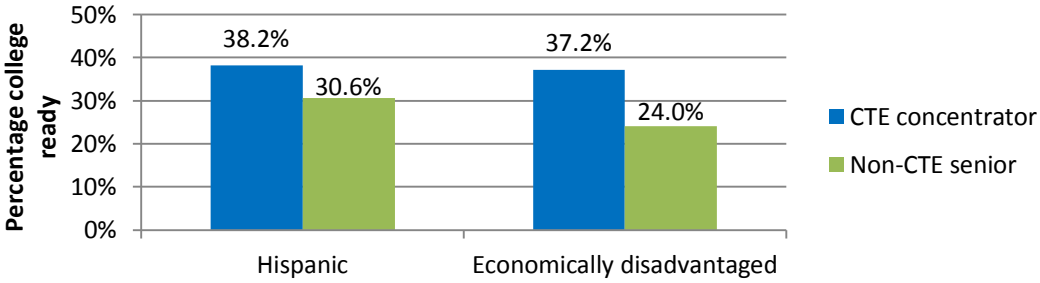
CTE concentrators were disproportionately Hispanic and economically disadvantaged, compared with non-CTE concentrators. According to Texas Education Agency (TEA) accountability reports, these student groups historically have had lower college readiness rates than their counterparts have had. Thus, one would expect the college readiness of CTE seniors to be lower than that of non-CTE seniors. That was not the case, as demonstrated in Figure 1, because the college readiness rates of Hispanic and economically disadvantaged seniors who concentrated in CTE were higher than those of non-CTE seniors in these students groups.

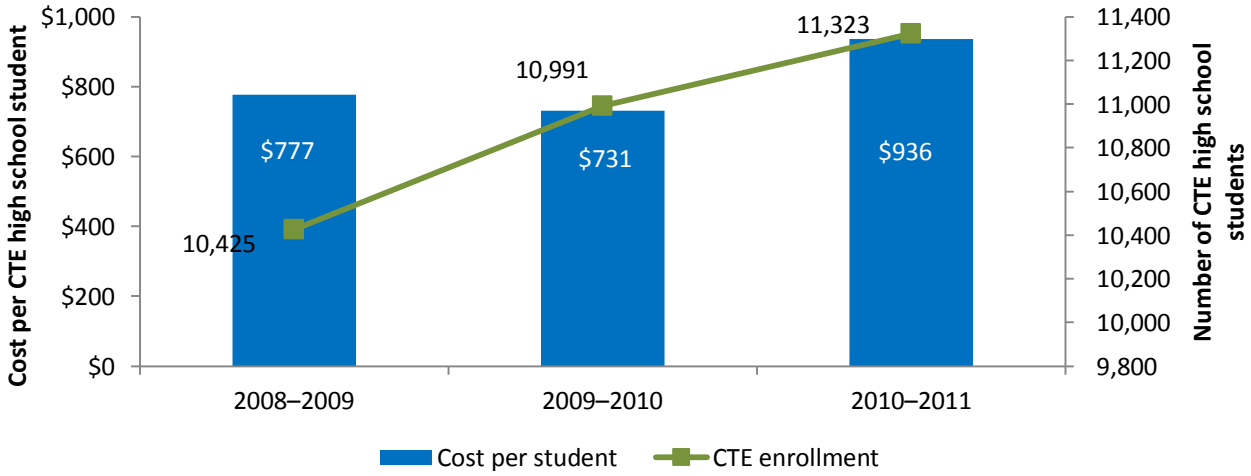
Figure 2. A higher percentage of Hispanic and economically disadvantaged seniors who participated in Career and Technical Education (CTE) than of Hispanic and economically disadvantaged non-CTE seniors were college ready.



Is the CTE program cost-effective?

CTE expenditures increased 31% from 2008–2009 to 2010–2011, from $8.1 million to $10.6 million. Student enrollment in CTE increased 9% during the same period. However, a district accounting error in years prior to 2010–2011 resulted in the CTE program being allocated less funding than was accurate in those years. The error was corrected in 2010–2011, and that correction accounted for the large increase in expenditures. Therefore, caution must be used in interpreting year-to-year data that use monetary values. The average cost per student over the 3 years was $817 a year.

Figure 3. The cost per Career and Technical Education (CTE) high school student varied per year, while CTE enrollment increased steadily.



Source. AISD CTE program budgets and student enrollment data prepared by DRE
Note. The cost per CTE high school student calculation includes actual total expenditures by CTE divided by the number of all CTE students (codes 1, 2, and 3).

The unit of effectiveness used for the cost-effectiveness analysis was the college readiness of 2011 seniors who were CTE concentrators. These CTE concentrators were enrolled in AISD for the last 3 years of high school, and took at least one CTE course each year. These criteria were specified to include only students whom CTE had an opportunity to influence in terms of college readiness. The costs included per student expenditures for 3 school years, using actual annual expenditures.

Of the 524 CTE seniors in CTE for 3 years, 234 (44.7%) were college ready. The cost of educating each of the 524 CTE seniors over the 3 years was $2,444. However, the per student cost of getting the "effect" of college readiness after 3 years was $5,473.

What are the limitations of the analysis?

Results from this analysis are presented with the following limitations for consideration. The lack of data from a similarly sized CTE program in another district to use as a comparison makes it difficult to interpret these results. CTE may be more successful than the regular curriculum at raising the academic levels of Hispanic and economically disadvantaged students, so a cost-effectiveness comparison for these student groups could be useful. Research into how such a comparison could be conducted is underway.

The results of the analysis presented in this report may not be directly compared with the prior year's cost-effectiveness study. In the 2009–2010 cost-effectiveness analysis, budgeted costs were used, rather than actual expenditures. As presented in this report, the use of actual expenditures provides a more accurate and meaningful view of cost-effectiveness. Also, the 2009–2010 school year was the last year before the accounting error was corrected, so the 3 years of budgeted costs used to calculate cost-effectiveness were significantly lower than expenditures were in 2010–2011, and significantly lower than they likely will be in future years, given the allocation correction. Therefore, using the results of the 2009–2010 and 2010–2011 analyses to compare cost-effectiveness over time is not appropriate.

Definition of College Readiness

According to the TEA's Academic Excellence Indicator System, to be considered college ready in **English**, a student must

- obtain a 2200 scale score or higher on the ELA TAKS and a 3 or higher on the composition; **OR**
- achieve a score of at least 500 on the English portion of the SAT, with a composite score of at least 1070; **OR**
- achieve a score of at least 19 on the English portion of the ACT, with a composite score of at least 23.

To be considered college ready in **math**, a student must

- achieve a scale score of at least 2200 on the math TAKS; **OR**
- achieve a score of at least 500 on the math portion of the SAT, with a composite score of at least 1070; **OR**
- achieve a score of at least 19 on the math portion of the ACT, with a composite score of at least 23.

For this report, only seniors college ready in both English and math were deemed college ready.

Notes About CTE Budgets and Cost-effectiveness Methodology

Three years of CTE actual expenditures at the high school level were used to calculate the cost per CTE student and cost-effectiveness. Expenditure categories included payroll, contracted services (including construction costs), supplies and materials, professional development, and capital outlays. Funding sources for CTE included the following:

- Local 199 funds (state funds that go to the district for CTE, including payroll costs)
- Carl D. Perkins grant (federal funding for CTE programs)

- Tech Prep (state program funds)
- Rio Grande (funds from the sale of an AISD campus to ACC)
- E3 Alliance (grant funds)
- American Recovery and Reinvestment Act (ARRA) funds

To calculate the cost per student, the total number of CTE students that year was divided into the corresponding year's budget. The 3 years of per student costs were added to get a single per student cost. For the cost-effectiveness analysis, the per student cost was multiplied by 524 to get a total cost of serving all the CTE concentrators who took at least one CTE course during their sophomore, junior, and senior years. That total was divided by the 234 who were college ready, resulting in the cost of producing one college-ready CTE concentrator.

Funding Sources

Funding for the development of this report was provided by the CTE program.

About the Department of Research and Evaluation

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

About the Author

Carol Pazera joined DRE in 2009 and focuses on programs and initiatives implemented for middle and high school students. Carol has specialized in research and evaluation for more than 15 years. Throughout her career, she has assisted numerous nonprofit organizations in the development of evaluation processes and instruments. She also co-founded and led an agency that served high school students in Austin who were at risk of dropping out of school. Carol earned a B.A. in secondary education from the University of Illinois at Champaign-Urbana, an M.A. in Latin American Studies, and an M.S. in Community and Regional Planning from the University of Texas at Austin. She has been a member of the American Evaluation Association since 2005.