



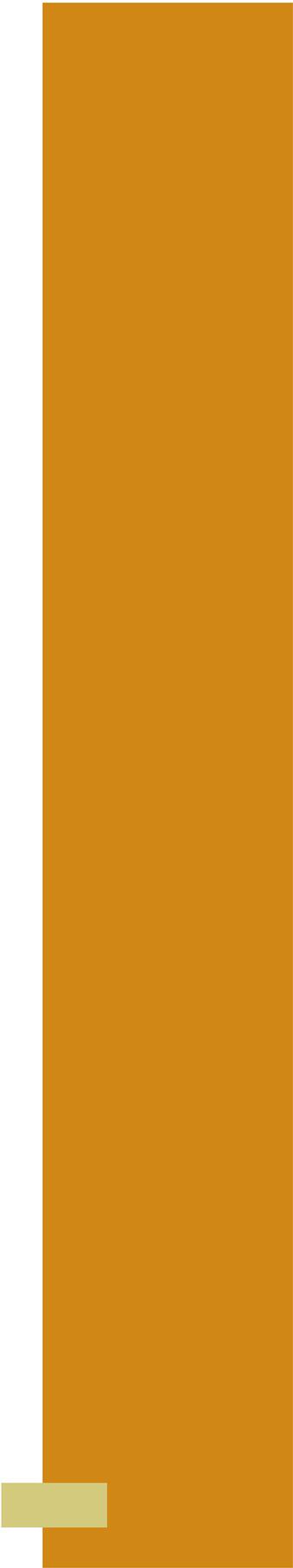
# Career and Technical Education in New York State

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## Final Evaluation Report 2005-06

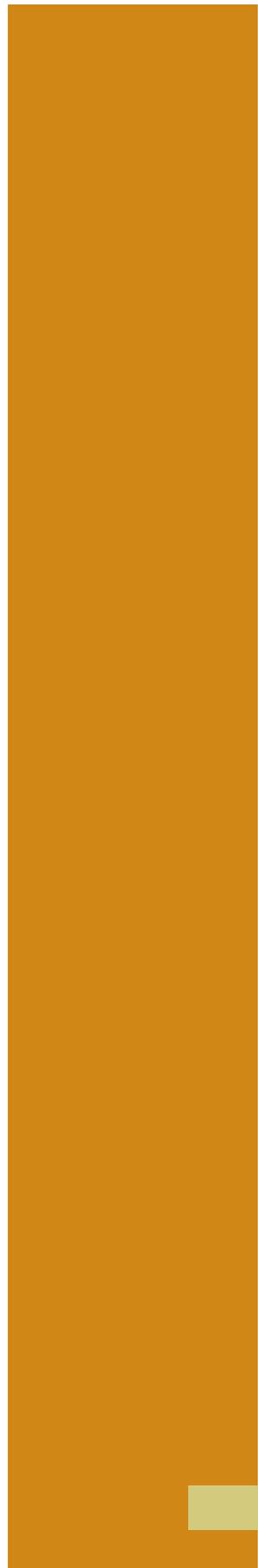


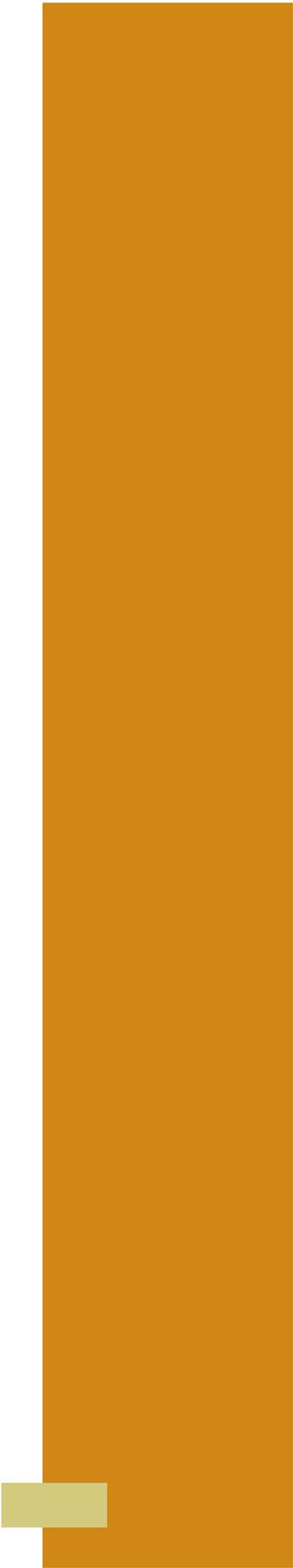
**MAGI Educational Services**  
A Measurement Incorporated Company



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## Executive Summary

New York State’s Career and Technical Education (CTE) Policy of 2001 was established as a means to improve the design and quality of CTE programs and to offer students a flexible pathway to graduation—one that maintained academic and technical rigor, without duplication of coursework. **MAGI Educational Services, A Measurement Incorporated Company** has, for the past two years conducted the independent evaluation of statewide CTE programs. Our third and final evaluation of the initiative was undertaken to understand more fully the issues surrounding program quality and student outcomes. Specifically, we wanted to take a closer look at the academic content in approved CTE curricula, to compare the rate of CTE leavers (non-completers) with that of high school dropouts, and to determine the impact of CTE on high school student attitudes and academic achievement.

### *Highlights*

#### **Academic Rigor of CTE curricula**

- A majority of CTE courses reflected ELA and mathematics content at commencement level.
- A few CTE courses lack sufficient opportunities for abstract learning.

#### **CTE Leaver and High School Dropout Rates**

- The CTE leaver rate declined over a two-year period, while that of high school dropouts was on the rise.
- Fewer minority students withdrew from CTE programs than from high school.

#### **Impact of CTE on Student Attitudes**

- CTE and non-CTE students did not significantly differ in their attitudes towards high school.
- There were no significant differences between CTE and non-CTE students in their exposure to work-based learning.
- Dual credit had a greater impact on CTE students’ decisions to attend college.
- More CTE students received help in planning their future than did

their non-CTE peers.

- More CTE students had clarity in career direction.
- CTE appeared to significantly enhance high school relevance for minority students.

### **Impact of CTE on Student Achievement**

- Overall, there were no significant differences between CTE and non-CTE students in ELA and mathematics achievement.
- Female students in non-CTE programs performed significantly better than those in CTE programs on the ELA exam.

## **Conclusions**

### **1. Commencement-level academic content was evident in most CTE curricula. Still, improvement is warranted.**

Independent review of a sample of CTE curricula showed that by and large, the curricula represented a level of rigor commensurate with the NYS Learning Standards. The ELA and mathematics content were embedded in authentic learning experiences that challenged students to engage in critical thinking, involving complex application of language and quantitative skills. Yet, there was also a small proportion of CTE curricula that needed enhancement—such as opportunities for more abstract learning.

### **2. The CTE leaver rate was on a downward trend, while the high school dropout rate was on the rise.**

Over a two-year period, the proportion of CTE non-completers declined, but the high school dropout rate increased. These overall trends held true for gender, race, and special education status and were consistent with earlier findings. Specifically, from our previous evaluations of the CTE initiative we know that the quality of CTE curricula had improved, and more students in CTE programs graduated with Regents diplomas.

### **3. CTE and their non-CTE peers shared similar views about their high schools.**

Contrary to prior research, there were little to no significant differences between the high school perceptions of CTE and non-CTE students. Overall, both groups of students were satisfied with their high school programs and intended to go to college. However, slightly more CTE

students expressed clarity of future goals and certainty about their career choices.

#### **4. Significantly more minority students in CTE programs than in non-CTE programs felt that high school was a relevant and meaningful experience.**

More African-American and Hispanic students in CTE programs rated their high school experience as relevant to their lives, than did their peers in non-CTE programs. We also found that fewer minority students withdrew from CTE programs than from high school in general. If the CTE experience contributed to their perception of high school relevance, then it appears that they were more likely to persist to graduation.

#### **5. Students in CTE programs performed as well as non-CTE students on measures of academic achievement.**

There were no significant differences between the groups, indicating that CTE membership did not detract from academic achievement. Put differently, CTE students did academically no better and no worse than their counterparts in non-CTE programs on New York States Regents examinations.

In conclusion, our findings provide credible support for the continued development and enhancement of statewide approved CTE programs. Students in these programs are for the most part, offered curricula that are characterized by rigorous standards. Not only do students perform academically at par with their classmates in non-CTE programs, but they also derive additional value: a more relevant high school experience, and greater readiness to chart their future. For many students, in particular an increasing number of minority students, CTE may well be the gateway to college and career success. While our study did not follow students into their postsecondary status, there is established evidence that CTE positively influences career experience for both students who enter the workforce right out of high school and those who work while going to college (Silverberg, Warner, Fong & Goodwin, 2004; Westchester Institute for Human Services Research, 1998). High schools, and especially those in need of improvement should strongly consider expanding the reach of approved CTE programs, because the

CTE initiative has shown its capacity to benefit all students.

# Chapter One

## Introduction

**A**mong the myriad initiatives undertaken to reform high school education, the career and technical education (CTE) enterprise has emerged as a serious player. In New York State, the CTE policy of 2001 was instituted as a means to foster improvement in the design and quality of CTE programs, in accordance with the higher learning standards set by the State. In essence, the policy offers students a flexible pathway to graduation—one that maintains academic and technical rigor, without duplication of coursework.



**MAGI Educational Services**, a Measurement Incorporated Company, was contracted to conduct the independent evaluation of New York State's CTE policy. Over the past two years, findings from our state-wide studies have shown significant programmatic improvements in CTE programs <sup>1</sup>. For example, in many high schools and Boards of Cooperative Educational Services (BOCES), more innovative programs such as robotics, digital electronics and a host of other technical subjects central to engineering and advanced manufacturing had replaced traditional programs in machining and sheet metal. And in other districts, carpentry, electricity and plumbing were now part of broader programs in construction technology that introduce students to entrepreneurship, computer-assisted drafting and design, and architecture. These changes resulted in enrollment increases, academic and technical skill attainment, and stakeholder satisfaction. Further, more students electing the CTE pathway were graduating with Regents diplomas and many more than prior to the policy, were going to college.

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<sup>1</sup> MAGI's previous evaluation reports can be found at <http://www.regents.nysed.gov/2004Meetings/December2004/1204emscvesidd2att.pdf> and <http://www.emsc.nysed.gov/workforce/careerdevelopment/docs/CTE/EvaluationReport2005.pdf>

Still, questions remained about the implementation and impact of CTE programs, necessitating a closer look at the academic content in CTE programs and at student outcomes. These issues shaped our third and final study of New York State's CTE programs. We posed three broad evaluation questions:

1. To what extent does CTE curricular content reflect New York State (NYS) academic standards at the commencement level?
2. How does the CTE leaver rate compare with the high school dropout rate?
3. What is the impact of CTE programs on high school student attitudes and outcomes?

Because these questions reflect discrete research areas, they are treated independently in separate chapters of this report. Within each chapter, we describe our methods for data collection and analyses, and the resulting key findings.

## Chapter Two

### The Academic Quality of CTE Curricula

*To what extent does CTE curricular content reflect NYS academic standards at the commencement level?*

CTE programs that have secured NYSED approval offer students an opportunity to earn units of academic credit in core content areas—English Language Arts (ELA), mathematics, science, or social studies—after they have passed the required Regents examination(s) in that core academic subject. For this reason, CTE courses/curricula are expected to meet NYS’ academic Learning Standards.

#### Method

In our previous evaluation study, high school principals characterized the majority of CTE programs as rigorous and at the commencement level. In the current study, we chose to go beyond a perceptual analysis, by reviewing a sample of curricular material from approved CTE programs. Stratifying by state region, CTE location (district-based and BOCES-based), and academic area (ELA and mathematics), we secured a representative sample of 11 CTE courses<sup>2</sup>. Of these, four had been approved to offer ELA credit, another four to offer mathematics credit, and the remaining three offered both ELA and mathematics credit. For this review, CTE programs submitted documents that reflected at least 30% of course lessons, resource material, and student assessment methods.

A panel of four academic content area specialists, two each in ELA and mathematics were asked to review these 11 CTE courses to answer the central question, “Does the course reflect ELA/mathematics content at the commencement level?” Through a blind review process, each content specialist independently gauged the courses’ lessons, resource



<sup>2</sup> In this context, we use the terms courses and curricula interchangeably.

material, and assessment methods, using a rubric that was adapted from curricular review standards established by the New York State Education Department (NYSED)<sup>3</sup>. Accordingly, lessons, resource material, and assessments were rated on a 5-point scale in three areas: (a) relation to the Learning Standards; (b) intellectual challenge; and (c) engagement.

### **Scoring and Analysis**

The final score ascribed to a CTE course was the average rating given by two content specialists in the same academic area. CTE courses that offered both ELA and mathematics credit received two final scores—the average rating of two ELA reviewers and that of the two mathematics reviewers. Where discrepancies between raters resulted in greater than 5 points on a final score, they were asked to resolve their differences by re-reading and re-scoring the documents. In order to identify the CTE courses whose academic content was at commencement level, the average ratings were subject to the *60% criterion*. In other words, a course whose average ratings reflected that at least 60% of its lessons, resource material, and assessments had met the Learning Standards was deemed to be at commencement level<sup>4</sup>.

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<sup>3</sup> The rubric was based on research from the curriculum field and a similar scale from NYSED's Academy for Teaching and Learning.

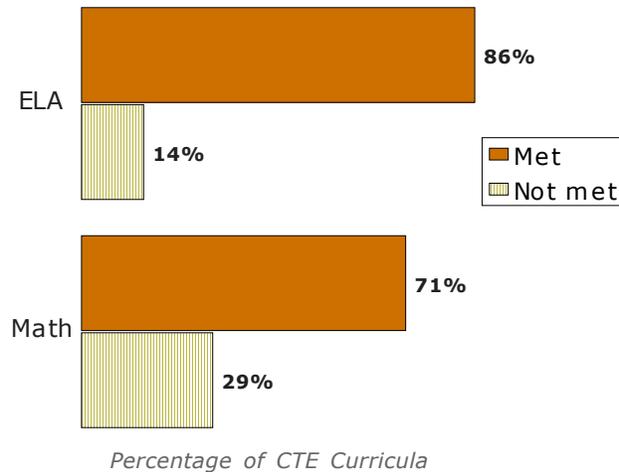
<sup>4</sup> The 60% criterion is applied in several educational contexts. For example, the basic level of educational significance is an effect size of 0.25, which corresponds to an area comprising 60% under the normal curve distribution. Also, a performance level of "3" (proficient) on various NYSED assessments corresponds to 60 on a 100 point scale. Therefore, we felt that it was an acceptable criterion.

## Key Findings



**A clear majority of CTE courses reflected ELA and mathematics content at commencement level.**

Figure 1. Percentage of CTE Curricula that met Commencement Level Standards in ELA and Mathematics



According to Figure 1, in the sample of CTE courses reviewed,

- over 80% incorporated ELA content at the commencement level, and
- in the mathematics area, almost three-quarters of the courses did the same.

Content analyses of the commentaries provided by the reviewers highlighted the following themes.



**Course material was aligned to the Learning Standards.**

- Most of the CTE course material was at par with the NYS' Learning Standards, and in some cases, even exceeded them. "Each [lesson] represents a careful integration of ELA and career elements," commented a reviewer. In the words of another, "Material is challenging and beyond commencement level, e.g., the study of vectors."



**Lessons represented a variety of authentic learning tasks.**

- Reviewers noted that students were presented with numerous real-world problems, in which multiple representations of quantities were used.



**There was clear evidence that higher-order skills were involved in mastering the content material.**

- Lesson content, resource material, and assessments indicated that students were expected to think critically. “The vast majority [of lessons] make solid connections to sophisticated mathematics,” and use “texts [that] are supportive of investigative approaches which stress analysis, etc.,” wrote a reviewer.



**A wide range of assessment types was used to spark student motivation.**

- CTE curricular materials assessed student understanding by using both paper and pencil tests and quizzes, and projects that required group problem solving and simulations. “Handouts and projects utilize complex math problems/topics that push students’ level of understanding,” remarked a reviewer. “Projects and tests include measurement conversions, statistics, direct variation, proportions, etc.” They noted that there was much “intrinsic interest” embedded in the crafting of lessons.

*“[The curriculum] covers a variety of math topics in a context that is neither forced nor overly simplistic.”*

**Mathematics content specialist**



**Among the curricula whose ELA and mathematics content did not meet commencement level standards, reviewers noted three areas for improvement.**

- *There was a disconnect between the Learning Standards that the curriculum claimed it addressed and the actual lesson content.* Some curricular matrices and crosswalks indicated that their content covered all the Learning Standards at commencement level. Upon scrutiny of the lesson samples, this was not found to be the case. “The curriculum matrix .....lists over 20 topics which form part of the commencement –level math, but lessons provided do not support these claims,” noted a reviewer. In other curricula, the actual samples showed little ELA information.
- *Rote learning appeared to be the predominant level of student performance.* The lessons provided were very traditional: “A problem is presented and solved, then similar problems are presented for students to solve, with little opportunity for true exploration of concepts.” More abstract and higher-level algebra topics were missing.
- *There was an underutilization of opportunities to engage students in higher-order content material.* In both the ELA and mathematics reviews, content specialists noted that while curricula presented occasions to incorporate more complex and interesting lessons, these had largely been missed. For example, a mathematics reviewer found that, “discussion of compound interest could lead to exponential equations but the curriculum sticks to a purely arithmetic presentation.” Likewise in an ELA review, “given the plethora of literature about crime and courts, a literary component could easily be added—enriching the course considerably and hitting more of the ELA marks!”

Taken together, the independent review of academic content in approved CTE curricula showed that while most CTE courses incorporated ELA and mathematics content at a level of rigor commensurate with NYS' Learning Standards, work remains to bring *all* approved CTE programs to an acceptable standard. As noted by the reviewers, CTE courses, by their contextualized nature, provided many opportunities to build challenging learning problems with sophisticated ELA and mathematics underpinnings. The task ahead is to ensure that CTE staff are equipped with the resources (through professional development and collaboration with academic counterparts) to embed higher-order academic concepts into their curricula. Such training should be ongoing and deep, so that CTE teachers are able to fully exploit the academic-technical connections inherent in their areas of instruction.

## Chapter Three

### A Comparison of CTE Leaver Rates and High School Dropout Rates

*How does the CTE leaver rate compare with the high school dropout rate?*

**I**nterest in this evaluation question stemmed from a body of research suggesting that CTE programs have a mitigating effect on dropout rates, particularly among high-risk students (Wonacott, 2002).

To determine if this held true in New York State, we first had to establish whether CTE leavers (a) dropped out of school, and (b) had similar profiles to high school dropouts. This was necessary because in New York State, there is no such entity as a “CTE dropout”, since districts and BOCES are not required to report whether CTE non-completers drop out of school.



#### Method for determining CTE leaver and high school dropout equivalence

We conducted telephone interviews with a representative sample of 12 CTE program directors and their staff to better understand the nature of CTE leavers, their profile, and factors that influenced their withdrawal from CTE programs. Content analyses of these interviews revealed the following.

#### Key Findings



**By far, the majority of CTE leavers dropped out of high school.**

- According to CTE staff, most leavers were poorly motivated from the outset and had begun to disengage with school well before they entered CTE programs. Occasionally, a CTE leaver returned for technical training as a young adult, “after he’d been knocked around a bit and was more serious about making a better life for himself.”



### **CTE leavers had poor attendance.**

- Personal life circumstances (pregnancy, working to support one's family, incarceration, etc.) led to irregularities in attending the CTE program, with most students having missed more than 50% of the school year.



### **Poor attendance led to poor grades.**

- Many CTE leavers had failed CTE and academic program requirements because they were unable to regularly attend classes. In these instances, they withdrew from both the regular academic and CTE tracks and entered a GED program.



### **CTE leavers had unrealistic expectations of their CTE program of choice.**

- Despite the fact that almost all CTE students elected to attend their programs, upon enrollment, some recognized a mismatch between the program requirements and their expectations. "They don't realize the level of rigor and academic demands that are required," said a CTE instructor. "Some of them just want to hang out." These students shifted to alternate CTE programs but more often than not, CTE staff reported, they were likely to withdraw from those as well.



### **CTE leavers experienced reading problems.**

- CTE administrators and counselors attested that a fair proportion of CTE leavers struggled with the reading demands of the curriculum. According to CTE staff, while reading remediation was available, districts were less willing to absorb the costs of supplemental services at off-campus CTE programs—particularly in times of fiscal downsizing.



## Special education students were rarely represented among CTE leavers.

- CTE staff were quick to point out that a special education classification per se did not contribute to CTE non completion. On the rare occasion that a special education student did not complete his/her CTE program, it was either because of a personal life circumstance or because of geographic relocation.

Based on the above analyses, we were fairly confident that CTE leavers dropped out of school and shared many attributes with high school dropouts (Bridgeland, DiIulio, & Morison, 2006; Olson, 2006; Viadero, 2006). CTE administrators did voice some concern about inconsistencies in how New York State's Career and Technical Education Data System (CTED) was used for reporting leaver data, but these factors did not affect their perceptions of CTE leavers<sup>5</sup>.

### Method for group comparison

Our next step was to compare CTE leaver and high school dropout rates. Drawing from NYSED's databases<sup>6</sup>, we computed the CTE leaver rates for each of two years—2003-04 and 2004-05—and compared them to the dropout rates for the same period to determine if there were any similarities and differences in trends between the two groups. The rates were calculated by the same method, i.e., the number of leavers/dropouts as a proportion of that year's CTE/high school enrollment.

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<sup>5</sup> For example, some CTE administrators do not factor in students from Tech-Prep programs while others do. In the words of a CTE director, "There is an effort underway to standardize the understanding of definitions, but I remain very concerned about the lack of understanding and consistency across the state in reporting the CTEDS data."

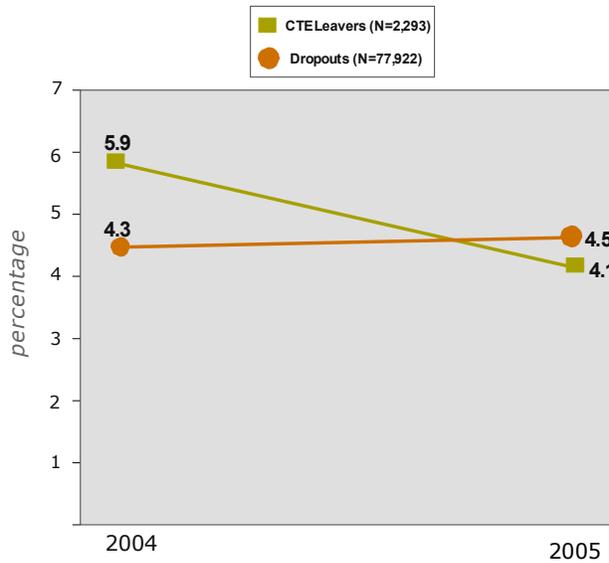
<sup>6</sup> The CTE leaver data was drawn from the CTEDS and the dropout data was supplied to us from the STEP (System for Tracking Educational Performance) database.

## Key Findings



The CTE leaver rate declined over the two-year period, while that of high school dropouts was on the rise.

Figure 2. Change in the Percentage of CTE Leaver Rate and Dropout Rate



As seen in Figure 2, there were differences in trend between CTE leavers and high school dropouts.

- There were more CTE leavers than high school dropouts in 2003-04, but by the following year, that trend had reversed. The proportion of high school dropouts increased by 0.2% across the two years. On the other hand, the CTE leaver rate had decreased by 1.8%.



These trends were consistent across gender, ethnicity, and special education status (see Figures 3, 4, and 5).

Figure 3. Change in the Percentage of CTE Leavers and Dropouts by Gender

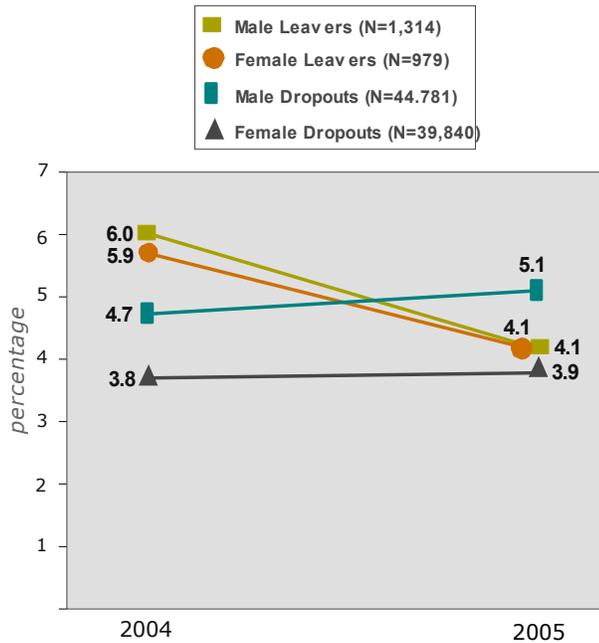


Figure 4. Change in the Percentage of CTE Leavers and Dropouts by Ethnicity

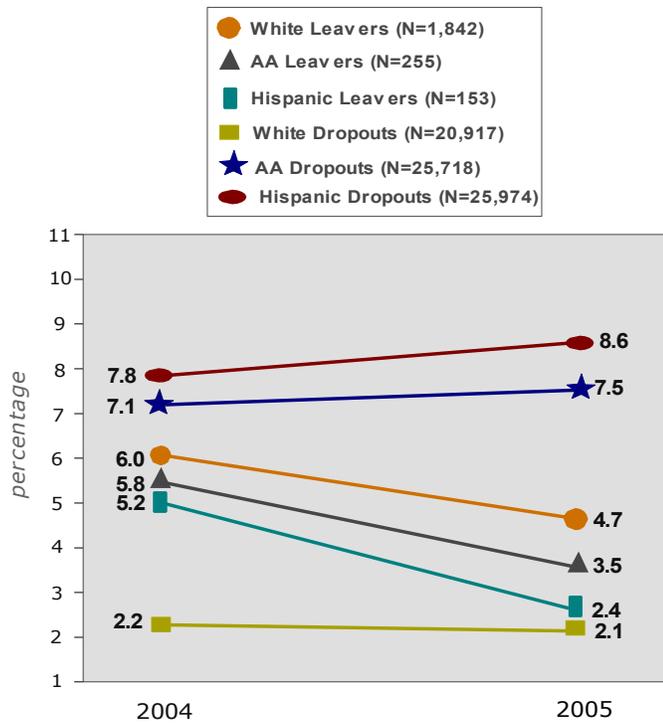
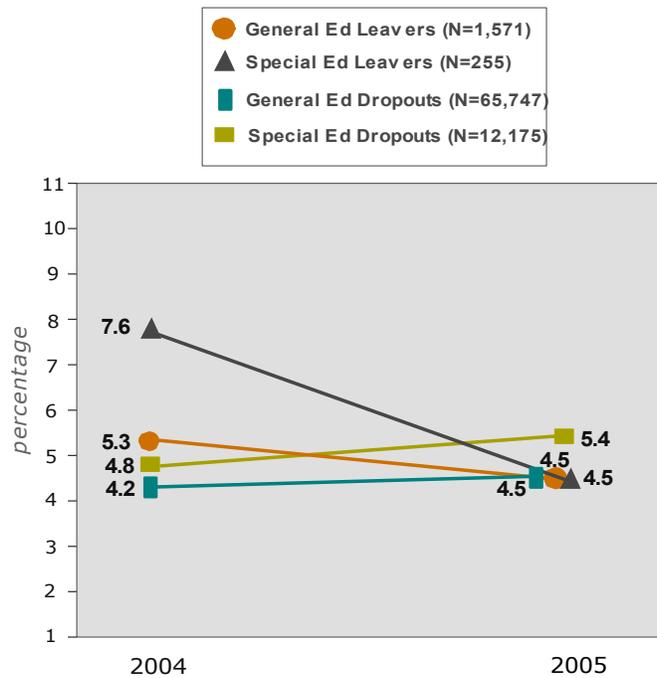


Figure 5. Change in the Percentage of CTE Leavers and Dropouts by Pupil Type



- In 2004-05, *one-third fewer* Hispanic students left CTE programs than did their counterparts in the dropout population (2.4% vs. 8.6%).
- Similarly, *less than half* as many African American students withdrew from CTE programs than from high school in 2004-05 (3.5% vs. 7.5%).
- The special education CTE leaver rate had dropped from 7.6% in 2003-04 to 4.5% in 2004-05, a decrease of 3.1%. On the other hand, the dropout rate for these students had increased by 0.6% across the two years.

To what can we attribute these trends? Were there features in CTE approved programs that propelled students toward program completion? MAGI's CTE evaluation studies conducted in the previous two years provided ample evidence about CTE curricular quality and student outcomes. The downward trend in the CTE leaver rate noted above was consistent with our finding that CTE curricula had improved over the same period. More students were graduating with Regents diplomas than before, a finding that is echoed in the research literature. In a

comparative study of 19 industrialized nations, Bishop and Mane (2004) found that offering students a robust career-tech option increased upper-secondary enrollment and completion rates. Similarly, in another study, CTE students with special needs were more likely to graduate from high school, to be employed in higher-paying trades, or to enroll in higher education (Harvey, 2002). Taken together, these findings suggest that CTE helps many students persist to graduation, resonating as a *meaningful* exit pathway.



## Chapter Four

### *The Impact of CTE on High School Outcomes*

#### *What is the impact of CTE programs on high school student attitudes and outcomes?*

In our previous studies, we examined the student impact of New York State’s CTE programs in a descriptive fashion, i.e., by reporting trends in student (a) enrollment, and (b) outcome categories across CTE program areas and for different student populations. Appreciable gains in both areas were noted. However, these approaches did not address the more substantive question, as to whether being enrolled in a CTE program had an influence on students’ perceptions about high school and future plans, and their academic achievement. There has been considerable interest in exploring this relationship in the CTE research literature (Hochlander, 2006; Silverberg, Warner, Fong & Goodwin, 2004). According to these studies, CTE concentrators do no better and no worse than their comparison group in academic achievement. How would New York’s CTE programs measure up in this regard? We turned our attention to this question in our third and final evaluation study.



#### **Method**

##### **(a) Sample selection**

A total of nine CTE sites were selected. These were stratified by region: two in New York City, one each in the Big Three Cities (Buffalo, Rochester, and Yonkers), and four in the rest of the state (two in small cities and two in rural regions). Among these latter four sites, district-based and BOCES-based CTE sites were equally represented.

Guidance staff at all nine sites were instructed to randomly select 10 seniors, drawn from CTE approved programs<sup>7</sup>. Each senior CTE student was matched with a non-CTE senior student<sup>8</sup> on age, gender, race,

<sup>7</sup> Parent permission letters were distributed and collected on all selected students. In addition, guidance staff and students were issued incentives for participation.

socioeconomic status (free/reduced lunch status), and GPA (grade point average)<sup>9</sup>. Guidance staff also supplied us with Regents examination scores for these students in English Language Arts (ELA) and mathematics. In all, we secured matched data for 150 students, i.e., 75 pairs. From this pool, we selected 50 pairs of CTE and non-CTE students to participate in telephone surveys, and used the remaining students to replace those from the original sample who were unable to complete the interviews.

### **(b) Telephone surveys**

Participating students responded to a 20-minute telephone survey that incorporated questions about their high school experiences, skill development, clarity of future goals, and the extent to which their high school had prepared them for their futures. A total of 107 surveys were completed.

### **(c) Determining group comparability**

To verify that the CTE and non-CTE students were successfully matched, we ran statistical tests of difference (chi-squares and t-tests) on their demographic characteristics and GPA. No significant differences emerged, confirming that our method for matching had been reliable.

## ***Key Findings***

In this section, we discuss CTE and non-CTE commonalities and differences in two areas: (a) attitudes towards school and (b) student achievement. In the first, we address how students perceived their high school experiences and how these shaped their future plans. In the second part, we examine how students in both groups fared on ELA and mathematics Regents assessments and the degree to which CTE membership played a role in their achievement.

### **(a) Attitudes towards School and Future**

By and large, CTE and non-CTE students shared many attitudes and perceptions about their high school experience.

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<sup>8</sup> A non-CTE student was one who was in a regular high school academic program.

<sup>9</sup> Students with a wide range of GPAs were selected: from a low of 1.9 to a high of 4.0



**There were no significant differences between CTE and non-CTE students' perceptions about their school performance and level of engagement.**

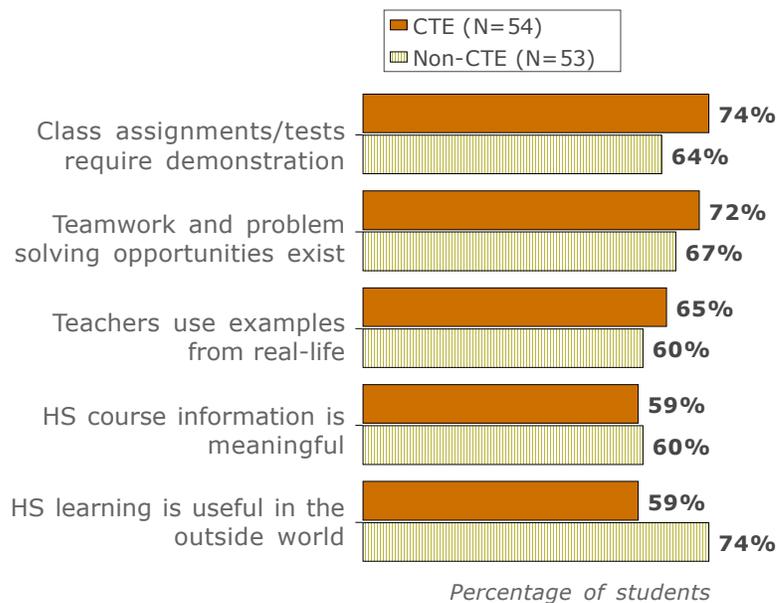
Both CTE and non-CTE students,

- reported receiving mostly B's in their classes,
- spent about three hours a night on homework, and
- had missed three or four days of school in the last month.



**Both groups of students concurred that they had participated in worthwhile high school experiences.**

**Figure 6. Frequency of CTE and Non-CTE High School Experiences (percentage reporting "always" and "most of the time")**



- There were no significant differences between CTE and non-CTE students: over two-thirds of students in both groups felt that their high school learning had merit, was useful, and applied to the real world.



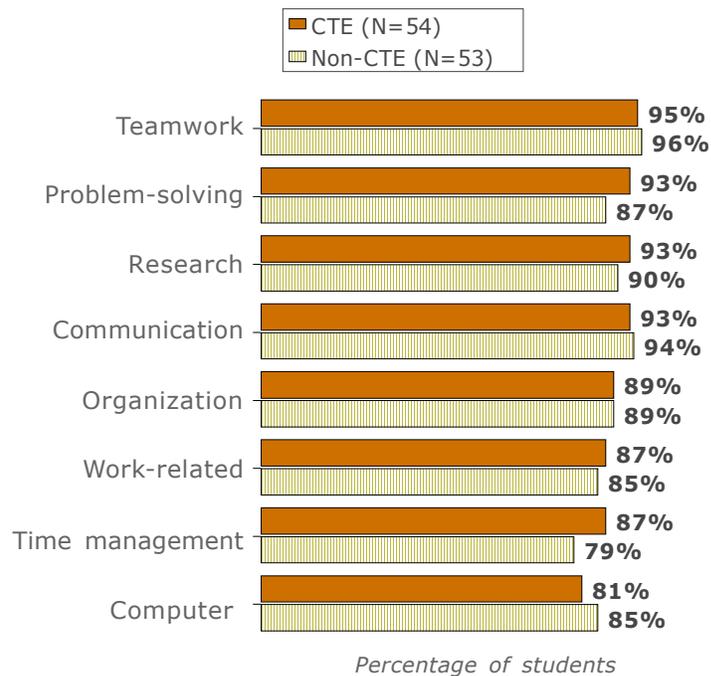
**Again, there were no significant differences between CTE and non-CTE students in their exposure to work-based learning.**

- About 25% of both CTE and non-CTE students had participated in one or more of the following school-sponsored work experiences: operating a school business on campus, a job shadow, and an internship.



**CTE students and their non-CTE peers were in agreement that their respective high school experiences had positively shaped their skills.**

**Figure 7. Extent to which High School influences Skill Development for CTE and Non-CTE Students (percentage responding "great extent" and "moderate extent")**



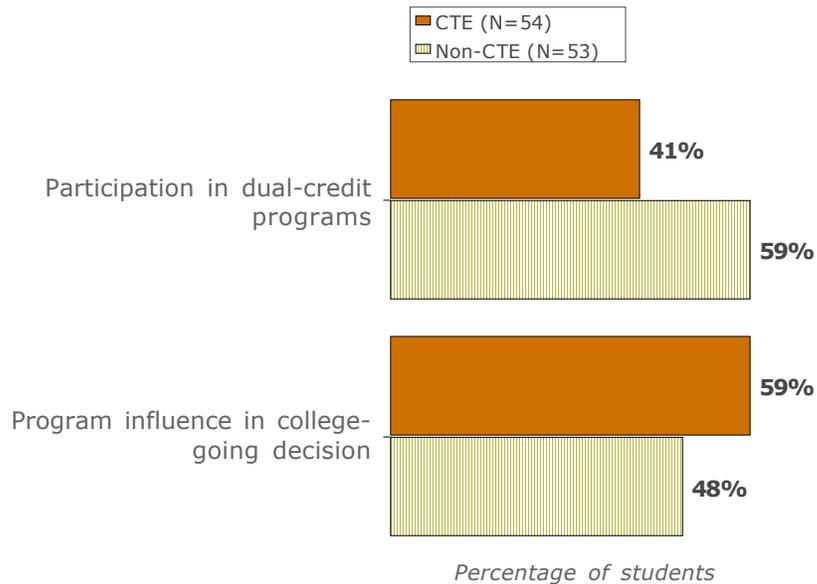
*“My school and high school experience is the best!”*  
*CTE student*

- CTE and non-CTE students responded in much the same way. Over 75% of students in both groups felt that they had learned many important skills at school: organization, teamwork, communication, problem-solving, time management, research, and computer skills.



## Dual-credit programs had a greater impact on CTE students' decisions to attend college.

Figure 8. Dual-Credit Program Participation and Influence on College Attendance for CTE and Non-CTE Students



- While proportionately more non-CTE students (59%) had enrolled in dual credit programs than their CTE counterparts (41%), it was the latter group who was more influenced by that experience to go on to college (59% vs. 48%).

What could account for this difference? According to researchers in the CTE arena, the answer may lie with the nature of CTE dual credit courses. CTE programs typically offer dual credit through courses that are articulated with technical colleges. Articulated courses are part of a sequence that is completed in the credit-awarding institution, whereas dual credit courses in an academic pathway are “stand-alone” courses. Therefore, it is likely that CTE students are encouraged to enter the college because of the credits “in escrow” that await them.



### There was little to no difference in CTE and non-CTE students' short-term plans.

Specifically,

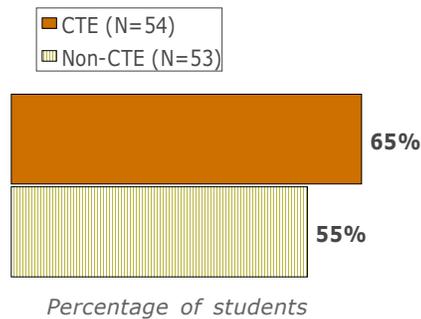
- all students were interested in further education, and both groups aspired to attend a 4-year college.
- they intended to work part-time while in college.
- neither group was interested in joining the military.

While CTE and non-CTE students responded similarly in terms of their readiness for the future, a few non-significant differences suggested a trend in favor of CTE students.



### More CTE students received help in planning their futures than did their non-CTE peers.

Figure 9. CTE and Non-CTE Students who Received College/Career Information (percentage reporting "adequate" and "mostly adequate")

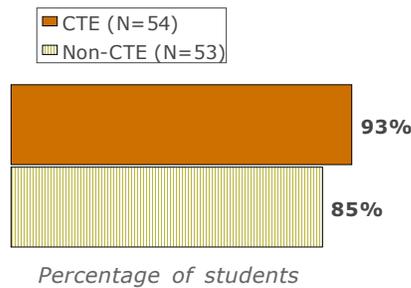


- Among CTE seniors, 65% indicated that they had gained most of the necessary information to prepare for life after school; about 55% of their comparison group felt the same.



## CTE students were more certain of their future plans.

Figure 10. CTE and Non-CTE Students' Certainty of Future Plans (percentage responding "very sure" and "fairly sure")

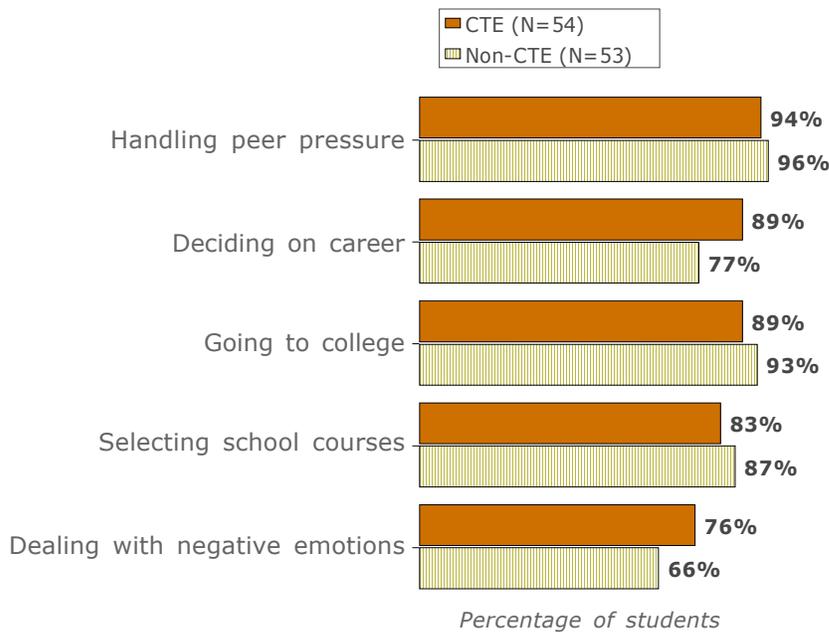


- A large proportion of CTE and non-CTE students claimed that they were sure of their plans after graduation, but 8% more CTE students expressed this belief.



## More CTE students had clarity in career direction.

Figure 11. CTE and Non-CTE Students' Confidence in Decision Making (percentage reporting "very confident" and "fairly confident")



- A greater proportion of CTE students (89%) felt confident in their career choices than their non-CTE classmates (77%).

Finally, we wanted to know if the high school experience was differentially valuable for subsets of the CTE and non-CTE samples. We created a *high school relevance* variable, by combining several survey items that measured skill development, effectiveness of high school preparation, the connection between coursework and future job plans, and the adequacy of college/career information. We then compared CTE and non-CTE students—disaggregated by race, gender, and GPA (above and below 3.0)—on high school relevance.



**CTE appeared to significantly enhance the high school experience for minority students.**

- Significantly more minority students in the CTE sample saw high school as relevant to their future than did their counterparts in the non-CTE group ( $p < .05$ ).

Qualitative analyses of individual student commentaries revealed several suggestions to improve high school programs. Again, CTE and non-CTE seniors expressed similar sentiments.



**The high school learning environment should better prepare students for independence.**

- Both groups felt that that students should be held more accountable. “Put more responsibility on us. Teachers could teach us better work habits. They are very lenient with students about handing in work late. They should take off points if assignments are late similar to college.”
- CTE students suggested opportunities for leadership training, and social skills development, especially in the areas of problem-solving and conflict resolution.
- All students felt the need to learn better time management skills.



## **Teachers should be more engaged with their subjects and with students.**

- Respondents indicated that some of their instructors needed to be more involved with the curriculum and teach in a more stimulating manner. “Teachers should take more pride in their work and make it more interesting—give us outside information that will help us for college—not just go straight to the text,” commented a student.
- They also reiterated that teachers needed to make students more responsible for their education. In the words of one, “ They should make us think for ourselves instead of always just giving us the answers. Teachers should make students work through problems more often than giving the easy way out.”
- Non-CTE students suggested that their instructors incorporate more authentic learning into their lectures. “Give us real-world examples of how and why this information is used.”



## **Guidance staff should expend more energy in college/career advisement.**

- Both groups felt that guidance departments should be more involved in personalizing assistance for college planning. “Guidance department needs to be a lot more organized and further their knowledge of elective courses,” said a student. In the words of another, “Have a class that helps students writing out college applications and financial aid applications—they can be very tricky.”



### **Greater rigor was needed in the high school curriculum.**

- All seniors, CTE and non-CTE expressed the desire to take more challenging courses, those that would prepare them for the rigor of college, as well as those that could clarify career goals. Dual-credit, Advanced Placement, and more specialized electives were strongly recommended. “They should push you to take more courses.” CTE students in particular, wanted more in-depth treatment and a greater variety within their areas of specialization. “I’d like to have had more business and fashion design classes,” reflected a senior.



### **According to non-CTE students, high schools should provide more opportunities for career exploration.**

- Not surprisingly, non-CTE students suggested that there be more internships and a greater variety of “non-academic” courses to take as electives. “A career program/internship—because I am interested in medicine and it could have been helpful to be exposed to a hospital.”

Collectively, what do these findings tell us about the high school perceptions of CTE and non-CTE seniors? Firstly, there were few, if any, significant differences between the attitudes of students in both groups, which ran contrary to what the research tells us. Students held generally favorable opinions about their respective high school programs. Secondly, where small differences emerged, these favored CTE students. More CTE students were influenced by dual-credit programs to attend college, had gained adequate college/career information, had greater clarity of future goals, and were more confident in their career choices. Thirdly, the high school experience was significantly more relevant for minority students in CTE programs than in non-CTE programs. This last

observation is consistent with our reciprocal finding on CTE leaver and dropout rates (see Chapter Three). Specifically, far fewer Hispanic and African-American students withdrew from CTE programs in the 2003-04 and 2004-05 years than from high school in general. If CTE contributed to their perception of high school relevance, then they were more likely to persist to graduation.

### **(b) Student Achievement**

We analyzed CTE and non-CTE group differences in ELA and mathematics achievement on the 2006 NYS Regents examination.



**Overall, there were no significant differences between CTE and non-CTE students in ELA and mathematics achievement.**

- As a group, both sets of students performed comparably, scoring between 77% and 80% on the ELA and mathematics Regents exams.

When disaggregated by GPA (above and below 3.0) and passing rates (above and below 65%), the same results accrued—CTE and non-CTE students did not perform in a significantly different manner. However, in one comparison, a significant difference emerged.



**Female students in the non-CTE group performed significantly better on the ELA exam.**

- Female non-CTE students achieved higher scores than their CTE peers on the ELA Regents exam—84% vs. 79%—a finding that was statistically significant ( $p < .05$ ).

Two conclusions emerge from these findings. The first and more obvious is that being in a CTE program did not produce an academic advantage. But the second conclusion we can draw is that students in CTE programs did *as well as* their peers in non-CTE/academic programs on the NYS exit exams. This is particularly noteworthy given that students in a CTE pathway take courses over and above academic requirements. These technical programs did not detract from or impede their academic achievement, a notion that is often speculated in the educational community.

## Chapter Five

### **Conclusions**

The following conclusions round out our three-year effort to evaluate New York State’s CTE programs.

#### **1. There was commencement-level academic content in most CTE curricula. Still, improvement is warranted.**

Independent review of a sample of CTE curricula showed that by and large, they represented a level of rigor that was commensurate with the NYS Learning Standards. The ELA and mathematics content were embedded in authentic learning experiences that challenged students to engage in critical thinking, involving complex application of language and quantitative skills. Yet there was also a small proportion of CTE curricula that needed enhancement—such as opportunities for more abstract learning.

#### **2. The CTE leaver rate was on a downward trend, while the high school dropout rate was on the rise.**

Over a two-year period, the proportion of CTE non-completers had declined, but the high school dropout rate had increased. These trends also held true for gender, race, and special education status and were consistent with earlier findings: from our previous evaluations of the CTE initiative we know that the quality of CTE curricula had improved, and more students in CTE programs graduated with Regents diplomas.

#### **3. CTE and their non-CTE peers shared similar views about their high schools.**

Contrary to prior research, there were little to no significant differences between the high school perceptions of CTE and non-CTE students. Overall, both groups of students were satisfied with their high school programs and intended to go to college. However, slightly



more CTE students expressed clarity of future goals and certainty about their career choices.

**4. Significantly more minority students in CTE programs than in non-CTE programs felt that high school was a relevant and meaningful experience.**

More African-American and Hispanic students in CTE programs rated their high school experience as relevant to their lives, than did their peers in non-CTE programs. We also found that fewer minority students withdrew from CTE programs than from high school in general. If the CTE experience contributed to their perception of high school relevance, then it appears that they were more likely to persist to graduation.

**5. Students in CTE programs performed as well as non-CTE students on measures of academic achievement.**

There were no significant differences between the groups, indicating that CTE membership did not detract from academic achievement. Put differently, CTE students did academically no better or no worse than non-CTE students—a finding that is in keeping with earlier research (Hochlander, 2006).

In conclusion, our findings provide credible support for the continued development and enhancement of statewide approved CTE programs. Students in these programs are for the most part, offered curricula that are characterized by rigorous standards. Not only do students perform academically at par with their classmates in non-CTE programs, but they also derive additional value: a more relevant high school experience, and greater readiness to chart their future. For many students, in particular an increasing number of minority students, CTE may well be the gateway to college and career success. While our study did not follow students into their postsecondary status, there is established evidence that CTE positively influences career experience for both students who enter the workforce right out of high school and those who work while going to college (Silverberg, Warner, Fong & Goodwin, 2004; Westchester Institute for Human Services Research, 1998). High schools, and especially those in need of improvement should strongly consider expanding the reach of approved CTE programs, because the CTE initiative has shown its capacity to benefit all students.



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