



Rapid Response—Career And Technical Education

Date	August 1, 2008
Number	00067
Request	<p>A state department of education (SDE) served by the Southeast Comprehensive Center has requested that the SECC identify successful U.S. high schools that focus more on technical rather than traditional academic subjects. Also, the SDE would like information on the following:</p> <ol style="list-style-type: none"> 1) Do these schools require Carnegie units? How are technical courses coded if Carnegie units are awarded? 2) How is credit given for technical job-training classes? 3) What types of terminal degrees are offered at these schools?
Summary	<p>In response to this request, the Southeast Comprehensive Center (SECC) reviewed information from a number of organizations including the American Diploma Project, American Youth Policy Forum, Association for Career and Technical Education, National High School Center, NGA Center for Best Practices, REL Southeast, Southern Regional Education Board (SREB), and the U.S. Department of Education. In addition, SECC used various Web search engines to locate information on the topic. The results are provided below.</p>

INTRODUCTION

Improving high school graduation rates is a crucial issue for states, schools, and districts nationwide. Under the No Child Left Behind Act of 2001 (NCLB), student achievement is the primary indicator of performance; on the secondary level, the high school graduation rate is an additional indicator. Unfortunately, U.S. schools are facing a number of challenges including an increasing dropout rate and an increasing number of high school graduates who are unprepared to transition to college or succeed in the workplace. At least 25% of students do not graduate, and many offer school-related reasons for dropping out, such as lack of motivation, boredom, and unchallenging environment, and an overall lack of engagement (Kennelly & Monrad, 2007).

Career and technical education (CTE) may prove beneficial to address these challenges related to students’ dropping out. Career and technical education refers to a combination of applied teaching strategies, curricula, and coursework that allows students to master academic content and gain practical experience in job-related skills.

The Carl D. Perkins Career and Technical Education Improvement Act (Perkins Act) provides a federal funding stream for CTE programs and requires participating states to create and recognize a series of new CTE offerings called “CTE Programs of Study,” which offer a blend of CTE and academic courses. These states are held accountable for the achievement of individual students based on a series of performance indicators. In addition, the law requires measurements for technical skill attainment (Meeder, 2008).

Many organizations support a renewed focus on CTE and stress its importance in effective high school redesign initiatives. In a recent report on CTE studies, Bottoms & Young (2008, p. 3) wrote that

Career/technical studies have a unique ability to teach rigorous academics in the context of real-world problems, projects and activities and give students in-depth experiences for academic and technical learning. CTE can develop students’ abilities both to acquire knowledge and skills and apply what they learn to authentic tasks. For many students, this builds deeper understanding of scientific, technical and mathematics concepts and a greater ability to comprehend and use language.

In its 2006 position paper on reinventing the American high school, the Association for Career and Technical Education (ACTE) stated the following:

We strongly believe that CTE courses and instructional methodologies have an important place in the redesigned high school of the 21st century. In our view, there should no longer be an artificial split between academic coursework and CTE studies, nor should exposure to career- or interest-based coursework be delayed until late in high school or college. Rather, we believe that all coursework, with clearly articulated standards and expectations, can help build in students the mix of skills, aptitudes and attitudes they will need for success after high school (ACTE, 2006, p. 4).

Upon review of the information collected for this report, SECC has identified a few technical high school models as well as states and school districts that have implemented CTE approaches. In addition, SECC has compiled information on CTE course credit and terminal degrees for dual enrollment programs. A summary of this information is provided below.

CTE COURSE CREDIT AND TERMINAL DEGREES

Overall, most of the CTE approaches reviewed did not indicate whether Carnegie units are used for awarding course credit. However, they did indicate whether joint or dual credit is granted to students for completing college coursework while enrolled in high school. According to the Association for Supervision and Curriculum Development, the Carnegie unit (CU) is a measurement used in most high schools to determine how much coursework a student has completed. Students generally need at least 20 Carnegie units to graduate; one unit equals a 50-minute class taken five times a week during the school year. A one-semester course is worth one-half of a Carnegie unit (ASCD, 2008). The Common Data Set Initiative (2001), defined a credit hour as “a unit of measure representing an hour (50 minutes) of instruction over a 15-week period in a semester or trimester system or a 10-week period in a quarter system. It is applied toward the total number of hours needed for completing the requirements of a degree, diploma, certificate, or other formal award.”

In addition to varying methods of awarding credit, high school graduation requirements vary from state to state and are governed by state policies. A description of state policies regarding high school graduation requirements is provided in the 2007 SREB report titled, *High Schools to College and Careers: Aligning State Policies*. The report provides a one-page summary for each state that includes the state’s policies, programs, and requirements for high school completion and college readiness, as well as CTE requirements. This report indicates that half of the SREB states require career courses for high school students beyond the core courses. In addition, “four states—Arkansas, Delaware, Maryland, and West Virginia—require all students to complete a concentration of courses in a career field.”

TECHNICAL HIGH SCHOOLS AND MODELS

To obtain information on this topic, SECC contacted both the National High School Center (NHSC) and REL Southeast. The NHSC indicates that it does not conduct research, so it could not provide information on whether individual high schools have been successful or unsuccessful in their technical education efforts nor was it aware of a single resource that surveys schools across the country. However, NHSC did provide a number of resources that were beneficial in developing this report (M. O’Cummings, personal communication, May 27, 2008). REL Southeast was unable to find a listing of successful U.S. high schools that focus on technical subjects. However, it did provide information on several technical systems and schools—Connecticut Technical High School System, Greater Lowell Technical High School, and Sussex Technical School District—which is summarized below (K. Lewis, personal communication, June 24, 2008):

Connecticut Technical High School System

Connecticut Technical High School System is a statewide system of 17 technical high schools and one technical education center. The curriculum is college preparatory, and each student enrolled receives instruction in one of 34 trade subjects from six clusters of study. The clusters are 1) retail, hospitality, and tourism, 2) construction, 3) manufacturing, 4) transportation, 5) computer technologies, and 6) health technology. Students may take various courses during 9th grade but must select a program path by the end of 9th grade. Each program meets the state’s graduation requirements and standards. Twenty-nine credits are required for graduation (three from the 9th-grade exploratory program, nine from the technical education career paths in grades 10th through 12th). For more information, access the system’s Web site at this link: <http://www.cttech.org>

Greater Lowell Technical High School

Greater Lowell Technical High School offers a full academic program in addition to 24 technical programs similar to those offered by the Connecticut system. The curriculum meets the learning standards of the Massachusetts curriculum framework. Students sample six programs from which they choose a focus area. Upon completion of a course of study, students receive a high school diploma and are prepared to take any state licensing examinations to be certified for employment in their respective focus areas. Although the school does not mention Carnegie units, its handbook states that in order to graduate, each student has to receive 400 hours of technical instruction each year in grades 10–12. For more information, refer to the school’s Web site at the following link: <http://www.gltech.org>

Sussex Technical School District

Students at schools in the Sussex Technical School District may sample six of the programs during 9th grade but must select a program by the end of the school term. Each program meets or exceeds Delaware’s standards, Carnegie unit coursework, and competence completion requirements. To qualify for graduation, students must have nine out of 28 credits in their technical program. Information on credit configurations, sample course studies, program configurations, and certifications is available on the district’s Web site at the following link: <http://www.sussexvt.k12.de.us/files/docs/POS.pdf>

Additional information on high schools that have implemented career and technical education approaches is provided in Table 1, which follows a summary of CTE approaches that were reviewed by SECC.

CTE INITIATIVES, MODELS, AND PROGRAMS

SECC reviewed a number of CTE initiatives, models, and programs that focus on improving student achievement. These included statewide initiatives as well as models and programs that were implemented in individual schools, multiple schools, or in school districts. Although there were differences in curriculums and practices, most of the CTE approaches reviewed generally focused on the following key issues:

- Collaborating with institutions of higher education to enable high school students to concurrently enroll in college and high school to attain college credit while still in high school
- Providing flexibility in how CTE courses are counted and ensuring that these courses are academically rigorous
- Using the relevancy of CTE coursework as a motivating factor for students to stay in school and graduate with marketable skills who otherwise would probably drop out

For example, several states—Arizona, Kentucky, and California—have implemented statewide initiatives for academic and CTE integration, with positive results. According to the Career and Technical Education 2004 Data Snapshot, compiled by the Career and Technical Division of the Arizona Department of Education, CTE high school graduates who took two or more Carnegie Units in an occupational program area outperformed the general high school student population taking all three of Arizona’s high-stakes academic tests known as AIMS, Arizona’s Instrument to Measure Standards (Reese, 2004). In its 2006 position paper on reinventing the American high school, the Association for Career and Technical Education (ACTE) stated that Kentucky has developed 10 interdisciplinary courses that allow students to meet requirements for academic courses by taking classes that carefully merge academic standards with career-oriented content. Students may also receive college credit for those classes through a dual-credit agreement with the Kentucky Community and Technical College System.

In California, the state’s Regional Occupational Courses/Programs (ROC/Ps) serve more than a million students. The primary purpose of the ROC/Ps is to provide career preparation that includes both the technical skills and related academic preparation required for meeting statewide standards that enable students to be employed in upwardly mobile careers and successfully continue on to postsecondary education. By state law, ROC/Ps must offer courses that are based on actual labor market demand. More than 18,000 businesses and industry representatives are involved in the development and monitoring of ROC/P curriculum in California, and more than 35,000 businesses throughout California offer internships to students (Adler, 2007).

Other states, such as Mississippi, are in the process of implementing initiatives for CTE that focus on academic rigor as well as college and workplace readiness. The Mississippi Department of Education (MDE) is implementing a three-phase redesign plan that focuses on workforce education and includes coaching and preparation of students to select a career path by the 10th grade. Phases two and three of the plan focus on an initiative entitled the Mississippi Career Pathways Model. The model targets students in grades 10 through 12 and will offer the following career pathways for the 2008–09 school year: agricultural sciences, allied health, automotive service, construction, culinary arts, education, management, manufacturing, and marketing and economics. The curriculum for career pathways has an increased focus on academic foundations, national knowledge and skills standards, related industry certifications, 21st century skills, and college readiness (MDE, 2007). Refer to Figure 1. Mississippi Career Pathways for additional information on the components of the model.



Figure 1. Mississippi Career Pathways Model

Reprinted with permission from the Mississippi State Department of Education.

In addition to the previously discussed initiatives, SECC reviewed a variety of approaches that focused on integrating academics with career and technical education. Based on this review, SECC identified several models and programs that use research-based practices for improving curricula, instruction, and student achievement; have been implemented in multiple sites; and have achieved success in one or more of the following key factors:

- Attendance rate
- Enrollment rate
- Drop-out rate
- Graduation rate
- Students' test scores or achievement levels
- Percentage of graduates enrolling in college
- School ranking or label

The models and programs that are highlighted below are the 1) Career Academy Model, the 2) High Schools That Work Model, the 3) Multiple Pathways Model, the 4) Project Lead The Way Program, the 5) Talent Development High School Model, and 6) Tech Prep Programs. A description of each is provided along with the methods by which course credit and degrees are awarded, if the information was available.

Career Academy Model

The Career Academy Model aims to keep students engaged in school and to prepare them for postsecondary education and employment. According to MDRC (a nonprofit education and social policy research organization), a Career Academy usually serves from 150 to 200 high school students from 9th or 10th through 12th grade. Career Academies are usually organized as small learning communities that combine academic and technical curriculums around a career theme and develop partnerships with local employers to provide work-based learning opportunities. Career themes include health, business and finance, and computer technology.

Since 1993, MDRC has conducted an evaluation of the Career Academy Approach, which included a diverse group of nine high schools across the United States. Results of the study showed that the Career Academies “substantially influenced the ability of students to improve their labor market prospects and sustain their engagement in postsecondary education programs in the 4 years following graduation” (Kemple & Scott-Clayton, 2004, p. 1). MDRC also indicated in its findings that, “Among students at high risk of school failure, Career Academies significantly cut dropout rates and increased attendance rates, credits earned toward graduation, and preparation for postsecondary education” (Kemple & Snipes, 2000, p. 7).

Research shows that Career Academies may provide former students with economic benefits as well. According to an *Education Week* article, in a report released on June 30, 2008, MDRC indicated that Career Academy graduates earned more money 8 years out of high school than those students who did not attend academies (Viadero, 2008). Researchers indicated that academy graduates earned on average an extra \$2,088 a year. In addition, the article stated that, “In keeping with previous studies, the MDRC researchers found that, by the time the academy students reached 12th grade, they had gained an academic edge over nonacademy students. Compared with their control-group peers, academy students were more likely to have stayed in school, to have better attendance records, and to be earning more credits toward graduation. The effect was especially strong among students considered to be at highest risk for dropping out of school.”

High Schools That Work Model

The High Schools That Work Model (HSTW) is a school improvement initiative that focuses on several key practices, which include motivating students to meet high expectations, requiring each student to complete an upgraded academic core and a concentration, teaching students the essential concepts of the college-preparatory curriculum, and providing students access to challenging career/technical studies in high-demand fields. The model also details key conditions for accelerating student achievement, which include teachers, schools, districts, and leaders working together to align policies, resources, initiatives, and accountability efforts to support schools as they implement school improvement designs (SREB, 2005).

The key component in the HSTW model is the recommended curriculum that requires each student to take the following:

-
- Four or more English courses
- Four or more credits in mathematics, including Algebra I, geometry, Algebra II, and a fourth higher-level mathematics course
- At least three college-preparatory science courses
- At least three college-preparatory social science courses that emphasize reading and writing to learn
- One or more computer courses, with demonstrated proficiency in computer technology
- A minimum of four credits in a CTE concentration

According to the Southern Regional Education Board (SREB), which coordinates HSTW, over 1,000 high schools and 225 middle schools participate in the program. Schools participating in the program have experienced improvements in student achievement as well as the percentage of graduates going on to postsecondary education. For example, after 3 years of using the HSTW model, the Wayne Local Schools District in Ohio improved its state ranking from “continuous improvement” to “excellent.” Garden City High School in Kansas saw its dropout rate fall from 15% in 1993–94 to 3.4% in 2003–04, and attendance rose from 89% to 96%. In 2004, 83% of the students at Swain County High School (North Carolina) completed either a college-technical prep or college-prep curriculum. After following the HSTW practices and making tremendous progress, Los Fresnos High School in Texas was selected by the ED as a New American High School (SREB, 2000). Case studies on these high schools and others that are using the HSTW model are available at the following link:

<http://www.sreb.org/programs/hstw/publications/PubsDisplay.asp?SubSectionID=19>

Multiple Pathways Model

The Multiple Pathways Model offers students a variety of high school programs that provide both the academic and career foundations needed for college and workplace readiness. Key features of the model include the following (Oakes & Saunders, 2007):

- Learning in multiple settings (smaller schools or learning communities, community and 4-year colleges, and “off campus” learning settings, such as apprenticeships and other work-based learning experiences)
- Restructured coursework (programs of study, term or senior projects, internships)
- Flexible times (school day, school year, dual enrollment) and support (targeted compensatory, remedial, and retention strategies)
- Integrated curriculum that focuses on the knowledge and skills required in the workplace

Several cities and states—including Boston, New York City, Arkansas, California, Pennsylvania, North Carolina, Texas, and Virginia—have implemented Multiple Pathways policies and initiatives in their school districts. For example, Arkansas has 14 college campuses that offer half-day CTE for high school students. Pennsylvania’s Education Project 720 provides funding and technical assistance to school districts for developing rigorous college and career prep curricula. Through this program, Pennsylvania hopes to increase its graduation rates and rates of students going to college. The Texas High School Project focuses on ensuring that students in the state leave high school prepared for college and careers. State initiatives in the Texas model are early- and middle-college programs, dropout prevention programs, and school-wide reform activities.

According to Oakes and Saunders (2007), scholars that were included in their collection of papers on the Multiple Pathways model in California indicated that this model could impact learning, high school graduation rates, access to higher education, and help the state to address its workforce needs. In 2005, the New York City Department of Education implemented the Office of Multiple Pathways to Graduation to study the needs of the overage and under-credited high school population and to develop a comprehensive plan to meet these needs. The department’s plan, entitled Multiple Pathways, is a portfolio of school and program models that includes Transfer High Schools, Young Adult Borough Centers, full- and part-time GED programs, and Learning to Work services (New York Department of Education, 2005).

Project Lead The Way® Program

Project Lead The Way (PLTW) is a national, nonprofit educational program that helps to provide middle and high school students with the rigorous educational foundation needed to develop strong backgrounds in science and engineering. Currently, 49 states and the District of Columbia have PLTW programs, which have been implemented in 2,000 schools nationwide (PLTW, 2008).

The PLTW curriculum includes the following 1) engineering courses organized around problem-centered projects that require students to apply mathematics, science, and technical knowledge and skills; 2) mathematics and science courses, 3) a training session for educators teaching PLTW courses, and 4) a national end-of-course exam to determine whether or not students meet the course objectives and performance outcomes (Bottoms & Uhn, 2007).

SECC was unable to find data on individual schools using the PLTW program but did locate research findings on PLTW students (see below).

In their research brief on PLTW, Bottoms and Uhn reported the following key findings:

- PLTW students achieved significantly higher scores in mathematics and science on the NAEP-referenced HSTW Assessment than similar HSTW career/technical students in comparable career technical (CT) fields and in all CT fields
- PLTW students were more likely to complete at least 4 years of mathematics, to complete all parts of the HSTW-recommended curriculum, and to use academic knowledge and skills to complete assignments in their career/technical courses

In addition, the NGA Center for Best Practices (2007, p. 7), said that, “Research shows that PLTW students are more likely to persist in engineering and related fields in college. As of 2005, 80% of graduates went on to college; of these 68% majored in engineering.”

Talent Development High School Model

The Talent Development High School Model, developed by the Center for Research on the Education of Students at Risk (CRESPAR) at John Hopkins University, focuses on helping students to successfully transition from middle school to high school and to then go on to graduate from high school. The model has five main features (MDRC, 2008):

- Small learning communities
- Curricula that lead to advanced English and mathematics coursework
- Academic extra-help sessions, that include “catch-up” reading and math courses for 9th graders
- Staff professional development strategies
- Parent and community involvement activities to foster students’ career and college development

In 2005, the MDRC released a report on a 4-year study that it conducted of the Talent Development High School Model as implemented in the School District of Philadelphia. The researchers indicated that the study used a combination of quasi-experimental evaluation methods, an interrupted time series analysis and a comparison schools technique. In the uninterrupted times series analysis, the researchers compared measures of student performance in schools that implemented the model with the performance of similar students in the *same* schools before implementation. They also conducted a second time series analysis for a group of comparison schools in the same district that had similar characteristics to the intervention schools.

In the 2003–04 school year, seven of the district’s 22 nonselective high schools were implementing the model; the report focused on the five schools that implemented the model first. Key findings of the study include that “Talent Development produced substantial gains in attendance, academic credits earned, and promotion rates during students’ first year of high school. The improvements in credits earned and promotion rates for 9th graders were sustained as students moved through high school” (Kemple, Herlihy, & Smith, 2005, p. ES-2). The authors stated that this model was used in over 80 schools and in 20 districts nationwide.

In a 2001–03 report on five Philadelphia schools using the Talent Development model, the Philadelphia Education Fund stated that, “Schools implementing the model for 2 or more years have seen their 9th grade attendance improve by 15 or more percentage points, while the number of students with 90 percent or more attendance has doubled.” The report also said that at Strawberry Mansion High School, which was once seen as one of the most troubled schools in the district, students achieved a notable 100-point gain in their state math PSSA scores in 2002.

In addition to the information above, SECC located a list of Talent Development High Schools on the John Hopkins University Web site (Center for Social Organization of Schools) but was unable to locate any research on the efficacy of this approach at these high schools. Refer to the following link to access this list: <http://www.csos.jhu.edu/tdhs/about/partners.asp>

Tech Prep Programs

According to the U.S. Department of Education (ED), Tech Prep is an important school-to-work transition strategy that helps students make the connection between school and employment. It allows students to earn credit for college courses while still attending high school. Students participating in Tech Prep programs receive dual credit, which is awarded in accordance with the policies at individual schools (ED, 2008).

Tech Prep programs are funded by the Perkins Act and are required to have seven elements:

1. An articulation agreement between secondary and postsecondary consortium participants
2. A two-plus-two or a four-plus-two design with a common core of proficiency in math, science, communication, and technology
3. A specifically developed Tech Prep curriculum
4. Joint in-service training of secondary and postsecondary teachers to implement the Tech Prep curriculum effectively
5. Training of counselors to recruit students and to ensure program completion and appropriate employment
6. Equal access for special populations to the full range of Tech Prep programs
7. Preparatory services

Student outcomes from participating in a Tech Prep program include an associate degree or a 2-year certificate; technical preparation in at least one field of engineering technology, applied science, mechanical, industrial, or practical art or trade, or agriculture, health, or business; competence in math, science, and communication; and increased employability. In addition to the outcomes detailed above, some schools participating in the program have experienced improvements in performance and achievement.

Decision-makers are cautioned to keep in mind that although specific schools or districts may have achieved positive results with implementation of a CTE model or program such as those discussed above, positive results will only be replicated if the model or program is implemented with fidelity as it was designed.

Refer to Table 1 for additional information on high schools that have successfully implemented CTE models and programs.

Table 1. Results of Implementation of Career and Technical Education Models and Programs

Type	School	Results
Career Academy Model	Health Careers Academy at Palmdale High School Palmdale, California	Implementation: 1991 Structure: Students attend 4-year program—integrated curriculum of English, mathematics, science, and a health career pathway; hands-on, work-based learning opportunities and integrated projects; juniors, seniors complete job shadowing at local hospitals and medical clinics Diploma: High school diploma Results: HCA sophomores passed the 2006 California High School Exit Exam at a higher rate and earned higher scores on the 2006 California Standards Tests in English, mathematics, science, and history than other Palmdale High School sophomores (American Youth Policy Forum, 2007). Link to school’s Web site: http://www.phsfalcons.org/programs/healthcareers.htm
	Health Careers Academy (HCA) (Housed on Northeastern University campus) Boston, Massachusetts	Implementation: 1995 Structure: College preparatory; students complete 4-year course sequence in mathematics, science, history and English; 3 years of foreign language, one foundation course in technology (Health Careers Academy, 2004). Diploma: High school diploma Results: Achieved 100%, 4-year high school graduation rate for class of 2006 (Boston Public Schools, 2008). Identified as meeting Adequate Yearly Progress for 2002–03 by the Massachusetts Department of Education. In 2003, 100% of HCA graduates applied to and were accepted by higher education institutions of their choice (Health Careers Academy, 2004). Link to school’s Web site: http://healthcareersacademy.org/HOME.html
High Schools That Work Model	Corbin High School Corbin, Kentucky	Implementation: 2004 Structure: High school integrated with area technology center. Career offerings—business, consumer science, administrative support services, manufacturing, childcare, financial services. Technical Center offerings—drafting, electrical, automotive, information technology, welding, health sciences, communication. Individual Graduation Plans are developed for each student to track academic needs and career goals.

Table 1. Results of Implementation of Career and Technical Education Models and Programs

Type	School	Results
High Schools That Work Model (cont.)		<p>Diploma/Degree: High school diploma and dual credit programs with Eastern Kentucky University, Laurel Technical College, Spencerian College, and Sullivan College.</p> <p>Results: According to the 2003–04 School Report Card (available on school’s Web site), Corbin students scored above the state average on state assessments, nationally normed tests, and the ACT/SAT (Gibbs, 2006). According to information on its Web site, Corbin High School was named one of 25 Model High Schools in the U.S. in 2006.</p> <p>Link to school’s Web site: www.corginschools.org</p>
	Henry W. Grady High School Atlanta, Georgia	<p>Implementation: 1998</p> <p>Structure: The school changed its graduation requirements to college-prep and career/technical prep formats to include additional units in American literature, mathematics, science, and career/technical studies. Also, the revised curriculum includes four credits in college-prep English/language arts; four credits of mathematics, including Algebra I and II, geometry, and a higher-level mathematics course; three credits in science, with at least two laboratory science courses at the college-prep level.</p> <p>Results: The school’s attendance rate increased from 83% in 1996 to 93% in 2002. The 9th grade retention rate (failure to be promoted to 10th grade) dropped from 35% in 1996 to 10% in 2003. The high school graduation rate for all students increased from 56% in 2001–02 to 89% in 2004–05. The percentage of Grady students entering public colleges in Georgia needing remediation decreased from 25% in 1998 to 18% in 2002 (HSTW, 2005).</p> <p>Link to school’s Web site: http://www.gradyhighschool.org/</p>
	Los Fresnos High School (LFHS) Los Fresnos, Texas	<p>Implementation: 1993</p> <p>Structure: Each student must complete an academic core and a concentration of 3.5 units in a career pathway. Graduation requirements were changed to include designations of Algebra I and II and geometry for the mathematics units; additional or new units were added in science, social studies, a language other than English, fine arts, technology application; and one broad concentration was required of mathematics or science, a career/technology area, or an academic area.</p> <p>Results: By the end of 1999–2000, the Texas Education Agency recognized LFHS as “exemplary.” The school’s attendance rate increased from 92% in 1993–94 to 96% in 1998–99. The percentage of CTE students planning to attend 4-year colleges</p>

Table 1. Results of Implementation of Career and Technical Education Models and Programs

Type	School	Results
<p>High Schools That Work Model (cont.)</p>		<p>increased from 40% in 1994 to 65% in 2000. Also in 2000, 71% of students qualified to be “Texas Scholars,” which required completion of requirements for all 2003 LFHS graduates (HSTW, 2000).</p> <p>Link to school’s Web site: http://www.lfcisd.net/losfresnoshs/site/default.asp</p>
<p>Tech Prep Program</p>	<p>GateWay Early College High School (Housed at GateWay Community College) Phoenix, Arizona</p>	<p>Implementation: 2004</p> <p>Structure: Students may begin taking college courses as early as the 9th grade and must focus their academic studies in one of five areas: automotive technology, hydrologic technology, practical nursing, web development, and network administration. Students also must complete courses in public speaking, personal finance, and service learning; in junior year, students must complete a service learning component</p> <p>Diploma/Degree: Students can earn a high school diploma and an associate’s degree</p> <p>Results: Increase in attendance from 64% to 94.5%, decrease in dropout rate from 30% to 12%, and a change in the school’s label from “performing” to “performing plus” (GateWay Community College, 2008)</p> <p>Link to school’s Web site: http://highschool.gatewaycc.edu/</p>

Notes: There are numerous CTE models and programs available. Those detailed above are a few of those that have implemented CTE approaches and for which data is available concerning the results of their efforts. SECC does not endorse any of the initiatives, models, or programs featured in this report.

REFERENCES

- Adler, L. (2007). ROP: Good news no matter what students plan for the future. *Leadership*. 37(1), p. 35.
- American Youth Policy Forum. (2007). *Forum brief: Exemplary career and technical education districts and programs*. Retrieved July 17, 2008, from <http://www.aypf.org/forumbriefs/2007/fb092107.htm>
- Association for Career and Technical Education. (2006). *Reinventing the American high school for the 21st century: A position paper*. Retrieved July 16, 2008, from http://www.acteonline.org/policy/legislative_issues/upload/ACTEHSReform_Full.pdf
- Association for Supervision and Curriculum Development. (2008). ASCD: For the Success of Each Learner. *A lexicon of learning: What educators mean when they say...* Retrieved August 1, 2008, from <http://www.ascd.org/portal/site/ascd/menuitem.5a47c86b3b7b44128716b710e3108a0c/template.article?articleMgmtId=fff4016620520010VgnVCM1000003d01a8c0RCRD>
- Boston Public Schools. Focus on Children. About the BPS. (2008). *Boston's Health Careers Academy graduates 100 percent of students in four years*. Retrieved July 16, 2008, from <http://boston.k12.ma.us/bps/news/news-2-2-07.asp>
- Bottoms, G., & Young, M. (2008). *Crafting a new vision for high school: How states can join academic and technical studies to promote more powerful learning*. Retrieved July 16, 2008, from http://www.sreb.org/publications/2008/08V07_Crafting_new_vision.pdf
- Cahill, M., Lynch, J., & Hamilton, L. (2006). *New York City DOE Multiple Pathways strategy summary findings*. Retrieved July 16, 2008, from http://www.ytfg.org/documents/Presentation_to_Regents_Broad_Distribution.pdf
- Common Data Set Initiative. (2001). *Common data set of U.S. higher education terminology*. Retrieved August 1, 2008, from <http://www.uta.fi/FAST/US5/REF/dataset.html#finalid>
- ConnectEd. (2008). The California Center for College and Career. *Model programs*. Retrieved July 16, 2008, from <http://www.connectedcalifornia.org/programs.php>
- GateWay Community College. (2008). *Early college high school: Tech prep*. Retrieved July 16, 2008, from <http://highschool.gatewaycc.edu/Information/TechPrep/Default.htm>
- Gibbs, H. (2006). Examining a high school that works: Kentucky's Corbin High School is one of the high schools that works as a 21st century school. *Techniques: Connecting Education & Careers*, 81(5), pp. 24–28.
- Health Careers Academy. (2004). *Health Careers Academy, a Horace Mann Charter School at Northeastern University: 2002–03 annual report*. Retrieved July 16, 2008, from <http://www.doe.mass.edu/charter/reports/2003/annual/0452.pdf>
- Kemple, J. (2004). *Career academies: Impacts on labor market outcomes and educational attainment*. Retrieved July 16, 2008, from <http://www.mdrc.org/publications/366/full.pdf>
- Kemple, J., Herlihy, C., & Smith, T. (2005). *Making progress toward graduation: Evidence from the Talent Development High School Model*. Retrieved July 16, 2008, from <http://www.mdrc.org/publications/408/full.pdf>
- Kemple, J. (2004). Overview. *Summary of career academies: Impacts on labor market outcomes and educational attainment*. Retrieved July 16, 2008, from <http://www.mdrc.org/publications/366/overview.html>
- Kennelly, L. & Monrad, M. (2007). *Approaches to dropout prevention: Heeding early warning signs with appropriate interventions*. Retrieved July 16, 2008, from http://www.betterhighschools.org/docs/NHSC_ApproachesToDropoutPrevention.pdf

- MDRC. (2008). *Career academies*. Retrieved July 16, 2008, from http://www.mdrc.org/project_29_1.html
- MDRC. (2008). *Talent development*. Retrieved July 16, 2008, from http://www.mdrc.org/project_29_17.html
- Meeder, H. (2008). *Policy Brief: The Perkins Act of 2006: Connecting career and technical education with the College and Career Readiness Agenda*. Retrieved July 16, 2008, from http://www.achieve.org/AchievePolicyBrief_Perkins
- Mississippi Department of Education. *Redesigning education for the 21st century workforce*. MDE Brief, Fall 2006, 1(1). Retrieved July 16, 2008, from http://www.mde.k12.ms.us/extrel/Redesign_Booklet.pdf
- New York City Department of Education. (2006). *Multiple Pathways research and development: summary findings and strategic solutions for overage, under-credited youth*. Retrieved July 16, 2008, from <http://www.ytfg.org/documents/OMPGOverviewandFindingsBroadDistribution102206.pdf>
- NGA Center for Best Practices. (2007). *Retooling career technical education*. Issue Brief. Retrieved July 16, 2008, from <http://www.nga.org/Files/pdf/0706TECHED.PDF>
- Oakes, J., & Saunders, M. (2007). *Multiple Pathways: High school reform that promises to prepare all students for college, career, and civic responsibility*. UCLA's Institute for Democracy, Education, & Access. *Multiple Perspectives on Multiple Pathways Series*. Paper mp-rr002-0207. Retrieved July 12, 2008, from <http://repositories.cdlib.org/idea/mp/mp-rr002-0207>
- Philadelphia Education Fund. (n.d.). *Year three of the Talent Development High School Initiative in Philadelphia: Results from five schools*. Retrieved July 16, 2008, from <http://www.philaedfund.org/pdfs/K-8%20Report.pdf>
- Project Lead the Way. (2008). About PLTW. Retrieved July 16, 2008, from <http://www.pltw.org/About/About-Us.cfm>
- Reese, S. (2006). Stating the case for CTE. *Techniques: Connecting Education & Careers*. 81(5), pp. 18–20.
- Southern Regional Educational Board. (2000). *High Schools That Work: Case study—Henry W. Grady High School*. Retrieved July 7, 2008, from http://www.sreb.org/programs/hstw/publications/case_studies/Grady.asp
- Southern Regional Educational Board. (2000). *High Schools That Work: Case study—Los Fresnos High School*. Retrieved July 7, 2008, from http://www.sreb.org/programs/hstw/publications/case_studies/Los_Fresnos.asp
- Southern Regional Educational Board. (2005). *High Schools That Work: An enhanced design to get all students to standards*. Retrieved July 16, 2008, from <http://www.sreb.org/programs/hstw/publications/2005Pubs/05V07AllStudentsToStandards.asp>
- Southern Regional Educational Board. (2007). *High school to college and careers: Aligning state policies*. A Focus Report in the Challenge to Lead Series. Retrieved July 16, 2008, from http://www.sreb.org/main/Goals/Publications/06E20_Aligning_2007.pdf
- Southern Regional Educational Board. (2008). *High Schools That Work: Case studies*. Retrieved July 16, 2008, from <http://www.sreb.org/programs/hstw/publications/PubsDisplay.asp?SubSectionID=19>
- Southern Regional Educational Board. (n.d.). *High Schools That Work: Facts about high school career/technical studies*. Retrieved July 7, 2008, from http://www.sreb.org/programs/hstw/career/Facts_About_HS_Career.pdf
- U.S. Department of Education. (2008). ED.gov. *Tech prep education*. Retrieved July 16, 2008, from <http://www.ed.gov/programs/techprep/index.html>
- Viadero, D. (2008). Career academies seen to pay off in higher earnings. *Education Week*. Retrieved July 24, 2008, from www.edweek.org/ew/articles/2008/07/16/43career.h27.html

RESOURCES

Kazis, R. (2005). *Double the numbers: A jobs for the future initiative*. Remaking career and technical education for the 21st century: *What role for high school programs?* Retrieved July 16, 2008, from http://eric.ed.gov:80/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/30/b1/d6.pdf

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). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved July 24, 2008, from <http://nces.ed.gov/pubs2008/2008035.pdf>

Southern Regional Educational Board. (2004). *Using rigor, relevance and relationships to improve student achievement: How some schools do it*. 2004 Outstanding Practices. Retrieved July 16, 2008, from http://www.sreb.org/programs/hstw/Outstanding/04V08_2004%20Outstanding%20Practices.pdf

Rapid Responses are customized reports that are prepared to fulfill requests for information by the departments of education of the states served by the Southeast Comprehensive Center at SEDL. The responses address topics on current education issues related to the requirements and implementation of the No Child Left Behind Act of 2001. For additional information, visit the SECC Web site at secc.sedl.org.

Wesley Hoover, PhD, SEDL President and CEO
 Robin Jarvis, PhD, SECC Program Manager
 Chris Times, MBA, SECC Communications Associate and Publication Editor

Rapid Response Team: Leslie Blair, Project Director; Philip Eaglin, Program Specialist; Erin McCann, Program Associate; Concepcion Molina, Program Associate; Chris Times, Communications Associate; and Ed Tobia, Program Associate.

Alabama State Liaison: Lou Meadows (lou.meadows@sedl.org)
 Georgia State Liaison: Glenda Copeland (glenda.copeland@sedl.org)
 Louisiana State Liaison: Darlene Brown (darlene.brown@sedl.org)
 Mississippi State Liaison: Debra Meibaum (debra.meibaum@sedl.org)
 South Carolina State Liaison: Sandra Lindsay (sandra.lindsay@sedl.org)

The Southeast Comprehensive Center is a project of SEDL
 SEDL Headquarters
 4700 Mueller Blvd.
 Austin, TX 78723
 800-476-6861
www.sedl.org

Southeast Comprehensive Center at SEDL
 3501 N. Causeway Blvd, Suite 700
 Metairie, LA 70002
 800-644-8671
secc.sedl.org

The contents of this publication were developed under a grant from the U.S. Department of Education (USDE). The contents do not, however, necessarily represent the policy of the USDE, and one should not assume endorsement by the federal government.