Learning to Work, Working to Learn, Transforming Career and Technical Education

The Report of the NASBE Study Group on Promoting Excellence in Career and Technical Education

October 2008
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NASBE would like to thank Crossland Construction for its support of the activities and report of the Study Group on Career and Technical Education. However, the recommendations and substance of this report reflect the collective thinking of the Study Group members and do not necessarily represent the views of Crossland Construction.
Career and technical education, or CTE, has its roots in vocational education programs that were traditionally skill-based and non-academic—shop, home economics, and cosmetology. But while vocational education trained students for jobs, CTE prepares students for careers. In recent years, CTE has morphed the traditional focus on technical skills for the non-college bound student into a 21st century version of workforce preparation—one that focuses on career and workplace skills as well as academic learning. On a broader scale, CTE is fast becoming an integral part of education reform discussions nationwide.

Several converging forces have thrust CTE into the limelight. Global competition is perhaps the strongest driving force, and one that industry is sure to continue to push as the economy of the “flat world” becomes more apparent with each year. Another major driver is the nation’s high dropout rate, especially for our most at-risk students. Policymakers can no longer deny that huge numbers of students quit high school and that band-aid solutions are no longer acceptable. The proven results of high-quality, relevant CTE have the potential to give our education system a much-needed roadmap as we wrestle with these challenging issues, pushing our policymakers, leaders, and educators toward a better approach to preparing students for work and life.

In 2008, the NASBE Board of Directors recognized this sense of urgency and charged state board members from across the country with examining the issue more closely. Understanding the critical place that CTE has in education reform, the Board urged members to join in learning about the role state boards of education can and should play in promoting career and technical education in state policymaking.

The members of the Study Group on Promoting Excellence in Career and Technical Education had two primary objectives. First, the group set out to identify and review the key components of CTE. The group’s second goal was to develop strategies for providing rigorous, meaningful CTE for the nation’s students. Over the course of the year, Study Group members met with education leaders who are delivering high-quality CTE, business leaders
who are helping to define the needs of today’s and tomorrow’s growth industries, and other experts with divergent perspectives on career education. Specific topics included:

- Teacher preparation and licensure;
- Rigorous and relevant curriculum and standards for CTE;
- Assessments for CTE coursework and evaluation of CTE programs;
- Industry certifications and school business partnerships;
- Alignment to high school redesign efforts;
- Introduction of CTE in middle schools;
- Seamless articulation between high school coursework and community college classes;
- Career clusters in CTE;
- Access to and expansion of CTE;
- Opportunities under the Carl D. Perkins Career and Technical Improvement Act to support programs that lead to industry certifications and higher education opportunities; and
- Educating parents and counselors on the value of CTE courses.

From these discussions, the Study Group developed the following set of recommendations for state boards of education to consider as they incorporate the role of CTE into their state’s overall vision and plan for education.

**Recommendation:** Provide meaningful opportunities for all students to engage in rigorous and relevant career and technical education, both at the high school level and in the middle grades. States should actively work to provide a range of experiences that expose students to career-related clusters, such as health, law, or the performing arts. This will allow students to focus on a particular career pathway or to explore courses across disciplines while simultaneously gaining a strong academic base. The goal is to provide exposure for students that gives them the opportunity to plan and to choose their own path in life, whether that choice is work after high school, a direct route to college, or maybe even work that’s followed by college at a later date. No student should be faced with roadblocks when it comes to their career and life aspirations, and learning should be both demanding and relevant for each individual student.

**Recommendation:** Engage industry and community leaders in meaningful partnerships. State boards of education and business leaders should join forces to drive an education agenda that will promote 21st century learning: learning that focuses on developing our nation’s workforce and its citizens. The days of business leaders writing blank checks to the education establishment are over. Industry wants a return on its investment, and that return is in the form of a well-prepared workforce.

State boards of education should support the convening of other state-level stakeholders, such as the chamber of commerce, the workforce development board, the legislature, the governor, other labor-related agencies, community college and higher education, P-20 councils, and industry leaders in an effort to connect economic and education issues.
**Recommendation:** Adopt policies to integrate CTE and academic coursework and standards, while providing multiple assessments to measure skill and knowledge attainment. Also, adopt policies to recognize students for career-focused learning. Many industries have developed standards and core competencies, often with the aid of an array of stakeholders, including educators. A number of industries have also developed curricular materials and they provide industry certification for skill attainment. These are all important tools and guidelines for states to adopt, though care must be taken to align career-focused standards with core academic requirements. This latter effort is no small task—it is critical that career standards align with academic subjects to ensure transitions beyond high school, especially in creating pathways for students interested in pursuing a four-year degree. What's more, providing assessments that measure not only knowledge, but skill and ability is an important measure for students as they move beyond their secondary education, either to acquire additional schooling or to enter a particular career.

**Recommendation:** Ensure seamless transitions for students from high school to postsecondary and beyond. This transition is one of the biggest hurdles for many students. State boards should work with other policymaking bodies throughout their state to ensure an easy-to-navigate transition of credits and skill attainment from high school to work and postsecondary education.

**Recommendation:** Develop policies to address quality, recruitment, and compensation for CTE instructors. Who teaches, when, and for what pay are perhaps the biggest questions facing policymakers and school administrators. There is no one answer, but it is clear that innovative, unconventional thinking is a necessity. Because the No Child Left Behind Act mandates highly qualified teachers for core academic subjects, states need to explore ways of incorporating skilled-trade experts into the classroom while continuing to provide high-quality instruction in core academics. State policymakers also need to address the challenge school leaders have in recruiting high-quality candidates for CTE teaching positions. Higher salaries offered by industry often trump those offered to educators.

**Recommendation:** Address the poor image of CTE with educators, parents, guidance counselors, and the public. Despite the shift from job-training in vocational education to career-training in CTE, there is still a stigma attached to the choice of being a CTE student. The new mantra of education reform is “college for all,” and CTE has not traditionally fit that mold. New changes to the Perkins Act, however, have cleared the roadblocks to linking academic coursework with career-focused learning, allowing high school students to both prepare for college and for careers. What is needed at this stage is an aggressive campaign to educate school administrators, teachers, guidance counselors, parents, and students about the promise of high-quality, rigorous CTE programs. Policymakers and business leaders will have to convince those with doubts that CTE is a viable option for preparing students for work and life.
Imagine walking into a classroom and finding a group of students huddled around a long table. There are no desks, no chalkboard at the head of the room, no teacher lecturing. Your entrance goes completely unnoticed. At first glance you wonder if you’re in the right place. You take a few steps closer to the long table to get a better look at what the students are doing. The classroom is buzzing with energy.

There are two teachers, one at each end of the long table. Some students are typing at laptop computers. Others read aloud from their notebooks to the group. In the middle of the table sits some sort of mechanical device. Several students hover over it, tinkering with what appears to be some sort of motorized limb. The scene looks like shop class, physics, and computer lab all rolled into one.

At one point, one of the instructors reminds the students of a formula they learned earlier in the semester. You’re reaching back into your memory, grasping for some long-forgotten concept from physics or maybe calculus. The cue from the teacher sends the teenagers back to the mechanical device with a flurry of adjustments. As you watch, you realize that the object is a robot.

Now you’re sure you’re not in the right place. Where are all those disengaged students you’ve heard so much about? The long rows of desks? The droning teacher? Not here, you think to yourself, wondering if you’ve entered some alternate universe.

These students are experiencing a style of teaching and learning that focuses on a mix of career skills, academics, and real-world application. It’s a retooled version of vocational education called career and technical education, or CTE. And it’s making its way into schools across the nation, not only at the high school level, but in middle grades as well. Delivered in a variety of settings, CTE often uses hands-on applications with a strong focus on technology to engage students in their learning, and usually focuses on a broad industry or career, such as engineering, the justice system or health sciences.
Vocational Education vs CTE: What’s the Difference?

The National Association of State Directors of Career Technical Education Consortium, known as the State Directors, developed a visual representation of the key differences between vocational education and the retooled version known as CTE, below.¹

<table>
<thead>
<tr>
<th>Vocational Education</th>
<th>Career and Technical Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical skills in isolation</td>
<td>Technical preparation supported by rigorous academics and employability skills</td>
</tr>
<tr>
<td>Preparation for a job</td>
<td>Career preparation for lifelong mobility and advancement</td>
</tr>
<tr>
<td>Education for those who can’t go to college</td>
<td>Dual preparation</td>
</tr>
<tr>
<td>Compliance driven, program focused, instruction centered</td>
<td>Performance driven, industry focused, student centered</td>
</tr>
</tbody>
</table>

CTE—A Window of Opportunity

There are a number of forces converging to place CTE at the forefront of the education reform agenda. First and foremost, the global economy and the desire for the United States to remain competitive is an undeniable driving force in career-related education gaining ground in education reform efforts in recent years. CTE offers a clear roadmap for students who are interested in a particular career or industry and provides opportunities for all students to explore career possibilities in a low-stakes environment. Another compelling reason behind the attention focused on CTE is the lackluster academic performance of students in
the United States, particularly that of low-income and minority students. Studies have shown that CTE can have a positive impact, especially for those students most at-risk of failing, or worse, dropping out. CTE also offers a connection to school for many students—providing that “hook” that captivates and engages them in learning. The hands-on, practical aspect of CTE epitomizes the notion of life-long learning that will be the norm in the 21st century economy—preparing students with real, tangible skills and opportunities to pursue their interests in postsecondary institutions and the workplace.

Student Performance

Far too many students don’t fare well when it comes to academic achievement. Scores for high school students in particular have remained stagnant. Seventeen-year-olds have seen virtually no change in reading scores since 1971, regardless of race/ethnicity. SAT scores, designed to gauge how well a student will fare in postsecondary education, show white students scoring 527 in reading and 536 in math. Hispanic students, by comparison, score only 458 in reading and 463 in math. Black students fare even worse—434 in reading and 429 in math.

The most recent reports place the dropout rate at 9.3 percent among 16-24-year-olds. Yet upon closer examination, there are troubling figures: while 5.8 percent of white students drop out, the figure jumps to 10.7 for black students and 22.1 percent for Hispanic students. And while 87 percent of all 25- to 29-year olds have earned a high school diploma or a GED, we continue to see a gap for our black and Hispanic students. Eighty-eight percent of blacks earned diplomas compared to 93 percent of white students, yet only 65 percent of Hispanic students completed high school requirements. What’s more, because of non-uniform reporting and missing data from schools, districts, and states, the reality of the dropout problem is likely far worse than these statistics indicate, especially when viewed in terms of high school completion. According to Education Week, only 71 percent of ninth graders graduate in four years with their peers, a figure that is more in line with the findings of many other organizations and researchers.

Why is this so important? While a high school diploma was once a valued asset in the job market, today it’s a bare minimum for entry into the workforce. Those who stick it out and graduate from high school are 15 percent more likely to be employed than their peers who drop out. What’s more, the average income for a high school dropout is just over $16,000 a year—just above the federal poverty line for a married couple ($14,000) and below the threshold for a family of three ($17,400)—and nearly $10,000 below the annual income

“The one million students who drop out of high school each year cost our nation more than $260 billion dollars. That’s in lost wages, lost taxes, and lost productivity over their lifetimes….Business, political, and education leaders are regularly sounding the alarm. When we lose a million students every year that has a tremendous impact on our economy. And it represents the American Dream...denied.”

—Margaret Spellings, U.S. Secretary of Education
one study in particular found that high-risk students were 8 to 10 times less likely to drop out of school if they were engaged in a CTE program.12

Looking beyond the statistics to ask why some of these figures persist despite education reform efforts, there are some clear answers from students themselves. Perhaps the most prominent answer is that many students are disengaged from the educational process. In a 2006 study of high school dropouts, 69 percent of respondents said they were not motivated to work hard in school, while 47 percent said a major reason for dropping out of school was that classes were not interesting.13

Another study, the 2006 High School Survey of Student Engagement (HSSSE), found that…

• Just 61 percent of students agreed or strongly agreed that if given the option of selecting a high school, they would go to the same school again;

• Only 55 percent of students agreed or strongly agreed that they felt they were an important part of their high school community; and

• Only 72 percent agreed or strongly agreed that they were engaged in school.15

What’s more, while we focus much of our efforts on high school reform as the answer to a more engaged and successful student body, the problem of engagement begins much earlier for many. Research has shown that 6th grade students who attended school less than 80 percent of the time, received poor behavior-related grades, and who failed mathematics and/or English had only a 25 percent chance of graduating.16 According to the researcher, half of all future dropouts begin the process in the middle grades—a figure that all policymakers and educators should remember when crafting solutions to address the dropout crisis in our nation’s schools.

**The Competitive Edge**

Global competition and the economy are another reason that so many are looking to CTE as an important component of public education today. Garnering attention from federal, state, and local policymakers alike, the future of our economy is high on the agenda of many in the United States. As just one indicator of the level of interest, one report noted that the 109th Congress alone introduced more than 300 bills that included the word “competitiveness.”17
Our economy has shifted and is now demanding a more skilled and educated workforce. According to the Bureau of Labor Statistics, the 30 fastest-growing occupations include a range of health-related professions, including home health care, mental health, and dental health, as well as numerous high-tech jobs such as network systems analysts. Of the 30 careers listed, 19 require at least a bachelor’s degree. Of the Bureau’s list of the 30 occupations with the largest employment declines, nearly all require only minimal on-the-job training. This indicates a shift in the types of careers that will be available to graduates, and while not all future jobs will require a college diploma, the reality is that postsecondary training, whether it is an industry certification program, community college, or university, is the wave the future for students leaving our public education system.

These two converging forces—stagnant achievement rates and global competition—have created a window of opportunity for CTE, and some policymakers are already moving forward with new policies, funding, and initiatives. Florida and California are just two states with recent policy activity. In Florida, every high school is required to establish a career academy under new legislation signed into law earlier this year, while California expanded state funding for CTE, specifically for career academies. Early in 2008, New York City Mayor Michael Bloomberg established a task force to examine CTE in the city’s school system. The result was a detailed report on overhauling the school system’s career-related studies, including collaboration with the New York State Board of Regents.

American Competitiveness Initiative

In February 2006, President Bush announced the American Competitiveness Initiative. Stating that “we can do more to provide American students and workers with the skills and training needed to compete with the best and brightest around the world,” the goals of the initiative included:

- 300 grants for schools to implement research-based mathematics curricula and interventions;
- 10,000 more scientists, students, post-doctoral fellows, and technicians provided opportunities to contribute to the innovation enterprise;
- 100,000 highly qualified math and science teachers by 2015;
- 700,000 advanced placement tests passed by low-income students; and
- 800,000 workers getting the skills they need for the jobs of the 21st century.
Despite this attention, concerns remain about the current state of CTE and just how to propel career learning to the next level of excellence in preparing students for postsecondary education and beyond. The image of CTE with parents, guidance counselors, and even educators remains an enormous hurdle for CTE proponents. And the logistics of CTE are unclear: how should it be delivered? Should there be a stronger focus in high school or postsecondary? Who should take CTE and when? What does highly qualified mean for a CTE instructor? What should a student leave with at graduation? These are just a few of the questions that state policymakers will need to grapple with when taking on the issue of career education. What follows is a look at some of these issues, including the students who take CTE, methods of delivery, and administration of career and technical education.
2. A Snapshot of CTE in American Schools

The most recent study of career and technical education by the National Center for Education Statistics (NCES) found that more than 96 percent of public high school graduates took at least one CTE course, and roughly 21 percent took three or more credits (those taking three or more CTE credits are called “concentrators”). Students, on average, earned four credits in CTE, reflecting little change in the participation rates of students dating back to the earliest study in 1990. There was, however, an interesting shift in the characteristics of students taking CTE between 1990 and 2005. The study found that compared with their counterparts in 1990, a larger percentage of graduates in 2005 who were CTE concentrators took higher-level mathematics courses when they were in the ninth grade.

Students are exposed to CTE in many ways. In high schools, and even some middle schools, elements of CTE can be found in comprehensive schools, CTE-focused high schools, CTE-focused career centers within a district, or career academies within schools. In California, for example, all four models exist. Postsecondary institutions incorporate CTE in community colleges, technical colleges, and four-year institutions. Work-based environments also incorporate CTE through internships and work-based learning.

Roughly 88 percent of high schools and 90 percent of postsecondary institutions offered CTE courses to students, with business and computer science as the most common course offerings. Ninety-six percent of all schools with CTE course offerings include a focus on business, while 94 percent offer computer sciences. Both secondary and postsecondary schools found the biggest shift in participation toward health-related fields, as well as computer science. And though graduation requirements vary by state, most tend to have career education as a course option for graduation (28 states), while 21 go one step further, allowing CTE courses to substitute for approved core academic courses. To date, only 12 states provide students with the opportunity to earn an endorsement or diploma in CTE.

The teacher profile of CTE is more difficult to pinpoint. Studies have focused on postsecondary instructors, leaving little understanding of who teaches career courses in high schools. Ac-
Learning to Work, Working to Learn

According to the Education Commission of the States (ECS), 27 states have policies related to CTE educator quality. Policies range from requiring proficiency in the field of teaching to alternative and traditional certificates. Alabama, for example, requires “the National Occupational Competency Testing Institute exams for measuring content knowledge. For a program to be certified, teachers must possess knowledge and skills as prescribed by industry standards and the department of education. Teachers must continually maintain industry certification and/or teacher certification.”

In Maryland, however, teachers have several options, according to the ECS analysis:

- Earn a bachelor’s or higher degree in a state approved CTE program and provide official verification of two years of previous satisfactory occupational experience in the trade to be taught.

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Organizing CTE Instruction and Learning: Career Clusters

The National Association of State Directors of Career Technical Education Consortium spearheaded an endeavor in which industry leaders and educators created an organizing mechanism for career learning in schools. The result of this effort was the development of 16 career clusters, which are simply a grouping of like industries and occupations. Many states now adhere to the career cluster organization, although sometimes combining industries into fewer than the original 16 clusters. For students, the clusters provide an easy-to-use map of career interests linked with courses and potential career outcomes. The 16 Career Clusters, which are organized by skills needed by all in a particular broad industry or industries, include:

- Agriculture, Food & Natural Resources
- Architecture and Construction
- Arts, A/V Technology, and Communications
- Education and Training
- Finance
- Government and Public Administration
- Health Science
- Hospitality and Tourism
- Human Services
- Information Technology
- Law, Public Safety, Corrections, and Security
- Manufacturing
- Marketing, Sales and Service
- Science, Technology, Engineering, and Mathematics
- Transportation, Distribution, and Logistics

While the career cluster concept appears straightforward enough, it sometimes gets confused with a “career pathway.” The two concepts are inter-related, but a career pathway is a more refined grouping of occupations within a cluster. For example, within the Law, Public Safety, Corrections, and Security cluster there are five career pathways: legal services; corrections services; fire and emergency management services; security and protective services; and law enforcement services.

Additional information is available online at www.careerclusters.org/index.php.
• Have a bachelor’s or higher degree in industrial arts/technology education or in the trade to be taught and provide official verification of two years of previous satisfactory occupational experience in the trade to be taught.

• Earn an associate’s degree in the trade to be taught or a bachelor’s or higher degree from an institution of higher education and provide official verification of three years of previous satisfactory occupational experience in the trade to be taught.

• Have a secondary school diploma or the equivalent and official verification of five years of previous satisfactory occupational experience in the trade to be taught and verify two years full-time employment.30

As with core academic subjects, the issues here are complex. School administrators want to ensure that a high-quality teacher is leading the classroom, yet what professional experience and academic credentials should an electrician hold? A bachelor’s degree? An industry certificate? Certain years in the trade? Teacher education coursework? These are not easy answers. What’s more, the supply and demand issue in teacher hiring is perhaps even greater in CTE, where the most knowledgeable instructors will come from the field, not schools of education.

**Beyond the Classroom: How CTE is Funded and Administered**

CTE is run differently, in some ways, from traditional education programs, beginning with how funds are allocated from the federal government. While several federal initiatives, housed both in the U.S. Department of Education and the U.S. Department of Labor, support CTE-related activities, it is primarily the Carl D. Perkins Career and Technical Education and Improvement Act of 2006 that drives much of what we see in classrooms today. Perkins dollars are the largest source of federal funds for high schools, so how these funds are used is critical to understanding how our high schools work, and more importantly, how they don’t work.

At the state level, CTE is managed very differently from one state to the next (see chart on page 19). Unlike under the No Child Left Behind Act, where the state education agency and the state board of education have oversight for policy and implementation, with CTE there

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**Percentage of Public Schools with a 10th Grade that Offered Occupational Programs, by Program Type, 2002**

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>96.5</td>
</tr>
<tr>
<td>Computer Technology</td>
<td>94.4</td>
</tr>
<tr>
<td>Mechanics and Repair</td>
<td>81.9</td>
</tr>
<tr>
<td>Precision Production</td>
<td>78.9</td>
</tr>
<tr>
<td>Construction</td>
<td>73.5</td>
</tr>
<tr>
<td>Child Care and Education</td>
<td>68.3</td>
</tr>
<tr>
<td>Health Care</td>
<td>64.9</td>
</tr>
<tr>
<td>Agriculture</td>
<td>62.4</td>
</tr>
<tr>
<td>Other Technology</td>
<td>58.3</td>
</tr>
<tr>
<td>Marketing</td>
<td>57.9</td>
</tr>
<tr>
<td>Food Service &amp; Hospitality</td>
<td>57.4</td>
</tr>
<tr>
<td>Communications Technology</td>
<td>53.6</td>
</tr>
<tr>
<td>Other Occupational Programs</td>
<td>48.2</td>
</tr>
<tr>
<td>Personal &amp; Other Services</td>
<td>48.0</td>
</tr>
<tr>
<td>Trade &amp; Industry/Transportation</td>
<td>28.8</td>
</tr>
<tr>
<td>Protective Services</td>
<td>25.8</td>
</tr>
</tbody>
</table>

Perkins: the Federal Government’s Role in CTE

The Carl D. Perkins Career and Technical Education and Improvement Act of 2006 (Perkins IV) provides the only source of federal funds for career and technical education, and is the largest source of federal funds for high schools. The legislation maintains a separate federal funding stream for career and technical education, currently set at $1.16 billion, plus $103 million for the Tech Prep program. And for the first time, references to “vocational” education have been changed to “career and technical” education.

Yet for all of the support for the program overall and reforms in particular, there has been scant ability to increase the funding, which has been stagnant for nearly a decade. Building upon the strengths of earlier authorizations, Perkins 2006 provides greater focus on the academic achievement of career and technical education students, works to strengthen the connections between secondary and postsecondary education, and increases state and local accountability. The overarching purpose of the Perkins Act is “to develop more fully the academic and career and technical skills of secondary education students and postsecondary education students who elect to enroll in career and technical education programs.”

Accountability

While accountability was already a strong component of earlier authorizations, Perkins IV strengthens state accountability provisions and extends the accountability system to local programs for the first time. State and local programs are required to report on separate core performance indicators for secondary and postsecondary secondary students. The secondary student indicators include:

1. Student attainment of challenging academic content standards and student academic achievement standards, as adopted by a state under NCLB, and measured by the state academic assessments used for NCLB.

2. Student attainment of career and technical skill proficiencies, including student achievement on technical assessments, that are aligned with industry recognized standards, if available and appropriate.

3. Student rates of attainment of each of the following: 1) a secondary school diploma; 2) a General Education Development (GED) credential, or other state-recognized equivalent including recognized alternative standards for individuals with disabilities; 3) a proficiency credential, certificate, or degree, in conjunction with a secondary school diploma (if such credential, certificate, or degree is offered by the state in conjunction with a secondary school diploma).

4. Student graduation rates (as defined by NCLB).

5. Student placement in postsecondary education or advanced training, in military service, or in employment.
6. Student participation in and completion of career and technical education programs that lead to non-traditional fields.

Plans submitted to the Department of Education by states included target performance levels for each of the core performance indicators for secondary and postsecondary. Local programs can accept the state performance targets or work with the state to negotiate different performance levels. States and local recipients of Perkins funds that fail to meet at least 90 percent of the target level of performance for any core performance indicator must develop and implement a program improvement plan. If no improvement is made or the program fails to meet at least 90 percent of a performance level for three years in a row, then all or a portion of Perkins funds may be withheld.

**Programs of Study**

Another key feature of Perkins IV is the requirement that states develop and implement career and technical programs of study. States must develop the programs of study in consultation with local programs, and each local recipient of Perkins funds is required to offer the relevant courses of at least one program of study. Programs of study must:

- Incorporate secondary education and postsecondary education elements;
- Include coherent and rigorous content aligned with challenging academic standards and relevant career and technical content in a coordinated, non-duplicative progression of courses that align secondary education with postsecondary education to adequately prepare students to succeed in postsecondary education;
- May include the opportunity for secondary education students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary education credits; and
- Lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or bachelor’s degree.

Programs of study are very similar to and build upon other initiatives already in place in many states such as career academies, career pathways, and career clusters.

**Promoting Partnerships**

Perkins IV actively promotes collaboration with business and industry in advancing CTE. In fact, one of the new purposes of the law is, “Supporting partnerships among secondary schools, postsecondary institutions, baccalaureate degree granting institutions, area career and technical education schools, local workforce investment boards, business and industry, and intermediaries.”

Additional information on Perkins is available online from the U.S. Department of Education, Office of Vocational and Adult Education at [www.ed.gov/about/offices/list/ovae/index.html](http://www.ed.gov/about/offices/list/ovae/index.html).
is considerable variation in governing agencies, ranging from state boards of education and state education agencies to workforce investment boards and state colleges and universities, befitting the hybrid school-work and secondary/postsecondary connections unique to courses of study and training. Despite these fluctuations in oversight, most state education agencies administer the K-12 portion of the program.

As with oversight, funding for CTE varies from state to state. Some states have separate funding formulas for career and technical education programs. For example, the formula in Kansas provides 1.5 full-time equivalency for students enrolled in approved CTE coursework. Other states have no separate funding provisions for CTE. And still others, such as Kentucky, use an assortment of methods. Kentucky’s School-to-Careers Grant Program is designed to provide matching funds for plans that include:

- A comprehensive career awareness and exploration program for all students in grades K-8 to include study of Kentucky’s fourteen (14) career clusters;

- High-level academic and vocational courses for all secondary students to replace a general track curriculum;

- A comprehensive career guidance program to assist all secondary students in developing individual graduation plans;

- Applied academic instructional models for all disciplines and integration of academics and vocational education curriculum;

- Implementation of industry skill standards within all relevant academic and vocational education programs;

- Planned instructional programs to meet the needs of students with disabilities and other special needs students;

- Opportunity for students to receive, in addition to a high school diploma, a Career Major Certificate upon completion of the high school graduation requirements, work-based learning experiences, specific course work, and a career culminating project;

- Opportunity for students to participate in structured work-based learning;

- Linkages with postsecondary institutions that create a smooth and seamless transition from secondary to postsecondary education;

- Professional development for faculty and staff focused on developing integrated and applied curriculum; and

- A School-to-Careers Partnership Council composed of representatives of business, labor, education agencies, parents, students, teachers, administrators, and community organizations.
# State Governing Entities for Career and Technical Education

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**Other**

- Colorado—State Board for Community Colleges and Occupational Education
- Connecticut—Office of Workforce Competitiveness
- Kentucky—Workforce Investment Board
- Minnesota—State Colleges and Universities
- Montana—Board of Regents

Established more than 30 years ago, the goal of career academies is to prepare students for postsecondary education and/or employment. Academies are usually organized as small learning communities, serving between 150 and 200 students starting in grades 9 or 10 through grade 12. Today there are more than 4,800 career academies across the country, although the programs vary from school to school.

Career academies tend to focus on a particular career theme, for example, finance or engineering, and adhere to a curriculum focused on both technical and academic skill attainment. Business and community partnerships usually play a key role in academies, as do internships and career mentoring.

At the state level, California in particular has embraced the career academy model. In the 1980s, California passed legislation creating state-level funding for career academies, called the California Partnership Academies, or CPA. The CPA is still in existence today and just recently received an influx of new monies to expand the academy model into more schools.

Career academies, such as the model put forward by the National Academy Foundation (NAF), often report compelling success rates. One study found that more than 90 percent of NAF students graduate, in comparison to 50 percent in the urban areas where most NAF academies are located. NAF goes on to report that four out of five students go on to postsecondary education, with 52 percent completing a four-year degree in four years. Another study by MDRC found that graduates of career academies produced earnings that averaged 11 percent more a year than non-academy graduates—an increase in earnings of $16,704 in earnings over the course of the study. This was especially concentrated among young men, who saw an increase of 17 percent a year.
The NASBE Study Group engaged in six months of intensive study and discussions through readings and presentations from experts nationwide. The result of the deliberations is a set of six recommendations for state boards of education to consider as they incorporate the role of CTE into their state’s overall vision and plan for education.

Recommendation: Provide meaningful opportunities for all students to engage in rigorous and relevant career and technical education, both at the high school level and in the middle grades.

One thing became clear as the members of the Study Group deliberated—CTE should be a component of every student’s educational experience. This should not be interpreted as providing every student with a cookie-cutter model of learning nor is it a “feel-good” assumption that a single CTE course will give every student experience and insight into the benefits of career education. Quite the opposite. States should actively work to provide a range of experiences that expose students to career-related clusters, allowing students to focus on a particular career pathway or to experiment with courses across career strands, while simultaneously incorporating a strong academic base. The goal is to allow students to have the opportunity to choose their own path in life, whether that choice is work after high school, a direct route to college, or perhaps even work that’s followed by college at a later date. No student should be faced with roadblocks when it comes to his or her career and life aspirations, and learning should be both demanding and relevant for every individual. This discussion is often referred to as “multiple pathways” in the CTE field. As defined by the California-based think tank ConnectEd, “students pursue a pathway over multiple years and graduate prepared for the full range of post-graduation options—which can include two- or four-year college, certificate programs, apprenticeships, formal job training, or military service.”

A program such as High Schools That Work (HSTW), which combines college prep with CTE, is one of the more successful strategies being used in some pockets of the country to address both rigor and relevance in the classroom. Another program, Project Lead the Way,
Learning to Work, Working to Learn

has garnered attention for its curriculum that encourages students to explore careers in engineering and biomedical sciences, exposing them to hands-on, experiential learning in mathematics, science, and technology.

The Study Group also recognized the importance of exposing students to career learning before high school. With so much focus on 9th grade as the “dropout” year, it is imperative that policymakers and educators expose students in the middle grades to CTE. For many disengaged students, CTE may be the answer to the question, “Why should I stay in school?” Most students today are told what courses to take, when to take them, and how often for their entire educational career. Offering choices—choices that allow a student to see firsthand what will result from their hard work, whether it is college, a career, or even an internship during high school—is a powerful engagement strategy.

Project Lead the Way, cited above, also hones in on the early years—especially the middle grades. The curriculum includes a nine-week unit for grades 6 to 8 that exposes students to the field of technology. Units include:

- Design and modeling;
- The magic of electrons;
- The science of technology;
- Automation and robotics; and
- Flight and space.

Finally, the issue of “learning-by-doing” was prominent throughout the Study Group presentations. One example the Group heard about was the new health sciences curriculum developed by Engines for Education. Part of a larger virtual academy, the health sciences curriculum includes ten rotations for students of three to four weeks that involve solving problems faced by real professionals. The goal is for students to learn about what it would be like to work as a practitioner in various health-related careers. While debate continues over what strategies should be used to engage students, it seems clear that exposure to hands-on learning can be beneficial to many students, especially as they explore career learning.

**Recommendation: Engage industry and community leaders in meaningful partnerships.**

State boards of education and business leaders should join forces to drive an education agenda that will promote 21st century learning: learning that focuses on developing our nation’s workforce and its citizens. The days of business leaders writing blank checks to the education establishment are over. Industry wants a return on its investment, and that return is in the form of a well-prepared workforce.

What’s more, industry gets the concept of CTE as the new retooled vocational education: walk into any McDonald’s in the United States and chances are you’ll see a recruitment poster that says, “It’s not just a job, it’s a career,” followed by statistics on how many employees who work the line become managers, owners, and even go on to work at corporate headquarters.
Career Planning Guidance

Educators have long developed individualized plans for special education students to outline each child’s educational goals and progress. Now some are arguing that all students should have individualized learning plans, especially leading up to and in the high school years when students are most at-risk of dropping out. Developing a personalized plan that includes a student’s goals for his or her academic coursework and postsecondary career interests is just one way that students, parents, guidance counselors and teachers can work toward ensuring a successful transition into high school and beyond.

In Florida, for example, the Secondary Redesign Act requires as part of graduation requirements that students entering the freshman year of high school declare a major area of interest, or MAI. In Ohio, the Individual Academic and Career Plan (IACP) is an online, self-directed planning tool designed to help students as they navigate postsecondary education and career-related options. The IACP not only provides an individual portfolio for each student, it does so using technology. The IACP is also linked to the Ohio Career Information System (OCIS), which is an Internet-based career information and planning system. The OCIS includes labor-related figures, as well as advice on preparing for a job interview and writing a resume and cover letter.

Below are results from the most recent study of CTE highlighting schools that offer career planning guidance for secondary students.44

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<th>Percentage of Public Schools with a 10th Grade Offering Selected Career-related Activities, by Extent of Activity and School Type, 2002</th>
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<td>Full-time CTE High School</td>
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<td>Comprehensive High School Served by an Area CTE School</td>
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<td>Comprehensive High School not Served by an Area CTE School</td>
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* Interpret data with caution.

Business leaders are letting educators know just how critical 21st century skills are to the success of our economy. State policymakers can play a leadership role in infusing these critical skills into appropriate policies and programs. Many states have already begun to incorporate 21st century skills into policy and practice. Iowa, Kansas, Maine, Massachusetts, New Jersey, North Carolina, South Dakota, West Virginia and Wisconsin are just a few states that have been recognized by the Partnership for 21st Century Skills, an advocacy organization that works to infuse 21st century skills into education.

The Partnership encourages schools to focus on themes such as global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; and health literacy. Learning and innovation themes, such as creativity and innovation; critical thinking and problem solving; and communication and collaboration are also important, as is the need to develop information, media, and technology literacy. Life and career skills make up the third critical piece and include flexibility and adaptability; initiative and self-direction; social and cross-cultural skills; productivity and accountability; and leadership and responsibility.

Policymakers and educators should engage industry leaders in meaningful discussion about how to drive change in education that will result in meaningful results for all students. Businesses can offer content-rich resources, standards for the industry, internships and career pathways, curriculum materials, and financial support for classroom materials. Schools, in turn, can offer business access to future employees, providing business with an opportunity to engage with students by exposing them to possible career pathways.

To facilitate these partnerships, state boards of education should support the convening of other state-level stakeholders, such as the chamber of commerce, the workforce development board, the legislature, the governor, other labor-related agencies, community college and higher education, P–20 councils, and industry leaders in an effort to connect economic and education issues. Throughout the Study Group’s discussion we heard from many state board members who had little or no connection with the “business” side of the state—missing a window of opportunity. Education and labor cannot continue to work in silos if CTE is to be successful in engaging and educating a highly skilled workforce. Beginning the conversation with other interested parties is just the first step in developing a comprehensive strategy that should align economic and educational goals for each state.

The Ford Partnership for Advanced Studies (Ford PAS)

Ford PAS is a standards-based program developed by the Ford Motor Company in partnership with the Education Development Center. Recognizing a need in its workforce development efforts, the company created a curriculum that introduces high school students to business, engineering, science, and technology careers using an interdisciplinary approach. Materials focus on developing academic knowledge; problem-solving, critical thinking and communication skills (often referred to as 21st century skills); and business concepts, such as finance, marketing, and global economics. The seven semester-long courses include topics such as media and messages: building a foundation of communication skills; closing the environmental loop; from data to knowledge; and markets without borders, alternative energy, and personal finance, just to name a few.

A critical element of the Ford PAS program is the establishment of partnerships. Each Ford PAS school forms a Business/Education Advisory Council (BEAC), which includes a range of stakeholders, such as local business representatives, higher education officials, parents, teachers, and even students. The BEAC plays an integral role by providing internships, mentoring students, hosting field trips, providing in-kind contributions such as scholarships, and even providing technical assistance.

More information on Ford PAS is available online at www.FordPAS.org.
Agriculture Education: The Illinois Model

Agriculture is the largest industry in Illinois, employing one out of every four people, so it is no wonder many stakeholders are focused on preparing students for careers in agriculture. The state has developed a comprehensive system of supports at the state level that includes:

- The Illinois Leadership Council for Agricultural Education, which serves as a grassroots industry group;
- The Illinois Committee for Agricultural Education, a 13-member committee that advises the governor and state education agency on agriculture education;
- The Illinois State Board of Education, which oversees K-12 education, including CTE and agriculture education;
- The Facilitating Coordination in Agricultural Education (FCAE) Project, which includes district-level staff whose primary focus is on improving agriculture education in kindergarten through the postsecondary years;
- Team Ag Ed, composed of professional staff from the above groups;
- The Illinois FFA Center, which serves the FFA and agricultural education teachers;
- Illinois Foundation FFA, established to support quality agricultural education and FFA programs in Illinois;
- The Illinois FFA Alumni Association;
- FFA, the student organization for agriculture education;
- The Illinois Association of Community College Agriculture Instructors;
- PAS, the Illinois Postsecondary Agricultural Student Organization; and
- Illinois Ag-In-The Classroom, an array of statewide literacy initiatives.

These types of partnerships serve the economic well-being of the state, as well as the future careers of its students, and is just one example of how state leaders have come together to form partnerships that align with the goals and needs of the state.

Maryland: Meeting Regional Needs with Local Programs

In Maryland, CTE programs have been designed to align with regional economic and workforce-development priorities. As a result, each school district doesn’t necessarily include every career cluster. Each school district in the state—24 in all, organized by county—is required to have a Local Advisory Council made up of employers and industry representatives, including union officials. The council then works with the school district on long-range planning for CTE.
Recommendation: Adopt policies to integrate CTE and academic coursework and standards, while providing multiple assessments to measure skill and knowledge attainment. Also, adopt policies to recognize students for career-focused learning.

Many industries have developed standards and core competencies, often with the aid of an array of stakeholders, including educators. For each state to develop unique standards for all 16 of the career clusters simply does not make sense—an auto mechanic in Kansas will need a similar set of knowledge and skills as an auto mechanic in Maine, and both states should ensure that a student’s career-based learning can transfer from one state to another.

A number of industries have also developed curricular materials, and they provide industry certification for skill attainment. Again, these are all important tools to incorporate into state plans, though care must be taken to align career-focused standards with core academic requirements. This latter effort is no small task—it is critical that career standards align with academic subjects to ensure transitions beyond high school, especially in creating a pathway for students interested in pursuing a four-year degree.

In Michigan, for example, a new law in 2006 outlined new high school graduation requirements called the Michigan Merit Curriculum. The new requirements allow for local flexibility in using CTE courses to earn credits for various academic subjects. For example, the state allows a district to award a student credit for algebra or geometry based on a building trades class, as long as the course covers the required content. The state is also working on aligning the curriculum for the career clusters with the required content expectations in order to provide schools with the appropriate credits that can be awarded. In addition to

The National Center for Construction Education and Research: Striving for a Highly Qualified Workforce

Global estimates are calling for more than a quarter million new jobs in the construction industry each year—one report by the Brookings Institution points out that “nearly half of what will be the built environment in 2030 doesn’t exist yet.” Recognizing the need to recruit young people into construction-related careers and for setting high standards for future employees, the construction industry has worked collectively with industry representatives, researchers, and educators to develop industry standards, program accreditation, instructor certification, a standardized curriculum, assessments and certifications, and credentials. The result of more than a decade’s work is a wide-ranging array of options for policymakers, educators, and students to choose from.

This comprehensive system for workforce development is housed within the National Center for Construction Education and Research (NCCER) in Florida and offers just one example of how industry is leading the way in ensuring a prepared and competent workforce for the future.

Detailed information on careers in construction, as well as the industry’s guidelines for standards, assessments, certifications, and curricular materials, is available online at www.nccer.org.
New York: A Model for Integrating, Assessing and Awarding Mathematics and Science Credits in CTE

The Southern Regional Education Board (SREB) has many documents highlighting strong models of integrating CTE and academic coursework in schools, districts, and states. The following is an example from one of SREB’s latest research efforts:

The New York State Education Department has implemented an option for awarding academic credit to students in career/technical education programs. The templates and other materials that have been developed may be of interest to other educators seeking to integrate mathematics and science into their career/technical education programs to ensure that students can apply what they have learned and can demonstrate mastery on national and local tests.

The Erie-2 Chautauqua-Cattaraugus BOCES (Board of Cooperative Educational Services), located near Buffalo in western New York, launched a multi-year project to align state core academic standards and career/technical course content utilizing National Occupational Competency Testing Institute (NOCTI) assessments. The BOCES serves 27 school districts with more than 45,000 students. A total of 1,650 career-oriented students are enrolled in 52 career/technical programs at four educational centers in the district....

Specific competencies and skills tested in the NOCTI assessment are aligned with exemplary applications of the state academic standards in mathematics and science. In the context of the mathematics standards, culinary arts students, for example, would be able to: 1) recognize and use connections among mathematics ideas; 2) understand how mathematics ideas interconnect and build on one another to produce a coherent whole; and 3) recognize and apply mathematics in contexts outside of mathematics. Therefore, students in the course would be expected to demonstrate and apply how to “use mathematics to control food costs, develop recipes and control quantity.” They would learn to “monitor food costs to ensure that a food service facility covers its operating expenses.”

Students who successfully demonstrate and apply the mathematics and science standards integrated into their career/technical course content are eligible for academic credit.

outlining graduation requirements, the law moved the state away from the old Carnegie Unit model to one that awards credits for proficiency based on content expectations rather than seat time.

One key question state boards of education should address is—what does a student leave with after completing a career cluster? A listing of courses may not benefit a student as much as proof of skill attainment. Whenever possible, states should adhere to industry standards, with every effort made to provide students with the opportunity to take career-based assessments and earn appropriate industry certifications.

**Recommendation: Ensure seamless transitions for students from high school to postsecondary and beyond.**

A student’s postsecondary education should be much like riding a bus from one end of the country to the other. Just as a passenger can easily get off the bus at any stop and board a different bus for another destination, so too should a student be able to easily transition between high school, community college, university, workplace, and trade school. Indeed, this is the reality of the 21st century labor market: the ability to adapt to changing circumstances, alter destinations, and acquire new skills as a worker desires or the market demands.

The transition from high school to postsecondary and beyond—whether at a community college, university, or through a trade-specific training program—is one of the biggest hurdles for many students. In many schools across the country we still see a hodge-podge of attempts at aligning secondary and postsecondary credits. One school may have an agreement with the local community college or university, but comprehensive, statewide efforts are few and far between. State boards of education should work with other policymaking bodies to ensure an easy-to-navigate transition of credits and skill attainment from high school, work, and postsecondary education.

This is one area where well-defined, comprehensive, statewide data systems are critical. Developing common course numbers and tracking the progress of students through their primary and secondary years can provide a wealth of data to help policymakers and educators make informed decisions about how to adjust policy and programming. What’s more, this is a key policy area where state boards can partner with community colleges and higher education institutions to ease the transition for students from one system to another.

The Florida State Board of Education, for example, has pushed seamless transitions to the forefront of reform efforts. The state provides opportunities for dual enrollment, early college admission, advanced placement, credit by examination, IB programming, and Tech Prep. Efforts include participation by all educational institutions in the Statewide Course Numbering System, as well as agreements to standardize transfer credits across the state.
West Virginia’s EDGE Program: Working Toward Seamless Transitions from High School to College

The Association of Career and Technical Education (ACTE) has noted several best practices in aligning secondary and postsecondary education. The following is an example from one of ACTE’s latest research briefs:

In West Virginia, the concept of Tech Prep has been developed into the EDGE program, which stands for “Earn a Degree, Graduate Early.” EDGE is backed by the state’s Department of Education, Council for Community and Technical College Education, and Higher Education Policy Commission. The EDGE program’s goal is to make the transition from high school to college more seamless by eliminating coursework duplication between the two levels and encouraging more mid-level students to continue their education beyond high school by exposing them early to college level coursework. EDGE was started to address concerns that not enough students were taking advantage of articulation agreements that were already in place throughout the state. Research found that students and parents did not understand the value of articulated credit, and that there were numerous barriers in place that kept students from actually receiving postsecondary credit for high school coursework.

In the EDGE program, students are now able to take high school courses for free community and technical college credit that is awarded immediately, and can save substantial time and money toward a postsecondary degree. Depending on the courses and career area a student chooses, he or she may save up to $3,000 and can earn an associate degree in a high wage career field, such as respiratory therapy or computer programming, as soon as one year after high school graduation.

Students must earn at least a “C” for a high school course and pass an end-of-course exam, developed jointly by secondary and postsecondary educators, to get the college credit, which can be transferred to one of the state’s community colleges and then to some four-year institutions. The end-of-course exam ensures that students are prepared for the next level of postsecondary education.

The program began during the 2003–2004 school year with just a few hundred students, and now enrolls about 40,000. Follow-up studies of students who have participated in the program have shown that remediation rates for EDGE students are much lower than throughout the community and technical college system. For example, only 16 percent of EDGE students enroll in developmental math, while the average is 57 percent of students system-wide. The potential return-on-investment of the EDGE program was estimated at $4,668,934 for the 2005–2006 school year.

Recommendation: Develop policies to address quality, recruitment, and compensation for CTE instructors.

Who teaches, when, and for what pay are perhaps the biggest questions for policymakers and school administrators. There is no one answer, but it is clear that innovative thinking is necessary. Because the No Child Left Behind Act mandates highly qualified teachers in all core academic subjects, states should evaluate requirements to determine how best to incorporate skilled CTE experts into the classroom, while maintaining high expectations for core academic learning. Some successful schools have joined together core academic teachers and CTE teachers using varying models of team-teaching to address this issue. But policymakers will still need to examine closely what constitutes a “knowledgeable teacher.” Should CTE teachers have professional experience in a particular career? An industry certificate? A degree from a community college or a university?

Pedagogy is also a critical element, and one that may prove challenging as most CTE instructors will come to the classroom with little or no training in teaching methods. And professional development may not come from traditional sources: states should explore the possibility of business involvement in providing professional development in order to keep CTE instructors on the cutting-edge of industry standards.

CTE teachers also have a unique role in linking what’s happening in the classroom with what’s happening in the outside world, especially in the workforce. This is particularly noticeable in career academies, where teachers may take the lead on administering programs and providing instruction. These teachers provide a critical link to the business community, often spearheading collaboration between educators and business leaders and coordinating internships and other hands-on activities for students. Salaries and workload should be examined to ensure that CTE teachers have sufficient time for instructional planning, collaborating with other teachers and professionals in the field, and carrying out the necessary components of a high-quality CTE program of study.

Higher salaries offered by industry often trump those offered to educators, creating challenges for school leaders in filling teacher vacancies. Again, unconventional solutions must be explored to place the most qualified teachers in CTE classrooms.

Addressing the CTE Teacher Shortage in New York City

Several ways for New York City schools to tackle quality, recruitment, and compensation issues for CTE teachers were suggested by the city’s Office of the Comptroller. “One approach,” the Office’s report said, “is for the State Education Department to provide persons who are experienced in an industry a provisional license to teach and several years, perhaps up to five, to obtain the needed education credits to be considered ‘highly qualified’ as required under the federal No Child Left Behind law. Another approach is to secure private money, perhaps through a foundation or partnering corporation, and, through collective bargaining, to allow supplemental compensation to CTE teachers in fields where teachers could earn substantially more outside of the classroom.”

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**Recommendation:** Address the poor image of CTE with educators, parents, guidance counselors, and the public.

Despite the shift from job-training in vocational education to career-training in CTE, there is still a stigma attached to the choice of being a CTE student. The most recent data on students who followed a vocational path in high school in the early 1990s provided good reason to doubt the idea of vocational education as an open pathway to the future: the more career courses completed by high school graduates, the less likely they were to enroll in postsecondary education.\(^5\)

The image problem of CTE is no small hurdle. The new mantra of education reform is “college for all,” and CTE has not traditionally fit that mold. New changes to the Perkins Act, however, have cleared the roadblocks to linking academic coursework with career-focused learning, allowing students to both prepare for college and for careers in high school. What is needed at this stage is an aggressive campaign to educate school administrators, teachers, guidance counselors, parents, and students about the promising results of CTE programs. Policymakers and business leaders will have to convince those with doubts that CTE is a worthy and rigorous course of study that prepares students for postsecondary education, work, and life.
4. State Boards of Education and CTE: A Call to Action

It is clear that career and technical education is taking the traditional focus of vocational education to a new level: on shifting the focus from a single path to a job to multiple pathways for postsecondary education and a career. CTE has the potential to be the roadmap for solving some of the most difficult issues in education today. Research has shown that CTE has a positive influence on preventing dropouts, increasing employment and in turn income, as well as providing a pipeline for industry and postsecondary education of well-prepared students who are ready and willing to learn. State boards of education have an important role to play in advancing the role of CTE within education reform, and should join others in their state to ensure that students are being exposed to a system of learning that provides them with the rigor and relevance needed to succeed in life beyond high school.

“The core problem is that our education and training systems were built for another era. We can get where we must go only by changing the system itself.”

—Tough Choices or Tough Times, New Commission on the Skills of the American Workforce
In addition to those resources mentioned throughout the report, below are key resources state boards of education and other policy groups can explore as they delve into the topic of CTE.

➢ The American Youth Policy Forum (AYPF) has sponsored numerous career-focused panels and publications. Online at www.aypf.org/.

➢ The Association of Career and Technical Education (ACTE) is the largest national education association dedicated to the advancement of education that prepares youth and adults for successful careers. ACTE is composed of more than 28,000 career and technical educators, administrators, researchers, guidance counselors, and others involved in planning and conducting career and technical education programs at the secondary, postsecondary, and adult levels. ACTE offers a wealth of resources online at www.acteonline.org/index.cfm.


➢ The National Association of State Directors of Career and Technical Education Consortium represents state professional staffs who oversee CTE. Online at www.careertech.org/.


➢ The Office of Vocational and Adult Education (OVAE), housed in the U.S. Department of Education, oversees the federal government’s CTE efforts, including Perkins funding. Online at www.ed.gov/about/offices/list/ovae/index.html.

➢ The Southern Regional Education Board (SREB) has done extensive work in the area of high school reform and CTE, including High Schools That Work. Online at www.sreb.org/.

➢ The U.S. Chamber of Commerce, Institute for a Competitive Workforce (ICW) focuses on aligning educational standards and workforce training to meet the needs of business. Included on ICW’s website is a report on public-private partnerships at the state level. Online at www.uschamber.com/icw/default.

➢ The U.S. Department of Labor offers a wealth of statistics on the labor market, as well as federal grants available to localities addressing workforce development. Online at www.dol.gov/.
Endnotes


5. Ibid.


9. Ibid.

10. Ibid.

11. Ibid.

12. Ibid.


15. Ibid.


23. Ibid.
24. Ibid.
26. Ibid.
29. Ibid.
30. Ibid.
31. Education Commission of the States, High School Database.
32. Ibid.
33. Ibid.
34. Ibid.
36. Ibid.
37. Ibid.
49. Ibid.