A Vision for High Schools:
Joining Academic and Technical Studies to

Promote More Powerful Learning

BY GENE BOTTOMS

One in four American students does not graduate from high school on time, if at all. Many of these young people blame schoolwork that failed to challenge them and assignments that meant nothing in their lives. More surprising are the large numbers of students who graduate from high school and enter college but do not receive a degree. They drop out even though tremendous efforts have been made in recent years to enroll students in more rigorous academic courses in high school. A key strategy for improving these trends is joining academic and technical studies together to create a program of study that helps students see a connection between education and careers and prepares them for success in further education and the workplace. This happens in too few high schools.

States seeking to improve student achievement, raise high school graduation rates and prepare more students for college and a career are encouraging high schools to blend rigorous academic studies with intellectually demanding career and technical education (CTE) studies. They are creating career pathways/programs of study designed to help students apply academic knowledge and skills to real-world problems and projects. Young people who struggle to find meaning in traditional academic classrooms often thrive when they are asked to tackle authentic projects and solve problems—the hallmarks of the best CTE courses. CTE programs that teach 21st century skills advocated by business and industry can provide the ingredients for schools to motivate more students to make the effort to succeed.

CTE Studies: Contributing to High School Reform

High schools that combine the essentials of a college-preparatory academic core with top-notch CTE studies and opportunities to use math, reading, writing and science knowledge, and skills in authentic projects and problems, can improve students' motivation to stay in school and graduate. The federal Carl D. Perkins Career and Technical Education Improvement Act of 2006 gives states unprecedented opportunities to align CTE with broader high school reform. For the first time, federal law requires that CTE courses include essential academic skills.

In June 2007, the Southern Regional Education Board and the Council of Chief State School Officers convened leaders from 12 states to explore how CTE can contribute to high school improvement. The leaders agreed that quality CTE studies must be linked with high school reform to dramatically increase the percentage of students who graduate from high school prepared for further study and careers.

One outcome of the forum was a publication, **Crafting a New Vision for High School: How States Can Join Academic and Technical Studies to Promote More Powerful Learning.** The report covers both the potential for an integrated academic and technical curriculum and the challenges that state, district and school leaders must overcome to make this happen. It describes successful policy initiatives states are implementing to "marry" academic and CTE studies through a variety of approaches. It also recommends actions states can take to address five major challenges they face in blending academic and technical content. The major contributions that CTE can make to high school reform include:

Improving academic skills to meet the demands of a complex, technology-based economy. CTE has the unique capacity to make college-preparatory academics available to students who have not experienced academic success by embedding and teaching rigorous academic content in the context of real-world problems, projects and activities. This can be done through programs of study (also called career pathways) that enable academic and CTE teachers to work together to help more students acquire and apply complex knowledge in mastering a multitude of real-world skills.

Increasing the nation's supply of highly qualified workers by connecting high school programs of study with postsecondary programs and students' career goals. Too few students prepare for careers that require an apprenticeship, certification, an associate or a bachelor's degree. To enter these careers, students must begin early in high school to complete a sequence of challenging academic **and** career courses that are aligned with college- and career-readiness standards and to emerging career fields.

Meeting the diverse learning needs of students and motivating more students to graduate. Broad-based CTE studies can be a lifeline for students who are in danger of dropping out of high school. Strong academic preparation is indispensable for college and work, but a one-size-fits-all approach is failing too many students. Schools need to provide multiple programs of study, beginning in the ninth grade, that enable students to learn essential academic knowledge and skills in a different way. Organized around authentic projects and blended with academic content, CTE studies can address the academic deficits of students who enter high school unprepared for traditional college-preparatory courses.

Broadening the definition of rigor to include the application of academic skills


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in a variety of contexts. Employers report that many recent high school graduates lack the reading, writing and mathematics skills they need to perform in entry-level jobs. They plead for new hires to be able to solve problems, think critically, work in teams and exhibit a strong work ethic. Hands-on projects that blend academic and CTE content can help students develop these skills and learn to use high-level literacy, math and science knowledge and skills. Authentic assignments provide opportunities for students to absorb information and make analytical judgments and inferences.

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Supporting strategies to improve low-performing high schools. A few schools have succeeded in personalizing learning and improving student achievement by organizing into small learning communities (SLCs) with an emphasis on broad career fields and authentic, project-driven instruction that offers opportunities for cross-curricular planning by academic and CTE teachers. Sometimes called academies, these schools-within-schools give academic and CTE teachers time to plan and work together to design activities and assignments that help students prepare for postsecondary studies and recognized employer credentials.

Challenges for States in Realizing the Contributions of CTE to High School Reform

States need to change the high school experience and their school accountability systems from a traditional college-preparatory model to one with multiple programs of study/pathways aimed at preparing more students for postsecondary studies and careers. State education agencies, boards of education, legislators, governors, school districts and high school leaders should work to create high schools that include more modern and flexible programs of career/technical studies aligned with essential college- and career-readiness standards. Taking these steps should result in higher graduation rates.

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Challenge 1: **Align new and existing CTE programs with college- and career-readiness standards.** States need to assist local school leaders to select the most essential standards in reading, writing and math to be embedded into CTE courses. Essential standards are those believed to be the best predictors of students' eventual success in college and the workplace. CTE courses that effectively embed academic and technical content into redesigned courses can allow students to see the relevance of their studies and to achieve at higher levels.

State Actions—After education and business leaders identify the most essential college- and career-readiness standards for reading, writing and math, the state will need to build the technical capacity of education leaders at all levels to align CTE courses with these standards and to teach embedded academic and technical content. States can assemble groups of educators and employers to prepare model course syllabi and sample authentic projects for high school CTE programs in high-demand, high-skill, high-wage fields. With accompanying end-of-course assessments, states will be able to validate the impact of such courses on academic and technical achievement. States also should adopt nationally recognized, high-quality CTE curricula, provide professional development for teachers, and conduct end-of-course assessments to ensure that students have mastered the academic standards and CTE materials and skills.

Some outstanding programs to consider are the financial and information technology academies from the National Academy Foundation and the engineering and biomedical sciences programs from Project Lead The Way. Each program features a solid academic core, blended academic and technical curriculum, a common end-of-course assessment and teacher training.

States can encourage schools and districts to redesign CTE courses to qualify for academic credit toward graduation and to meet college course-taking requirements in those CTE areas closely aligned to academic subjects. For example, chemistry credit could be earned through food and nutrition science and forensics. Geometry credit could be earned through construction and architecture courses. Biology credit could be earned through agriculture, animal and plant science, or health and medical courses. States will need to develop criteria and procedures for designing such courses, along with approval and assessment processes to ensure the academic knowledge and skills acquired through the CTE courses are similar to those acquired through traditional academic courses.

The Ohio Department of Education appointed workforce and academic reform teams to help struggling high schools reorganize around broad career themes with a rigorous academic foundation. CTE and academic teachers collaborate to align the curriculum to essential college- and career-readiness standards.

Kentucky adopted a policy that takes effect with the class of 2012 to allow approved CTE courses to substitute for required academic courses. This policy promotes the redesign of CTE courses to meet state academic standards and to include essential academic content through the context of career fields. For example, construction geometry, a carpentry course, embeds the 23 state standards for geometry. Further, Kentucky requires that CTE courses approved for academic credit be offered in double-block periods to allow students to earn both academic and CTE credits.

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Challenge 2: **Create a flexible system of multiple programs of study to prepare students for college and a career.** Schools struggle with how to offer a variety of career-focused programs of study to prepare diverse groups of students for college and a career. Schools need new strategies to reach students who perform below grade level when they enter high school, those who become disengaged with school, those who want to earn an employer certificate to qualify for a good job immediately after graduation, and those who intend to seek an associate or bachelor's degree. Using students' own interests, schools can provide them with the support they need to leave high school with more options for careers and postsecondary studies.

State Actions—States should enact policies to encourage school districts to provide programs of study leading to employer certification, an associate degree and/or a bachelor's degree for more students. They can also provide incentives for districts and schools to form partnerships with community and technical colleges, shared-time technology centers and employers. Effective partnerships give students access to high-quality CTE programs in growing fields such as business and finance, health sciences and information technology as well as in traditional, high-demand fields. States and school districts will need to allocate funds to implement a wide array of programs of study to prepare more students for a double purpose—college **and** careers.

Florida requires high school students to choose a major area of interest and complete eight credits in an academic or a career major, minor or electives— in addition to the academic core curriculum. A major can be a sequence of four courses in a CTE program, fine and performing arts or in an advanced-level academic area. Students can use the other four credits to pursue a second major or minor, to receive reading or math intervention, or to earn recovery credits.

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Challenge 3: **Create a policy framework to develop CTE and academic programs that link high school to college and a**

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career, blend academic and technical studies, and connect students to a goal. State policies need to lead more students to complete a college-preparatory academic core and a major in an academic or a CTE area. Students who complete a sequence of career/technical courses should be expected to pass graduation tests in reading, writing and math and to show they are equipped for college or earn employer credentials. A strong guidance and advisement system with personalized attention from a teacher/mentor will help students set goals and take the right courses to meet them. Enrollment in academic and technical courses benchmarked to college- and career-readiness standards that result in students earning high school and postsecondary credit can help students achieve their educational goals more quickly.

State Actions—States need to develop protocols and procedures to create programs of study with sequences of recommended academic and CTE courses. These courses should meet essential college- and career-readiness standards and lead more students to employer certification, an associate degree and/or a bachelor's degree. States should develop policies fostering the creation of redesigned CTE courses that are developed in collaboration between high schools and colleges that can raise achievement and, under certain conditions, count for both secondary and postsecondary credit.

The Oklahoma State Regents for Higher Education and the Oklahoma Department of Career and Technology Education are partnering to expand CTE students' access to postsecondary studies through a credit-transfer process that enables more students to enter college. Students can enter college courses beginning in the 11th grade, and more are learning that they can succeed in postsecondary studies.

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Challenge 4: Assess the contributions of CTE in improving academic and technical achievement.

The Perkins Act calls for states to measure both academic and technical achievement to determine the impact of CTE on improving student performance. Measuring CTE students' progress toward achieving academic standards can be challenging, since most CTE courses are offered in grades 11 and 12, and state assessments are often given in grades nine and 10. Furthermore, end-of-course assessments often ignore the fact that CTE courses often include academic concepts from a variety of subjects or courses, as dictated by workplace requirements and industry standards. CTE achievement also can be difficult to measure, since many states cannot afford to develop technical tests with the reliability and validity of academic tests. States can begin to overcome this challenge by adopting nationally recognized employer and industry-based certification exams, keeping in mind that some exams are occupation-specific and designed for adults, some require apprenticeships, and some have age requirements.

State Actions—States need to create policies allowing students to earn academic credit through CTE courses that are aligned with college- and career-readiness standards, are taught by qualified instructors, and measure students' mastery of academic content. States can hold schools accountable for raising the percentages of students who pass industry certification exams and enter college without needing remedial courses.

As states develop sample course syllabi for redesigned CTE courses, they can encourage the development of low-stakes, end-of-course exams to assess the ability of students within a given career field to: 1) read, interpret and analyze printed materials; 2) use math to set priorities and solve problems students may encounter in the workplace; 3) demonstrate the understanding of the biological, physical and social science concepts needed to function effectively in the field; and 4) demonstrate the foundational level of technical knowledge needed for continued learning.

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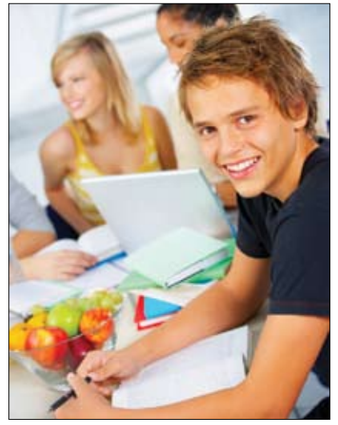

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The Virginia State Board of Education allows students meeting technical standards on a state-approved certification or licensure exam to earn up to two student-selected verified credits toward graduation.

Oklahoma law allows CTE students to meet a portion of the assessment requirement for graduation by passing state-approved, industry-recognized examinations in a technical field. Such exams must be knowledge-based, independently scored and available nationally, and must posses rigor that "equals or exceeds" other exams required by the state.

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Challenge 5: Prepare and support CTE instructors to teach essential academic skills through authentic problems, projects and activities.

The qualifications of CTE instructors vary widely: Some have little background in academic subjects, while others are "highly qualified" to teach blended CTE courses for academic credit. Regardless, CTE instructors need intensive and sustained professional development on the best ways to embed rigorous academics into CTE courses to advance both academic and technical achievement. Effective professional development will increase teachers' knowledge of academic and industry standards, help them assess students' performance on academic and technical standards, and develop data-analysis skills to identify students who need further support to meet the standards. The Perkins Act allows states to fund schools and districts to design and implement this type of professional development.

State Actions—States can adopt policies to strengthen the preparation and certification of career/technical instructors. Some states require CTE instructors to meet the same academic standards required of academic teachers by taking an exam or passing a classroom performance assessment, or demonstrate mastery of technical content by passing a state-approved external exam. States also should invest in professional development to help CTE instructors use project- and problem-based learning and workplace experiences to teach essential academic and technical content, problem solving, planning and other skills. States can also build school leaders' capacity to align curricula, assignments and assessments with college- and career-readiness standards; manage instructional change; obtain resources; establish flexible schedules; and design effective professional development for teachers.

Kentucky uses virtual instruction to place highly qualified teachers in CTE classrooms. Web-based instruction is a promising strategy for CTE education, but requires schools to embrace and integrate technology into the classroom.

A Sense of Urgency: Taking Action to Help More Students Succeed

For too long, states have overlooked the value of CTE in preparing more students for success in college and a career. Too many students fail to see how education links to their future, and too few graduate from high school with the skills they will need to achieve their goals. States, districts and schools need to work together to realize the contributions CTE can make to high school reform. High-quality CTE joined with rigorous academic studies is a key strategy for ensuring more students graduate prepared for postsecondary studies and careers. T

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This article is based on the SREB publication, *Crafting a New Vision for High School: How States Can Join Academic and Technical Studies to Promote More Powerful Learning.* The complete report is available online at **www.sreb.org**.