



The Evolution of Career and Technical Education in California

Ever since California began implementing its system of state academic standards, tests, and school accountability in 1997, the emphasis has been on the four core subjects of English, math, science, and history/social studies. Yet almost half of all high school students nationally—and likely about the same percentage in California—take at least three vocational or career classes. These classes may help students explore future career options, directly prepare them for post-high school training or work, or simply keep them interested and engaged enough in high school to pass their classes and graduate. As policymakers and educators have grappled with the overarching policy and instructional changes prompted by standards-based reform, this area of the curriculum has been nearly invisible.

It appears that is about to change.

This year both Gov. Arnold Schwarzenegger and President George W. Bush took aim at vocational education within the larger context of high school reform, with markedly different approaches. Bush sought to incorporate technical education funds into general funding so sites could use the money as they saw fit. Schwarzenegger has publicly supported career and technical education programs and suggested strategies for strengthening them in California.

This brief report provides basic background on how career and technical education is changing and its current status and scope in California. It also introduces some of the key issues that must be addressed as both state and federal leaders consider the next steps for this still important component of the high school curriculum.

Labels and expectations have changed

Say the words “vocational education” and most adults conjure up an image from their own high school experience. Typically, one group of students attended vocational programs daily—in areas such as auto mechanics or agriculture—while students heading for college

took academic classes instead. That type of formal vocational education received official government support as early as 1917 with the federal Smith-Hughes Act. Throughout most of the 20th century, vocational programs focused primarily on job skills and served students who were either struggling in an academic program or were just not seen as “college material.”

In the early 1990s that emphasis began to shift. Today even the name has changed. Most of the programs formerly called vocational education are now referred to as career and technical education (CTE) or career/tech. The formal definition on the California Department of Education website describes it as:

“A program of study that involves a multi-year sequence of courses that integrates core academic knowledge with technical and occupational knowledge to provide students with a pathway to postsecondary education and careers.”

The adoption of more rigorous academic standards for all students combined with increases in the skill level needed for most jobs mean that programs focused primarily

on technical skills need to increasingly include more academic content. For example, an auto mechanics class might consciously make an effort to include more basic physics principles in the curriculum to enhance the hands-on lessons.

Federal policy has driven some of this change. In 1994 the federal School-to-Work Opportunities Act lent support to a different type of career and technical education based on the integration of academic and vocational coursework. For a short period this approach was seen as the key element to successfully reforming high schools. Four years later, a reauthorization of the federal Carl D. Perkins Vocational and Technical Education Act sought to improve the quality and availability of career and technical education while also making changes to accountability and funding.

Advocates of integrating academic and technical skills, including the U.S. Department of Education, say that this better prepares students to adapt to changes in industry or to more easily switch careers.

The transition from voc ed to career/tech

	Vocational education through most of the 20th Century	New expectations for career and technical education
Purpose	Preparing students for entry-level jobs in occupations that did not require additional education or training beyond high school	Preparing students for technical careers or college-level classes with both technical and academic skills that will help them to adapt as industry needs and their fields change
Target Students	Those not intending to go to college	Any student interested in gaining particular technical skills
Academic Expectations	Low: Students enrolled in less rigorous math, science, and English courses than college-bound students	High: All students prepared with technical and academic skills, giving them more options after they graduate
The Economy and Its Needs	Many low- and medium-skill jobs available that provided sufficient wages to support a family	Most jobs with salaries that would support a family require completion of some training or education beyond high school. A base of strong academic skills is needed to help workers adapt to changes in the economy.

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Many feel that all students, including those who want to participate in career and technical programs, should have the academic preparation necessary to pursue college should they decide they want to. Finally, many people believe career/tech students frequently become increasingly inspired about school because they can see the relevance of their academic studies to the real world.

The hope is that an integrated curriculum will provide students with flexibility as they decide what to do after high school graduation. In California, approximately 25% of students entering high school complete the “a–g” requirements, the college-prep courses that meet the minimum standards for attending University of California (UC) and California State University (CSU) campuses as well as most four-year colleges. However, the remaining 75% of high school students are left with pathways that are less clear. An integrated curriculum can help students keep their options open. They are then better prepared to take advantage of possibilities after high school that might include moving directly into the workforce, gaining more advanced skills at a community college or technical school, or finding a job in their trade that would help put them through college. Those unsure of what they would like to do after graduation will be prepared either to attend college or find work using their skills.

The state is developing career/tech standards

For career and technical education to survive in a standards-based era, it has had to examine its own structure and relationship to the core academic subjects.

In 2002 California passed Assembly Bill (AB) 1412 and Senate Bill (SB) 1934, which mandated that the state develop career/tech curriculum standards and frameworks—as it has already done for the core academic subject areas, the arts, foreign languages, and physical education. State Superintendent of Public Instruction Jack O’Connell then appointed a Career and Technical Education (CTE) Advisory Group to develop the standards and frameworks. Classroom teachers, school administrators, parents, postsecondary educators, and business and industry representatives participate on the 47-member advisory group.

The standards emphasize both academic and technical skills. For example, two of the

standards for students enrolled in environmental engineering programs are the following:

- Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents. (This is part of the state’s math standards.)
- Use global positioning systems equipment and related technology to locate and evaluate soil or geological conditions or features. (This is specific to environmental engineering.)

The State Board of Education adopted the standards in May 2005. The CTE Advisory Group expects to release curriculum frameworks in spring 2006. To view the curriculum standards and monitor progress on the frameworks, visit: www.cde.ca.gov/ci/ct/sf/

A variety of programs exists in California

Many high school students participate in a formal course of study related to a specific career/tech education path. In 2003–04, according to the California Department of Education, 42% of high school students were identified as career/technical education concentrators because they were taking courses beyond the introductory level. In addition, many more students take an occasional career/tech class each year because its hands-on nature provides an interesting break in the day and teaches skills of interest. Most comprehensive high schools still offer a range of these elective classes, including traditional courses, such as cooking or wood shop, as well as newer classes, such as computer programming, business law, or film production. Such courses are a significant and popular part of the typical high school’s schedule.

California schools receive state and federal funds that encourage both these individual classes and coordinated career/tech programs. Total support in 2004–05 was approximately \$447 million. The state provided \$387 million for programs described below. Federal funds came largely through the Perkins Act, with \$48 million going directly to programs operated by high schools and \$11.5 million to Tech Prep programs, which are described later in this report.

Outside of the K–12 system, a wealth of other programs are available—offered through community colleges, private institutions, apprenticeships, and web-based career/tech

programs. Many of these require that a student first complete high school.

Most of the state’s career/tech investment lies in regional centers

The oldest and largest program in the state is the Regional Occupational Centers and Programs (ROCPs). They were created in 1967 as a way to serve students on a regional basis mostly because of the expensive equipment needed for some programs. ROCPs include centers at off-site locations serving students in a particular region as well as programs that operate both out of centers and high school sites statewide. ROCPs are available in more than 100 different career areas as diverse as forensic science, engineering, manufacturing, technology, automotive technology, graphic design, digital pre-press, and health-care. They offer high school students—and some adults—career education, advanced training, and courses to upgrade skills as well as counseling/guidance services and placement assistance. High school students frequently spend part the school day in a traditional academic program and the other part focusing on a vocation—either in a program offered at their high school, a regional center, or industry site, such as a hospital or automotive dealer.

By law, ROCPs must offer courses that meet the current labor market demand. They work with public agencies, businesses, and industry to design and provide programs that will meet local needs for skilled workers. More than 18,000 business and industry representatives statewide monitor the ROCP curricula. With their input, course content is updated annually to ensure the curricula stay current with industry demand.

During the 2003–04 school year, 74 ROCPs served approximately 336,000 or about 37% of California’s high school students age 16 and older. Of those students, 45% were female and 55% were male. In addition, ROCPs provided classes to about 165,000 adults, bringing their full enrollment to more than 500,000 students.

According to the California Association of Regional Occupational Centers and Programs (CAROCP), enrollment was highest in business/information technology programs and in industrial/technology education. In addition, more than 630 ROCP courses are approved for

college credit by community colleges and universities.

In 2004–05 the state’s ROCPs received \$364 million in state funds, which support both high school and adult students. Funding is allocated based on the number of full-time-equivalent students (FTEs) who attend the programs, but data is unavailable on how many FTEs are high school students. (Some students attend only one class.) The 74 ROCPs operate under one of three organizational structures: 43 are governed by county offices of education; 25 by a joint powers agreement among districts; and six by an individual school district.

School-to-career programs take a different approach

While vocational programs that started decades ago (such as the ROCPs) have moved to integrate academics into their instruction, a separate movement was founded specifically focused on this idea. This concept gained momentum with the 1994 passage of the federal School-to-Work Opportunities Act (mentioned above). Many saw this approach as holding great promise for reforming comprehensive high schools. When the standards movement took hold though, attention was diverted and funding for school-to-work practically disappeared. The programs that survived the transition are small and scattered throughout the state—receiving just 8% of the funding provided to career/tech programs serving California high school students.

School-to-work—or school-to-career as it is commonly called in California—generally refers to three different types of instructional programs: Career or Partnership Academies, Tech Prep programs, and general school-to-career activities. Some local programs operate on high school campuses and some at ROCs. Both Career Academies and Tech Prep are seen as models for how technical and academic courses might be integrated to provide the best results for students.

Career Academies focus on a particular career area, such as health or computers. Students work with the same group of teachers over a number of years, focusing on both academics and job skills. The goal is to prepare students for college entrance and for work success. Corporations or business organizations often sponsor and participate in these academies,

which generally are configured as a “school within a school.” While these types of programs began in Philadelphia as early as 1969, they did not start in California until the 1980s. The career/tech component of these programs is generally offered through ROCPs. In 2004–05 the state provided a total of \$23 million to support 269 Career Academies.

Tech Prep programs also attempt to integrate academic and technical education. These programs combine two or more years of high school education with two years of post-secondary education in an attempt to prepare students for higher-wage employment and/or further education. In 2003–04, 80 Tech-Prep consortia of high schools, community colleges, ROCPs, business, and industry were operating in California—though the programs are almost exclusively administered by the community college districts. The program—supported by Perkins Act funding—received about \$11.5 million in 2004–05.

From 1994 to 1999, the federal School-to-Work Act also provided California schools with \$130 million to support the development and operation of general school-to-career programs, such as internships, co-ops, and school enterprises (students producing goods or services and selling them to others). The legislation was not reauthorized, however. Except for a \$7.2 million supplement in 2000, federal funds were no longer provided. While the state provided \$1.7 million in 2003–04, the following year it provided none. Many local schools now must scramble to find financial support at the local level if they wish to continue offering these programs.

Efforts to change create controversy and challenges

Even as state and federal leaders debate the merits and challenges of providing quality career and technical education to high school students, educators are already exploring how academic and technical skills can be more fully integrated into their classes and programs. As changes in policy and practice continue to evolve, many questions are likely to emerge.

A central issue is how effective current programs are, both in terms of engaging students and helping them master high-level skills and knowledge. What works and what

Career/tech course enrollments decrease at high schools but increase at ROCPs

According to the California Department of Education, career/tech course enrollments decreased from 952,000 in 1987–88 to 691,000 in 2003–04. This occurred even as the total number of students enrolled in grades 9–12 increased by more than 560,000 students during the same time period. Meanwhile, high school student enrollment in California Regional Occupational Centers and Programs (ROCPs) increased from 205,000 to 336,000 from 1991–92 to 2003–04.

A typical day for a career/tech student

Career/tech classes are offered both at high schools and off-site. EdSource visited the Eden Area Regional Occupational Program (EAROP) in Hayward, California. Students enrolled at the center spend part of the day at their high school, taking traditional classes and eating lunch with their peers. A bus takes them to the site where they may attend one class, or a series of classes in one program.

Students interested in becoming carpenters might enroll in a Construction Technology program to learn about power tools, project planning and layout, blueprint reading, and other areas. They build model houses—some the size of a dollhouse—as well as a larger one the size of a child’s playhouse. Building the structures helps them master practical skills, such as hammering while standing on a house’s roof. Students use math skills extensively, including trigonometry when they calculate measurements and scale projects up or down.

does not work? While some career and technical education is provided in coherent programs of study—often at ROCPs—a large portion are single-class “enrichment” electives taught at local high schools. Community colleges provide other programs. Those variations in delivery make evaluation of existing programs complex. Quality, rigor, and relevance for

figure 1 | Career and Technical Education Programs in California

	Career and Technical Education (at a high school site)	Regional Occupation Centers and Programs (ROCPs)	School-to-career Programs		
			General School-to-career	Career or Partnership Academies	Tech Prep
Program Description	Electives or comprehensive programs offered at a high school site	Vocational training and placement at occupational centers and high school campuses	Internships, co-op programs, school enterprises where students start and run businesses	“Schools within schools” that focus on an occupational area and integrate academic and technical education; three-year programs for grades 10–12	Integrates vocational education into a two-to-four-year high school curricula and then extends into a two-year college or post-secondary certification program
Program leads students to:	A more comprehensive ROC program or a trade, career, or higher education institution	A trade, career, technical, community college, or other higher education institution	A career or higher education institution	College entrance and work	Associate degree or certificate in a specific field
2004–05 Funding	Federal: \$48 million (Perkins Act)	State: \$364 million for high school and adult students (General Fund)	State: None	State: \$23 million (General Fund)	Federal: \$11.5 million (Perkins Act)

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students may depend on the class or program. Examining all the current program options and venues will be important for state and local decision making.

The state’s new content standards and curriculum frameworks for career/tech could also make a substantive difference in course content and academic rigor. But the task of integrating academic content into career/tech programs is easier said than done, presenting not only instructional challenges, but also practical ones. For example, if career/tech instructors are not qualified to teach the academic content, what are the most effective ways for them to work with other instructors to integrate the curricula? What would it take to encourage technical and academic teachers to collaborate in such a way? To what extent will the historical divisions between the two factions impede collaboration? How can successfully integrated programs be widely replicated?

Others ask if such a marriage between academic and career education is even possible.

Further, where should the momentum for any changes in career/tech come from? As with so many education reforms, Californians will need to balance state and federal policies that demand change against the need for local flexibility. Will a more rigorous approach to career and technical education require additional resources or just better use of the funds already available?

Finally, given that career and technical education is offered not only in high schools, but also in ROCPs and at community colleges, better coordination between the various entities and programs could be crucial in improving outcomes for students. What needs to be done to ensure that students learn early on about technical career options and the academic path they need to follow to pursue them? What information do students need to clarify their options

beyond high school? What new partnerships and configurations among high schools, ROCPs, and community colleges might hold promise? And what obstacles to better cooperation and alignment need to be addressed?

The discussion about these California programs is part of a much larger question: Can the state improve the success of high school students generally, particularly the 75% who currently do not fulfill the entrance requirements to attend a four-year public university? Career and technical education is an important but increasingly neglected part of high school instruction today. Any effort at high school reform should include serious consideration of its value and its role. [ii](#)

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