



Transforming Today's Education for Tomorrow's Economy

New Directions for Career and Technical Education in California

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There is no greater challenge for public policy in California than preparing all our young people for lasting success in further education, career, and civic affairs. Success with virtually every other policy objective affecting the future of our state—be it economic growth, environmental protection, increased health and safety, renewed infrastructure, or a marked increase in the overall quality of life in the state—will depend on effectively delivering the knowledge and skills that young Californians need to live and work here productively.

Career and technical education (CTE) can play a vital role in helping to prepare many more of California's young people for lasting success in the state's economy. But we should be careful not to focus our attention just on CTE or limit our vision of CTE to a relatively narrow set of occupations and future possibilities for young people. There are at least three compelling reasons for thinking more boldly and comprehensively.

First, in high school, CTE accounts for no more than four or five courses in the twenty-four or so that students must take to earn a diploma. No matter how much we improve CTE, unless we find ways to make core academics more relevant and engaging for high school students, we are not likely to reduce drop out rates or raise the proficiency of an equally large number of students who earn a diploma poorly prepared for further education and work.

Second, in addition to promoting technical proficiency, we must raise academic achievement. Whether one is a highly skilled machinist, automotive technician, dental hygienist, production manager, loan officer, electrician, environmental safety technician, or engaged in one of many other high skill, high wage occupations in today's economy, it is simply no longer possible to get by with basic levels of proficiency in mathematics, science, English, and social studies. More and more, the academics needed for postsecondary education are the same as those needed for work.

Third, while succeeding in a high skill, high wage economy will not require everyone to have a four-year postsecondary degree, the likelihood of succeeding with just a high school diploma is diminishing rapidly. CTE, therefore, like the rest of high school, must be designed to prepare students for *both* postsecondary education *and* career, not just one or the other.

How do we craft a new vision that captures the power of CTE to engage students and motivate them to achieve higher levels of both academic and technical competency? We can begin by using

public policy to promote development of comprehensive, multiple pathways that simultaneously prepare students for career and the full range of postsecondary options—two- and four-year college, apprenticeship, the military, and formal employment training. These pathways, combining challenging technical courses with rigorous academics and spanning four years of high school, are organized around the state’s major industry sectors—agriculture and natural resources, arts, media, and entertainment, business and finance, biomedical and health science, building and environmental design, information technology, engineering and design, hospitality and tourism, and manufacturing, to name just a few. Each pathway—ideally spanning grades 9 through 12—includes not only challenging technical courses but also core academics redesigned to help students understand how mathematics, science, social studies, and language arts are used in the industry that is the organizing theme of the pathway.

Pathways Integrating CTE and Academics: An Illustration

Let’s be concrete. In a pathway organized around building and environmental design, a geometry class teaches the concepts and skills needed to build roofs and frame walls that withstand gale force winds, or a pre-calculus class stresses the role of mathematics in designing and building a seismically sound Bay Bridge. History helps students better understand how the built environment reflects and shapes daily life. An English class not only emphasizes the importance of mastering strong technical reading and writing but also helps students appreciate relevant literature, such as Pulitzer Prize winner Tracy Kidder’s *House*, a compelling non-fiction account of building the American dream.

Technical courses in this pathway include instruction in carpentry, electricity, masonry, and heating, ventilation, and air conditioning, but they also introduce students to fundamental principles of engineering and design, project and site planning, construction management, and emerging technologies. Where appropriate, these technical courses prepare students for certification in specific job-related areas (e.g., phlebotomy, computer network technician, or ASE automotive technicians), but they also provide broader technical knowledge and skill needed for lasting success and advancement in any industry or career.

Work-based learning is also an integral part of the pathway, offering students opportunities for mentoring and job shadowing, as well as intensive internships, apprenticeship, and school-based enterprise. Good work-based learning is much more than just work experience. It delivers structured learning at the work site and connects work-based learning to closely related instruction in the school classroom.

Finally, there is serious attention to the supplemental services, especially additional instruction in reading and mathematics, that many high school students need to succeed in a program that expects them to master high levels of both academic and technical knowledge. Anything less is simply setting up students to fail—in school, to be certain, but also in an economy that demands ever higher levels of knowledge and skill to earn a decent living.

The great promise of CTE, strongly connected to mainstream academics, is that it can finally make learning real and exciting for the thousands of students who are bored with the conventional high school curriculum. By joining academics with technical education, students finally begin to understand: “Why do I need to know this?” And this is as true for young people who aspire to be doctors, architects, and engineers as it is for those who want to be nurses, contractors, carpenters, and technicians.

A Foundation on Which to Build

The California Department of Education, in collaboration with industry representatives, has adopted content standards and program frameworks, for 15 industry sectors that, taken together, embrace the full range of activity in the California economy. The content standards included both challenging technical knowledge and relevant academics, providing sound direction for curriculum development and more focused preparation for teachers and administrators. The 15 sectors are:

- Agriculture & Natural Resources
- Arts, Media, & Entertainment
- Building & Environmental Design
- Business & Finance
- Education & Child Development
- Energy & Utilities
- Engineering
- Fashion Design, Mfg., & Production
- Health Sciences & Medical Technology
- Hospitality & Tourism
- Information Technology
- Manufacturing
- Public Services
- Transportation

Although multiple pathways in each of these sectors are hardly the norm in California’s high schools, they are beginning to emerge. In places like the Construction Technology Academy at Kearny High or High Tech High School in San Diego, the Health Careers Academy at Palmdale High School or Health Professions High School in Sacramento, the Manufacturing Production Technology Academy at Laguna Creek High School, or the Media Academy at Grover Cleveland High School in Los Angeles, students routinely connect their core academic classes to challenging CTE instruction.

Today in California, there are 290 Partnership Academies organized around one of the state’s fifteen major industry sectors, and there are approximately another 300 or so career academies. Regional occupational programs (ROPs) play an important part in many of these academies, and in still other high schools, ROP programs are experimenting with innovative approaches to integrating academic and technical education. The East San Gabriel ROP, for example, is one of the leaders in developing

CTE courses that satisfy one or more of the “a to g” requirements for admission to the University of California and California State University.

Twelve Policy Strategies for Transforming CTE

While these and other high schools like them represent a significant foundation on which to build a new initiative integrating CTE and academics, they nevertheless presently serve less than 10 percent of California’s high school students. And, of course, enrollments in more traditional ROP offerings and other forms of CTE have been stable or declining during the past decade. What, then, are the policy priorities for ensuring that all of the state’s young people have access to new multiple pathways preparing them for both postsecondary education and career? Here are twelve recommendations for moving forward aggressively on multiple fronts.

1. *A Comprehensive Vision for Policy:* Align state education policy—affecting standards, assessment, curriculum, postsecondary articulation, accountability, professional development, teacher preparation, and finance—to promote development and universal access to multiple pathways integrating preparation for both postsecondary education and career. Specify that a comprehensive pathway consist of at least four key components:
 - a. An academic core enabling students to meet the minimum academic course requirements for admission into the University of California and California State University, which will also reduce the need for remediation in the Community College system;
 - b. A technical core, consisting of no fewer than the equivalent of four year-long courses focused on the knowledge and skill needed for career preparation in a major industry;
 - c. A series of increasingly challenging work-based learning opportunities, beginning in the 9th grade with such activities as mentoring and job shadowing and culminating in 12th grade with intensive internships, school-based enterprise, or virtual apprenticeship;
 - d. Supplemental services, especially additional instruction in reading, writing, and mathematics.
2. *Model Pathways:* Building on the state’s academic and CTE standards, develop model comprehensive pathways for each of the 15 industry sectors that are the organizing framework for CTE in California.
3. *Industry Partnerships:* For each of the 15 industry sectors, create an Advisory Panel comprised of industry representatives, secondary and postsecondary educators, policymakers, and other interested individuals to advise on Pathway design, further refinement of academic and technical content standards, curriculum development, assessment, and teacher preparation.
4. *Model Curriculum:* Support development of model curriculum in each of the 15 sectors that infuses high-level academics into core technical courses and authentic application into core academic courses that constitute the program of study in each industry-focused pathway.

5. *Teacher Credentialing*: Develop an innovative and coherent system of credentialing for academic and technical teachers in each of the 15 sectors that recognizes the complementary knowledge, skills, and experience required of a team of academic and technical teachers working together to deliver integrated academic and technical instruction in a particular pathway.
6. *Professional Development*: Promote professional development that builds capacity 1) among existing CTE teachers to recognize, reinforce, and supplement key academic concepts and skills that are particularly well-suited to the industry that is the pathway’s organizing theme and 2) among existing academic teachers to apply their particular academic discipline to authentic problems and projects in the industry; develop model teacher preparation programs for training new academic and technical teachers who will teach in multiple pathways.
7. *Work-based Learning*: Encourage industry/school partnerships that provide students with a range of work-based learning opportunities, closely coordinated with classroom instruction and teaming teachers with industry experts.
8. *School Organization and Scheduling*: Through policy and technical assistance, support high schools seeking to create pathways using “schools-within-schools” and other forms of small learning communities; provide assistance in reorganizing the school day around “block scheduling,” 7- and 8-period days, and other strategies to ensure that there is sufficient time for students to take the full complement of courses needed to pursue both postsecondary education and career.
9. *Postsecondary Articulation*: Promote more uniformity and consistent quality in articulating secondary programs of study to postsecondary majors and other programs in two- and four colleges, apprenticeship, the military, and other recognized formal employment training opportunities.
10. *Assessment*: Develop valid, reliable, and fair assessments of “work-readiness” that, in addition the state’s current academic testing, provide evidence of students’ mastery of appropriate technical knowledge and skill, including proficiency in applying academic knowledge to challenging, authentic work-related problems and projects.
11. *Accountability*: Expand high-stakes state accountability measures, such as the API, to include measures of work-readiness, aligned with continued postsecondary preparation.
12. *School Finance*: Realign the state’s procedures for financing CTE—e.g. funding for ROP/C, California Partnership Academies, earmarked funding for CTE facilities and equipment, and the allocation of federal funds under the Carl Perkins Act—to support expansion of multiple pathways and the other policy priorities outlined above.

It is time to end the rigid separation of CTE from challenging academic preparation, in California’s high schools as well as in our postsecondary institutions. By crafting a bold new vision that connects CTE to core academics for all students, we can create comprehensive multiple pathways that make

success in both postsecondary education and career attainable goals for all of California's young people. Realizing that success is essential to a thriving California economy, today and tomorrow.

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