

CHAPTER THREE

BUILDING A HIGH-QUALITY CTE SYSTEM: A VISION FOR THE FUTURE

California is at an important crossroads as it continues to strengthen and expand the delivery of CTE and the skills of the California workforce. New demands from the 21st century workplace and rapid globalization, shifts in the state's demographics including immigration and baby boom retirements, and pressures to improve outcomes for K-12, adult school, and community college students are creating a new urgency for increasing the pace of CTE reform begun in previous decades. Education must keep pace with the realities of a changing world.

Many new priorities are reflected in the new Carl D. Perkins Career and Technical Education Improvement Act of 2006, as described in the Introduction to this document. In California, given vast regional differences and powerful economic and demographic forces, completion of high school and ongoing training or education has become essential to individuals' economic security and quality of life. With support from the current Governor and many other policymakers, California intends to leverage Perkins-funded efforts to improve the entire CTE system — to move toward a more coherent, world-class delivery system that serves as the primary engine for the state's workforce and economic development, **and as a key vehicle for engaging students in learning.**

The state's shifting economy has created a need for new knowledge, skills, and attitudes in the workplace. Employers view such skills as communication, critical thinking, problem solving, and teamwork as essential prerequisites for work. They also want employees with basic academic knowledge and skills, a high school or college degree, and appropriate levels of training or certification in their respective industries. Equally important, individuals must be self-motivated and able to continuously learn, as well as manage their careers, in response to ongoing and increasingly rapid change.

These skills are essential to success for all working adults, whether artists, scientists, nurses, or carpenters. They are, further, essential to society in addressing the challenges posed not only by a changing economy, but a changing world. CTE can therefore no longer continue to exist as a separate educational alternative; it must be integrated into the very fabric of our educational delivery system. CTE — with its focus on rigorous and relevant content, hands-on learning, supportive relationships, and demonstrated outcomes — can set the standard for the kind of challenging, engaging, student-centered instruction that we know is required for students of all ages to succeed. Integrated thoughtfully with the arts, humanities, and sciences, and guided by basic principles of youth and adult development, CTE can complement and enhance learning in all disciplines, reinforcing rather than compromising the tenets of a liberal arts education, while preparing students for their future endeavors.

In this spirit, the resource group used the development of the California Perkins Plan as a point of departure to envision an overall statewide CTE system that can engage and prepare students of all ages for fulfilling careers and lifelong learning, while addressing the workforce needs of the new economy. **Policymakers and other stakeholders from across the state, including representatives from K-12, adult school, and postsecondary education as well as business and industry, developed a conceptual framework for moving toward this ideal CTE system.** The framework (including a vision, mission statement, set of guiding principles, and goals and recommendations) therefore provides both the scaffolding for the state Perkins plan and a

blueprint for strengthening CTE overall.

Vision

The vision for California's CTE system describes where the state wants to be in the future and is intended to **set the stage for inspiring actions to build a new system.**

CTE will engage every student in high-quality, rigorous, and relevant educational pathways and programs, developed in partnership with business and industry, promoting creativity, innovation, **leadership, community service, and lifelong learning**, and allowing students to turn their "passions into paychecks" — their dreams into **careers.**

Mission

The mission statement defines the role of CTE in propelling the state toward its vision.

The mission of CTE is to provide industry-linked programs and services that enable all individuals to reach their career goals **in order to achieve economic self-sufficiency, compete in the global marketplace, and contribute to California's economic prosperity.**

Guiding Principles

The guiding principles provide direction for CTE planning and implementation aligned to the mission and vision:

1. CTE is designed to increase education and career options for all students through career awareness, exploration, and occupational training programs.
2. CTE is deliberately intended to be available and accessible to all students, **including students seeking immediate employment and those seeking higher education**, students learning English, and students facing diverse challenges to economic success.
3. CTE is uniquely linked to the world of work, and requires the direct participation of, and partnership with, business, industry, and labor to maximize program quality and work-based learning opportunities for all students.
4. CTE programs are based on locally validated industry standards and curricular content, are responsive to labor market conditions, and provide all students with transferable skills necessary for success in future occupations.
5. CTE integrates academic and technical skills to maximize all students' educational and career outcomes.
6. CTE provides opportunities for applied, contextual learning that increases student engagement and supports improved achievement for all students.

7. CTE offers integrated curricula through sequenced courses, in multiple pathways, bridging educational segments, which prepare all students for both further education and career entry.
8. CTE programs develop student leadership, career management, and entrepreneurial skills.
9. CTE is dependent on comprehensive career guidance systems (K-16 and beyond) that inform and connect all students with the best possible career technical education opportunities.
10. CTE provides students, including incumbent workers, with instructional programs for employment and success in postsecondary education, as well as lifelong learning opportunities to maintain or upgrade their technical knowledge and skills.
11. CTE requires highly prepared instructors, administrators, and staff who are supported by sustained, high-quality, and relevant professional learning, including preservice, inservice, and ongoing professional development.
12. CTE is sustained through ongoing state, federal, and local investments, based on student participation and proven labor market and local workforce needs, that provide funds and resources to ensure CTE programs have modern industry standard facilities, equipment, instructional materials, and competitively paid CTE instructors.
13. CTE is accountable through measuring and reporting student course participation, completion of CTE courses and pathways, student and program certification, transition to postsecondary education, completion of postsecondary certificates and degree programs, short-term and long-term employment outcomes, and other measures necessary to ensure program quality.

Career Technical Education System Goals

Consistent with the vision, mission, and guiding principles presented above, the CTE resource group developed the following system goals that will guide CTE in California through 2013-14. The following goals provide direction for establishing objectives that are realistic, attainable, timely, and measurable:

1. All students completing high school will be prepared for success in postsecondary education — including community colleges, four-year colleges, apprenticeships, adult schools, trade schools, military, or other education and training programs — *and* for employment and long-term careers.
2. Adults in California will be prepared with the skills and knowledge necessary to reach their career goals and maintain economic self-sufficiency through access to information, guidance, support services, and educational opportunities offered in adult schools, ROCP, and community college programs.
3. Every student will complete a rigorous CTE course or pathway prior to graduating high school.

4. Age appropriate career guidance information and experiences will engage all students throughout their K-14 educational experience in exploring, planning, managing, and reaching their education and career goals.
5. All CTE courses and programs will be based on industry-endorsed standards, and designed to assist students in acquiring employment readiness and career success skills.
6. All CTE courses and programs will meet documented labor demands, including new and emerging occupations.
7. Statewide programs of study, dual enrollment, articulation of coursework, and related processes will be established to facilitate smooth student transitions from middle school to high school, and beyond, to postsecondary education and training.
8. Business, industry, and labor participation will be incorporated into all components of the CTE system at the local, regional, and state levels.
9. CTE teacher preparation programs and sustained professional development will be substantially expanded to ensure an adequate supply of highly prepared instructors necessary to meet student needs. All teachers will have the skills necessary to provide rigorous and relevant instruction among all industry sectors and educational levels to meet diverse student needs.
10. Comprehensive data collection systems will be developed and coordinated to ensure ongoing program improvement, program accountability, system outcomes, and research.

Achieving these goals requires focused attention and strategic investments in both the CTE system overall and its component parts, at the state, regional, and local level.

The 11 Elements of a High-Quality CTE System

High-quality CTE encompasses 11 key elements, identified through the CTE needs assessment and resource group meetings:

- Leadership at all levels
- High-quality curriculum and instruction
- Career exploration and guidance
- Student support and student leadership development
- Industry partnerships
- System alignment and coherence
- Effective organizational design
- System responsiveness to changing economic demands
- Skilled faculty and professional development
- Evaluation, accountability, and continuous improvement
- CTE promotion, outreach, and communication

In addition, as mentioned in the Introduction, key themes are infused throughout the elements:

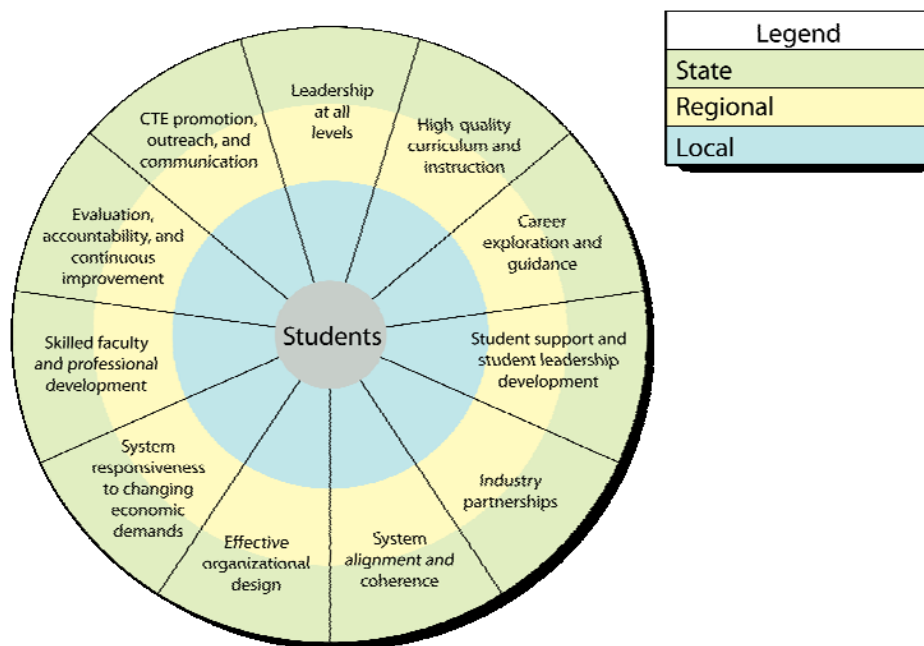
- Building a demand-driven CTE system by responding to real workforce development needs and state, regional, and local labor market priorities, through strengthened curricula, professional development, data collection and use, and linkages with business, industry and education
- Ensuring access for all students to CTE courses, pathways, and programs of interest; to highly-skilled instructors; and to facilities and technologies that make all CTE options available regardless of location and enrollment limits
- Fully realizing the concept of lifelong learning, spanning from early childhood through adulthood's many transitions, in ways that promote career awareness and management as appropriate throughout the continuum, and that address rigor and relevance as well as instilling a passion for learning
- Leveraging the current momentum of high school reform, with its renewed focus on rigor, relevance, relationships, and results, to promote CTE as a means to improve student outcomes
- Viewing CTE systemically by taking a broad perspective in planning for how CTE from kindergarten through lifelong learning can contribute to California's economic future rather than focusing on discrete secondary or postsecondary programs or specific funding streams
- Promoting the continuous improvement of CTE services and impact through the alignment of standards, curricula, assessments, and professional development as well as support for local agencies in achieving performance goals for students' academic and technical skill attainment

The 11 elements are intentionally aligned with the principles developed by the CTE resource group, and also feature prominently in Perkins IV. All must be present to ensure that California can realize its goals of preparing all students for the future and ensuring a strong economy. In addition, these components define high-quality CTE at the regional and local level and are further mirrored in individual "programs of study" as defined by Perkins IV, or career pathways that may be implemented in specific schools and colleges. In other words, CTE is a system that requires leadership, high-quality practice, coherence, skilled practitioners, and accountability at all levels.

Implicit in the concept of levels of activity is the issue of division of responsibility among agencies at different levels. In all of the areas of CTE activity, there exists a dynamic tension or interplay between the need for local control and the need for state oversight. This interplay is evident in each of the areas of activity described below and must be addressed at each stage of system development to ensure the most effective and efficient use of resources.

Figure 8 depicts CTE as a system that nests local activity within regional and state-level work, with each of the system elements operating at each level.

Figure 8. CTE as a system that nests local activity within regional and state-level work



To achieve the CTE goals stated above, the specific responsibilities appropriate to each level must be clearly delineated and resources designated accordingly. Local and regional activities are supported through state apportionment and grant dollars, including Perkins funds and SB 70 funds. At the state level, the CDE and the CCCCOC must also be supported to exercise the leadership required to further develop and expand CTE for the benefit of all students.

What follows is a description of each of the system elements. Each description includes a definition of the element, a brief overview of current key activities, and a discussion of critical strategies required to move the system forward in that area. As with any system, the elements are interrelated. Therefore, while every attempt has been made to define each element as a discrete category of activity, in some cases, the associated strategies appear in several categories.

Leadership at All Levels

Institutional commitment and leadership at every level, including the institutions' governing boards, are vital to sustaining and expanding CTE. As in any system, effective leadership is needed to articulate and spotlight the need for CTE, galvanize support and resources, ensure sound management and coordination, and facilitate continuous improvement.

Definition and Significance

Leadership structures for CTE have changed significantly over the last 20 years, due to changing educational policies and enrollment levels. In addition, the K-12, adult school, and

community college systems have differing leadership structures, reflecting each system's unique mission, requirements, and cultures. As stakeholders seek to build a more unified workforce development system, including seamless pathways that prepare all students for further education and careers, better alignment and coordination are paramount. This suggests that leadership structures in both systems may also need further support and alignment.

Current Key Activities and Initiatives

Leadership for CTE resides at all levels — state, regional, and local — in the K-12, adult school, and community college systems. Aligning efforts across systems to create seamless pathways requires a chain of leadership from the state to the classroom.

State Level Leadership

Currently, as described in Chapter One, CTE is overseen at the state level by the Joint Advisory Committee for CTE, consisting of three representatives each from the State Board of Education, representing the K-12 system and adult schools, and from the Board of Governors, representing the California Community Colleges. In recent years, the Governor, the State Superintendent of Public Instruction, and the Chancellor of the California Community Colleges have shown renewed interest in CTE, in recognition of the importance of career preparation and workforce development and of the role that CTE can play in student engagement and academic achievement.

Within CDE, the major responsibility for CTE resides in the Secondary, Postsecondary, and Adult Leadership Division (SPALD). The Director of SPALD also serves as the State Director for CTE. SPALD provides support and direction to LEAs regarding high school initiatives, educational options, ROCPs, adult schools, postsecondary preparation, and workforce development.

Additionally, division staff — called “subject matter specialists” — provide support and technical assistance to local agencies in the six major career areas that encompass all of the 15 industry sectors currently delineated in the CTE Model Curriculum Standards, described in greater detail in Chapter One.

Leadership and support from CDE has enabled CTE faculty to develop standards-based integrated curricula, including “a-g” approved courses, and to implement model practices. The foundations laid with this technical assistance have also facilitated the creation of related career academies and other integrated programs in many high schools. CDE leadership in the career areas has also supported development of career technical student organizations (CTSOs). Leadership and technical assistance to the field are considered particularly important in CTE because CTE curricula must be updated frequently to respond to the changing needs of industry, limiting CTE instructors' ability to rely on textbooks or standardized materials in their classrooms.

In the community colleges, leadership for CTE resides with the Vice Chancellor for Economic Development and Workforce Preparation. The Vice Chancellor oversees the Economic and Workforce Development (EWD) unit and the Career Technical Education unit, each of which is led by a dean.

The Economic Development and Workforce Preparation Division (EDWPD) of the CCCCO provides leadership and technical assistance to enhance the capacity of the community colleges in the areas of career education and workforce and economic development, including implementation of the California CTE State Plan.

The role of the EWD unit is to coordinate efforts in the community colleges to fulfill the needs of business and industry for a skilled workforce. The unit facilitates the community colleges' work with employers, advisory committees, and agency partners to identify — on a region-by-region basis — workforce education and training needs, including the needs of small businesses, and then to meet those needs in the most cost-effective and timely manner.

The Career Technical Education unit of the EDWPD focuses on program coordination, advocacy, and policy development with the K-18 workforce preparation and CTE systems. The CTE Unit is responsible for the community colleges' implementation of the Perkins Act, as well as for the development, dissemination, and implementation, with CDE, of the California CTE State Plan, and the preparation of annual performance reports.

The California Community Colleges' Academic Senate, within which CTE is fully represented, also plays a vital role in all statewide and local academic and professional matters. It develops, promotes, and acts upon policies responding to statewide concerns and serves as the official voice of the faculty of California Community Colleges in academic and professional matters. The Academic Senate strengthens and supports the local senates of all California community colleges.

The CCCCO has established ten advisory committees, focusing on either discipline-specific (also called "subject"-specific) or cross-disciplinary issues, to ensure a process for direct linkages between faculty and administrators with representatives from business, industry, and labor on a statewide basis, as described in Chapter One. Recommendations from the advisory committees to the CCCCO have evolved over time into ongoing statewide discipline-industry and special project collaboratives that mirror the advisory committee structure. Despite the recognition at all levels that subject matter specialists are vitally important and needed to ensure effective linkages and technical support with field practitioners, state operation funds are not sufficient in either the CDE or the CCCCO to make this a reality. In the past, such leadership was supported by Perkins funds, but reduced funding allocations for state operations have restricted the support available.

Regional Level Leadership

A variety of K-12 programs and initiatives as well as professional development offerings are delivered statewide using the 11 regional divisions of the California County Superintendents Educational Services Association (CCSESA). In recent years, CDE has worked with the CCSESA Curriculum and Instruction Steering Committee and the high school subcommittee to implement regional projects, including high school reform efforts incorporating CTE, campaigns promoting the integration of CTE and academic instruction, and support for the creation of networks of schools engaged in improving instruction.

Regional approaches are also used in the delivery of CTE technical assistance and services to LEAs. For example, Agriculture Education is organized in 6 regions, and ROCP services are divided into 5 regions. Home Economics Careers and Technology is arranged in 6 regions and Adult Schools serve 13 regions. Each of these has evolved to serve LEAs based on the numbers of programs and students, the needs and dimensions of the programs, and the

number of CDE staff available to support the regions. The Career Technical Student Organizations (CTSOs) are likewise divided into regions, with each having regional officers and competitions at the local, regional, and state levels. In addition, CDE works with other state agencies in delivering regional services, including the Employment Development Department, the California Department of Health, the Department of Developmental Services, and the California Community College System Office. These various regional structures have proven to be effective in supporting the large numbers of CTE programs and constituencies throughout California.

The community college system has a strong regional structure as well. Given the diversity of California's economy, the regionalization of industries such as agriculture, media, computer technology, and natural resources, and the state's geographic scope, the 109 community colleges have been divided into ten regions and organized into seven regional consortia. The consortia members "lead from the middle" by providing leadership to the colleges as well as contributing to statewide policymaking.

Each regional consortium serves as a network of education and training programs and services that bring CTE and economic development staff together for information sharing and problem solving. Supported with Perkins IV State Leadership funds, the regional consortia facilitate coordination and improvement of CTE programs and are a particularly effective and efficient structure for bringing statewide initiatives to the regional and local level through offering informational meetings, communication, training, and field-based feedback on an ongoing basis. Additionally, consortia services include, but are not limited to, ongoing assessment and regional/sub-regional planning, marketing, dissemination of information, collaborative exchanges, and coordination. The regional consortium is in a key position to promote collaborative partnerships and joint ventures among a wide range of business and industry partners.

Local Level Leadership

K-12 leadership in CTE at the local level generally resides with district directors of CTE, ROCP directors and administrators, and/or adult school directors and administrators. In earlier years, the size and scope of the CTE programs in the larger districts were sufficient to justify the appointment of CTE-qualified staff members to CTE director and program specialist positions at the district level and program department chair positions at the school level. In recent years, shifting priorities have impacted funding for these positions or resulted in realignment of resources. In addition, retirements of CTE instructors and the absence of new recruits to CTE faculty or administrator positions are creating "leadership vacuums" in some programs.

At the community college level, individual community college districts, colleges, and their respective academic senates exercise leadership in their local communities. Occupational deans manage CTE in each college, and many deans participate in regional consortia, statewide advisory, and discipline-industry collaborative meetings along with faculty leaders from individual program areas. The deans lead by working collaboratively with college and individual program advisory committees that include local business and community leaders, occupational faculty, and staff. Together they develop strategies and workplans to address the local priorities for CTE program and/or staff development and improvement.

Partners, including industry representatives, members of the business community, and colleagues in other sectors, also provide leadership in CTE — in both segments and at all levels — through advisory functions, advocacy, activities, and their own strategic initiatives.

In looking at the K-12 and community college segments side-by-side, the K-12 system has tended to exercise leadership primarily through a centralized structure, paralleling the overall approach of the CDE. The community colleges, by contrast, rely more heavily on a regional approach and local control, resulting in a form of shared governance, supported by a state-level advisory structure. The common use of the "system office" to refer to the Chancellor's Office reflects this strategy.

With increased emphasis on CTE and program improvement, investment in all levels of leadership is paramount. Further, given the importance of aligning the K-12, adult school, and community college systems, useful leadership structures from each segment can inform development in the other.

Needed Actions

The following strategies have been identified as critical to enhancing the leadership and development of CTE:

- Create a statewide CTE advisory committee for the K-12 system that meets and confers annually with the State Superintendent of Public Instruction to keep the Superintendent apprised of developments in CTE.
- Invest in statewide leadership development strategies that employ optimal combinations of staffing, advisory committees, and peer-to-peer learning opportunities to maximize each segment's capacity to provide high-quality leadership as well as support and technical assistance to the field.
- Allocate resources specifically to qualified "subject-matter" (career area) specialists at both the California Department of Education and the California Community College Chancellor's Office to provide leadership and facilitate communication and coordinate peer-to-peer learning, professional development, advocacy, and industry engagement efforts within their career area; to conduct and coordinate review processes for accountability purposes; and to provide subject-matter technical assistance directly to the field when necessary to strengthen program area instruction.
- Establish agreements with higher education to ensure that leadership in CTE is included within the courses of study required for administrative credentials.
- Strengthen regional structures for the K-12 system, aligned with the existing community college regional consortia.
- Invest in the professional development of administrators at all levels regarding the benefits of CTE and the management of CTE programs within the larger context of educational improvement to serve all students.
- Invest in support for CTE leadership at the local level to ensure that CTE administrators, coordinators, and counseling and instructional leaders have sufficient time and resources to implement system improvements and work with their counterparts in other programs.

- Develop and engage leadership at all levels of partner organizations to encourage bottom-up as well as top-down participation.

High-Quality Curriculum and Instruction

CTE is a unique curricular area in education. It offers rigorous integrated technical and academic content, focused on careers that are intrinsically interesting to students, and delivered through applied, performance- and project-based teaching strategies that facilitate understanding and mastery. It also instills essential transferable workplace and career management skills that students can draw upon over a lifetime of learning and career development. In addition, CTE is, by necessity, often taught in personalized learning environments — small classes, learning communities, student organizations, and worksites — that further augment the benefits of these programs. Finally, CTE programs are dynamic; curricula need to stay current with rapid changes in the workplace, requiring ongoing updates and learning on the part of CTE faculty.

High-quality curriculum and instruction in CTE includes the intentional reinforcement of the academic and technical rigor inherent in CTE and the alignment of CTE with academic and industry standards. It also includes the integration of CTE and academic content through a variety of strategies that foster complementary approaches to teaching and learning — strategies that draw on the best of what both CTE and non-CTE disciplines have to offer.

Definition and Significance

The importance of explicitly linking academic and CTE teaching and learning in ways that “increase student academic and career and technical achievement” is incontrovertible in Perkins IV. Explicit reinforcement of the academics embedded in CTE, and alignment of CTE with standards, can occur within a single CTE course. Integration of content across disciplines, by contrast, can take many forms and occurs most effectively through cross-disciplinary collaboration. It includes both the infusion of academic content and standards-based instruction into CTE courses and the incorporation of career themes, essential workplace skills, or work-based learning into academic courses. Given the complexity of the task, integration is facilitated by collaboration between CTE and non-CTE faculty, and among faculty and practitioners in the K-12, adult school, postsecondary, and business and industry sectors.

Integrated curriculum organizes the content of education in ways that cut across subject-matter boundaries and standards. The integration of CTE and non-CTE content is a strategy for increasing the rigor of CTE coursework and the rigor and relevance of non-CTE coursework. In other words, integrated curriculum is both academically and technically rigorous, providing students with opportunities to apply academic competencies in occupational tasks or career-related projects, and vice versa, leading to higher levels of both cognitive and technical skill. At the same time, it fosters student engagement and learning by helping students make the link between abstract theory and career-related interests.

The instructional strategies that support integrated curricula differ from conventional subject-matter instruction or the traditional CTE focus on technical skill development. They draw more broadly upon the essential transferable skills and attitudes that are the foundation of success in the workplace — problem identification, problem solving, self-regulation, teamwork, effective communication, follow-through, creativity, and confidence to make decisions, among others.

Linking the classroom to real-world work settings through work-based learning is another form of integration. Work-based experiences facilitate learning by promoting engagement, motivation, and relationships with adult professionals who model what is required to succeed in the workplace. Work-based learning, as well as other forms of integrated curriculum and high-quality CTE, accommodates various learning styles by teaching and assessing mastery in multiple ways, including the use of performance tasks. Finally, because standards of performance and behavior in the workplace are sometimes more rigorous than in classrooms, work-based learning can challenge students to achieve at higher levels.

With the expanded focus of CTE in Perkins IV covering programs that articulate to the baccalaureate level, and given the increased complexity of technical content in many career areas and the high rates of remediation for students entering the community colleges, integrated curriculum and instruction are increasingly applicable **not only** in community colleges, secondary CTE, and adult schools, **but also at the university level**, as a means to facilitate learning. Indeed, the importance of lifelong learning in a rapidly changing and often unpredictable world suggests that strong foundational skills, including academics as well as workplace competencies, are vital **to both postsecondary** and career success. High-quality CTE can provide this foundation.

In summary, high-quality CTE both incorporates academics and essential skills in its own curriculum and complements and enhances academic instruction delivered by other faculty. It highlights, reinforces, and strengthens academic content through learning activities that authentically represent the knowledge, skills, and attitudes needed to succeed in the workplace. Reinforcing academic skills through CTE allows students to assimilate knowledge in ways that are useful, interesting, and potentially remunerative, while building the technical skills that can lead to immediate or future employment.

Current Key Activities and Initiatives

California is committed to strengthening its CTE system through better alignment and integration of CTE and non-CTE curriculum and instruction at the K-12, adult school, and community college levels. It is directed to do so by Perkins legislation. It is also encouraged to do so in the California Education Code. In addition to the activities discussed below, “learning communities” that can facilitate CTE/academic integration have also been expanded; these efforts are further described under “Effective Organizational Design”, later in this chapter.

K-12 Activities

CDE policy, as codified in the California Education Code, stresses the importance of preparing all students for both postsecondary education and future careers. **The California Education Code in Section 51220 specifically requires that districts serving students in grades seven through twelve provide courses in “Applied arts, including instruction in the areas of consumer and homemaking education, industrial arts, general business education, or general agriculture”; and “Career technical education designed and conducted for the purpose of preparing youth for gainful employment in the occupations and in the numbers that are appropriate to the personnel needs of the state and the community served and relevant to the career desires and needs of the pupils.”** These are in addition to providing courses in English, social science, foreign language, physical education, science, mathematics, and visual and performing arts.

The Education Code also specifically addresses and emphasizes the importance of curriculum integration. It directs school districts to provide courses that prepare students both for admission to postsecondary education and for entry to employment, and encourages integration of the two, as follows:

Section 51228 (a):

Each school district maintaining any of grades 7 to 12, inclusive, shall offer to all otherwise qualified pupils in those grades a course of study fulfilling the requirements and prerequisites for admission to the California public institutions of postsecondary education and shall provide a timely opportunity to each of those pupils to enroll within a four-year period in each course necessary to fulfill those requirements and prerequisites prior to graduation from high school.

In Section 51228 (b):

Each school district maintaining any of grades 7 to 12, inclusive, shall offer to all otherwise qualified pupils in those grades a course of study that provides an opportunity for those pupils to attain entry-level employment skills in business or industry upon graduation from high school.

Section 51228 (b) then stresses the importance of curriculum integration:

Districts are encouraged to provide all students with a rigorous academic curriculum that integrates academic and career skills, incorporates applied learning in all disciplines, and prepares all pupils for high school graduation and career entry.

A number of policies, tools, and strategies have been developed to facilitate high-quality CTE curriculum and instruction in the K-12 system.

CTE Model Curriculum Standards and Framework. In recent years, the state has made significant strides in furthering high-quality CTE, most notably with the adoption of the CTE Model Curriculum Standards and Framework by the California State Board of Education in 2005 and 2006, respectively. The nationally recognized curriculum standards incorporate academic and workplace skills into the middle and high school curriculum for each of the 15 industry sectors. The standards include 11 foundation standards that students need to master to succeed at CTE and work:

1. Academics
2. Communications
3. Career Planning and Management
4. Technology
5. Problem Solving and Critical Thinking
6. Health and Safety
7. Responsibility and Flexibility
8. Ethics and Legal Responsibilities
9. Leadership and Teamwork
10. Technical Knowledge and Skills
11. Demonstration and Application

In addition, within each of the 15 sectors are 2 or more career pathways for a total of 58

pathways. The pathways are made up of coherent sequences of rigorous academic and technical courses that allow students to apply academics and develop technical skills in a given curricular area.

The CTE curriculum framework **provides guidance** for implementing the CTE Model Curriculum Standards. Written as a hands-on tool for education professionals and others with an interest in implementing a statewide standards-based CTE, the framework provides context for the content delineated in the foundation and pathway standards. It is specifically designed to facilitate the development of programs, courses, lessons, and assessments in CTE and provides information on important implementation issues.

CTE Online. Based on the belief that CTE serves a vital role in reinforcing academic skills through contextualized, applied instruction, the CTE Online Web site (www.cteonline.org) was established to help practitioners articulate a clear and deliberate relationship between academic achievement and CTE. The site connects CTE educators and leaders to professional development tools that help establish the role rigorous academic skills play in industry and career-related coursework. It provides all of the tools necessary to help faculty identify and align CTE curricula with the academic skills commonly measured on state assessments: curriculum development materials, guidance, model curriculum examples developed by a cross-section of CTE teachers from across the state, and standards databases cross-referenced to the Standardized Testing and Reporting (STAR) and the California High School Exit Examination (CAHSEE) assessment systems.

Alignment of CTE Curricula with Eligibility Requirements for UC/CSU Admission. Another approach to integration is aligning CTE courses with the rigorous standards required of college preparatory courses. Currently, more than **5,600** CTE courses have been approved to satisfy the eligibility requirements for admittance to the California State University and University of California system, commonly referred to as the “a-g” requirements. This is fewer than 20% of all CTE course offerings, and most of the approved courses are in three areas: visual and performing arts (53%), college-prep elective (30%), and laboratory science (16%). However, more classes are added each year, with the university systems and CDE offering guidance to CTE faculty about how to amend courses to meet the requirements. **Of note, support in the agricultural career area through the Agricultural Vocational Incentive Grant Program, authorized in 1983 by California Senate Bill 187, has facilitated the integration of CTE and academic curriculum, with the result that 842 agriculture courses meet UC/CSU “a-g” requirements.**

The Rigor/Relevance Framework. Secondary educators are also including contextualized and project-based learning in academic courses. One example, being implemented in 22 school districts in California, is the Rigor/Relevance Framework. Developed by the International Center for Leadership in Education, founded in 1991 by Willard R. Daggett, this framework assists educators in delivering instruction that facilitates integration of academic or cognitive skills with applied learning experiences, such as those offered by CTE programs.

California Resource Clearinghouse Library. Online tools and information about integrated curriculum can also be found at the California Resource Clearinghouse Library.⁸⁷ The California Resource Clearinghouse Library features a searchable database of materials such as books and videos that illustrate the relationship between classroom subject matter and real-world applications and help educators effectively develop integrated curricula. Resources are designed for use by faculty, staff, and partners in the K-12, adult school, and community college

⁸⁷ The California Resource Library, <http://www.ca-clearinghouse.net/>.

segments.

Work-Based Learning. Work-based learning is a key strategy for integrating academic and career technical education and ensuring that programs provide students the opportunity to meet high industry standards. Work-based learning, as described in Chapter One, is offered at the secondary level through Work Experience Education, ROCs, California Partnership Academies and other learning communities, and adult schools. Adult schools, ROCs, and Partnership Academies require connection of work-based learning to technical or academic classroom curricula, while Work Experience Education programs generally focus on career exploration and work readiness. Secondary students may also access work-based learning through local community college co-operative work experience programs.

Professional Development. Integrating academic subject matter and CTE often requires intensive professional development and “real-time” support for teachers who are typically not trained to combine content across disciplines. CDE staff with subject-area assignments, and county offices of education at the regional level, provide this support to teachers. In addition, CDE has conducted trainings in the implementation of the CTE Model Curriculum Standards and Framework and is planning ongoing training on the standards and framework overall and by industry cluster, using a train-the-trainer model, with the expectation that all CTE programs will implement the standards even though they are currently not mandatory. As described above, CTE Online also provides electronic access to professional development resources. Finally, CDE contracts with educational service providers for professional development.

Integration Efforts in the Community Colleges

The California Community Colleges’ mission in Education Code includes both academic and career technical education, as follows:

To offer academic and career technical education at the lower division level for both recent high school graduates and those returning to school and to advance California’s economic growth and global competitiveness through education, training, and services that contribute to continuous workforce improvement.

While CTE at the community college level is currently most often designed to lead to immediate employment, there is increasing recognition that basic academic skills are required for all occupations, and that integrating CTE with “developmental education” courses holds promise for advancing the academic skills of many students, while providing the technical skills needed for entry to employment. In the area of English language acquisition, curriculum integration has been occurring for many years through “vocational English as a second language” (VESL), a strategy that has been demonstrated to be among the most effective for fostering learning of both language and technical skills.

The new emphasis in Perkins IV on articulation of CTE programs to the baccalaureate level and increased interest in integration in the California Community Colleges suggest that closer integration of CTE and non-CTE (“general education”) academic programs requires increased attention, to ensure that students have the foundation skills to progress to four-year universities if they so choose.

Currently all AA/AS degrees require general education (Title 5) as well as a major or area of emphasis. Most courses (75%) that are degree applicable are also transferable CSU and 64% are transferable to CSU or UC. Of those transferable courses in Fall 2006, 42,315 were CTE

courses. The largest numbers of transferable courses occur in the Business and Management (7,429), Family and Consumer Sciences (5,852), and Engineering and Industrial Technology (5,776) disciplines.

All CTE programs leading to an associate degree have the same general education requirements as non-CTE programs leading to an associate degree, which are specified in Title 5, section 55806.

In addition, certificate programs of less than two years often include either UC or CSU transferable general education courses or applied academic courses that provide necessary foundational, academic, and general education skills for the occupational area. Short-term CTE programs often include contextual, foundational, and academic skills within CTE courses.

Online Support for Curriculum Integration. Numerous Web sites exist at the college level for integrating academic and CTE content. Many of these sites include resources, such as handbooks, presentations, and lesson suggestions for educators interested in combining classroom content with information on strategies for success in the workplace. For example, the Web site, 4faculty.org, an online professional development network, offers learning modules to assist community colleges with building integrated curricula. In addition to faculty resources with downloadable templates for teachers, the site allows community colleges to share news, policies, procedures, and teaching and learning materials with their faculty as well as other colleges.⁸⁸ When educators log in to the Web site, they are taken to a navigation area with a list of modules offering lectures, best practices, recommended reading, and tips on such topics as Building Your Syllabus, Effective Class Management Skills, and How People Learn.

“Work-Based Learning Connections” (WBLC),⁸⁹ an online resource for community college faculty, administrators, and local business partners, features an archive of the WBLC biweekly email newsletters. The newsletters are organized by categories relating to workplace success, such as Going Global, Experience the Workplace, The Changing World of Work, and Know How Skills. For example, one newsletter includes step-by-step lesson plans on particular career-related subjects such as branding, informational interviews, and why credit history matters to employers. Each issue of the newsletters also include teaching tips, activities, and links to other online documents that educators would find useful in connecting their college courses to careers.

Professional Development. In the community college system, the ten advisory committees and the seven regional consortia support the development of effective practices in both discipline-specific and cross-disciplinary issues.

Work-Based Learning. Work-based learning is offered at the community college level through Cooperative Work Experience Education, which links classroom curricula with experiences in the workplace. Occupational Work Experience is more closely tied to CTE coursework than General Work Experience, which is available to all students as a means to explore career options and develop general workplace skills.

Despite these efforts, work remains to ensure the highest quality programs. The CTE Model Curriculum Standards have yet to be fully implemented and educators have encountered a number of challenges to integration. The lack of time is a clear impediment; designated time is

⁸⁸ 4faculty.org. <http://4faculty.org/public/about4.htm> (accessed July 31, 2007).

⁸⁹ Work-Based Learning Connections. <http://www.wblconnections.com/qt.htm>. (accessed July 26, 2007).

needed to plan, to meet with colleagues across disciplines, and to teach and assess using project-based approaches and performance tasks. A large inventory of easily accessible model curricula is also lacking. In addition, there is a need for more professional development, for both CTE and non-CTE instructors. CTE instructors need professional development to identify and reinforce the academics inherent in their technical areas and align their instruction with academic requirements of their institutions and industries; and non-CTE instructors need professional development to learn effective practices for teaching academic content in contextual ways.

Additionally, work-based learning is faced with multiple implementation challenges: lack of time for faculty to develop and coordinate placements; lack of designated staff to develop and coordinate placements; lack of coordination between programs to ensure that work-based learning is linked to the classroom; lack of time for students to participate given a conventional school schedule; lack of paid workplace opportunities; liability and insurance issues; and the scheduling and logistics of transportation for students. Further, most existing Work Experience Education Programs operate independently of subject-specific CTE programs and currently offer general work experience, rather than vocational work experience that is connected to CTE curricula. While general work experience is important for providing basic workplace skills, more readily available vocational work experience would provide meaningful expansion of learning for students in CTE programs.

Needed Actions

The following strategies have been identified as critical to high-quality CTE programs, the academic rigor of CTE coursework, the rigor and relevance of non-CTE coursework, and the benefits of both in preparing all students for careers:

- Eliminate divisions between CTE and academic curricula, and between college bound and non-college-bound students at the secondary level, so that all students receive preparation for *both* ongoing education and work, including access to career exploration opportunities, development of essential workplace skills, and direct experience in a career area of choice.
- Ensure full implementation of the CTE Model Curriculum Standards and Framework for grades 7-12, through professional development, technical assistance, and monitoring.
- Consider the inclusion of CTE as a graduation requirement and engage stakeholders, including both CTE and non-CTE educators, industry, community members, parents, and students, in determining what aspects of CTE should be required for all students, for what purposes — career exploration, effective teaching and learning of academics, attainment of essential, transferable workplace skills, and/or technical skill development — and how this should occur.
- Systematically review policies and practices to identify barriers to integration.
- Provide designated time for collaboration between CTE and non-CTE faculty on the development of integrated curricula, lesson plans, and materials.

- Identify and disseminate model integrated curricula that have been reviewed for adherence to both academic and current industry standards, and are useful to both CTE and non-CTE instructors for increasing the rigor of CTE and the relevance of non-CTE courses.
- Expand professional development for CTE instructors and administrators, at both the district and campus levels, on the broad topic of reinforcing the academic rigor inherent in CTE courses and otherwise increasing the rigor of CTE.
- Expand professional development for non-CTE instructors and administrators, at both the district and campus levels, on the broad topic of integrating career themes and activities into their courses.
- Provide supplementary resource materials on the integration of CTE content and applied learning strategies into academic curricula and instruction to augment the core academic K-12 California Curriculum Frameworks.
- Continue to strengthen the communication between the University of California Office of the President and high schools and ROCPs on the requirements for “a-g” approval of CTE programs, with a focus on providing specific guidance and feedback to CTE faculty on their course proposals.
- Expand classroom-linked work-based learning and work experience education opportunities through strengthened industry partnerships, effective coordination with ROCP, adult schools, Work Experience Education, and Co-operative Work Experience Education programs, and a systematic review of policies and practices that create barriers to access, including insurance, liability, and other issues.
- Make externships or job shadowing opportunities in industry more readily available to both CTE and non-CTE faculty, counselors, and staff, enabling them to observe and experience the application of knowledge and skills in the workplace.
- Embed workplace and technical skills in adult basic education, GED, English as a second language (ESL), and development education (DE) curricula to enhance relevance and facilitate learning for students in these programs.
- Work with industry to expand industry-based certifications and licensure opportunities to promote programmatic rigor, students’ technical and academic achievement, and student transitions to employment and further education.
- Support research and evaluation as needed to determine how CTE and integrated curricula impact student learning, graduation rates, preparation for careers, and other outcomes.

Career Exploration and Guidance

Career exploration and guidance are central to CTE. They help ensure that students have access to information and experiences that allow them to envision a wide range of possibilities for their lives and to make informed decisions, both while in their educational programs and

throughout their careers — decisions based both on their own interests, needs, and goals, and on a thoughtful assessment of opportunities.

Definition and Significance

In the 21st century economy, it is expected that workers will likely change jobs, and possibly careers, multiple times during their lifetimes. In addition, new health care and employment policies and tax laws add complexity to employment transitions. In order to make these transitions successfully, individuals must be able to set goals, navigate the possibilities, identify appropriate opportunities, evaluate options, and make wise decisions. Above all, they must understand their own interests, skills, talents, and areas needing development, and know how to research their areas of interest and manage their own careers, accessing opportunities and support as needed, in order to continuously learn and upgrade their skills.

The process of career development is, in other words, the process of discovering **one's interests and aptitudes — or one's passion —** and then generating and seizing opportunities to bring that passion to life. This process evolves throughout childhood, youth, and adulthood in distinct ways and stages, beginning with open-ended exploration in the earliest years and progressing to goal setting and reevaluation in adulthood.

Career development and guidance within CTE encompasses both the services offered by counselors and career guidance staff and the career exploration that may occur through classroom-based, center-based, or work-based activities. Career exploration activities may range from simple reflection exercises, career-related research, assessments, informational interviewing, and speakers to workplace tours, job shadowing, mentoring, and work-based learning, where students have the opportunity to explore all aspects of an industry.

In addition, beyond self-knowledge and exposure to options, students of all ages need opportunities to develop essential transferable workplace skills. Such skills have been enumerated over the last two decades, **beginning with the development of the National Career Development Guidelines and the identification of the SCANS⁹⁰ skills, later with the articulation of “new basic skills”⁹¹, and more recently, with the compilation of the Partnership for 21st Century Skills.** The latter include⁹²:

1. **Core subjects and 21st century themes, including core academic subjects supplemented with the following:**
 - **Global awareness**
 - **Financial, economic, business, and entrepreneurial literacy**

⁹⁰ In 1990, the U.S. Department of Labor, Secretary's Commission on Achieving Necessary Skills (SCANS) compiled a list of three sets of foundation skills (basic skills, thinking skills, and personal qualities) and five sets of competency skills (resources, interpersonal, information, systems, and technology); see Appendix A for the complete list.

⁹¹ In 1996 Murnane and Levy identified the “new basic skills” as including the ability to read at the ninth-grade level or higher; the ability to do math at the ninth-grade level or higher; and four new “soft skills” required for the workplace: the ability to solve semistructured problems where hypotheses must be formed and tested; the ability to work in groups with persons of various backgrounds; the ability to communicate effectively, both orally and in writing; and the ability to use personal computers to carry out simple tasks like word processing. Murnane, R. J., & Levy, F. (1996). *Teaching the new basic skills: Principles for educating children to thrive in a changing economy*. New York, NY: The Free Press.

⁹² The Partnership for 21st Century Skills, Framework for 21st Century Learning, http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=254&Itemid=120, accessed November 5, 2007.

- Civic literacy
- Health literacy

2. Learning and innovation skills

- Creativity and innovation skills
- Critical-thinking and problem-solving skills
- Communication and collaboration skills

3. Information, media, and technology skills

- Information literacy
- Media literacy
- ICT (information and communication technology) literacy

4. Life and career skills

- Flexibility and adaptability
- Initiation and self-direction
- Social and cross-cultural skills
- Productivity and accountability
- Leadership and responsibility

A complete list of the skills enumerated by these three initiatives, along with those listed by Equipped for the Future, is provided in Appendix A.

These kinds of essential workplace skills are often best learned through direct experience, including projects, simulations, school-based enterprises, internships, and jobs. Such experiences can be offered in classrooms, through career technical student organizations (CTSOs), in the community, and in the workplace. Where available, career pathways offer these opportunities through contextual learning experiences. The interplay of exploration, reflection, and direct experience with feedback and guidance offered by staff, teachers, mentors, employers, and peers offers rich opportunities for students to learn about themselves as they learn about the world and how to make their way through it.

Current Key Activities and Initiatives

California offers career exploration and development opportunities to students in a number of ways and support for this has grown in recent years.

Counseling and Career Guidance

Many high schools and community colleges have career centers that provide career-related materials and a range of services, from career assessment to job search and preparation activities. High school career centers also issue work permits, while most community colleges have separate job placement services. In addition, many counselors in both segments offer career-related support combined with academic counseling. Recent legislation is supporting an increase in the number of counselors available at the K-12 level, along with a requirement that counselors provide information to students about CTE programs and courses required for UC/CSU admission, in addition to information about services to help students pass the California High School Exit Exam.

One of the major goals of an ROCP is to provide counseling and guidance in CTE. This service is provided in several ways. Some ROCPs hire and maintain their own counseling staff and provide services themselves. Others contract with participating districts for partial use of school-based counselors, and still others use a combination of ROCP and outside services.

California Partnership Academies and other career pathways and learning communities in high schools, adult schools, and community colleges offer career-related curriculum and experiences that allow students to explore their areas of interest in depth, with partnership academies also requiring summer internships.

The California State Budget Act of 2006 (AB 1802, Chapter 79) amended the California Education Code to ensure that students in grades 7-12 receive counseling services. Subsequently, California published *The California Results-Based School Counseling and Student Support Guidelines* to help counties, districts, and schools review and strengthen their existing school counseling and student support programs or to create such programs where none exist. The guidelines address **the three domains of school counseling**: academic, career, and personal/social. The purpose of the career domain is to help students make a successful and lasting transition between school and the world of work and from job to job across a lifespan. The following three areas of proficiency are delineated:

- Proficiency A: Students will acquire the skills needed to explore, create, and discover life and career options.
- Proficiency B: Students will use strategies to achieve future career goals that promote individual success and personal satisfaction.
- Proficiency C: Students will master skills that assist in maintaining and/or advancing careers.

The Governor's 2005-06 budget called for expanded career technical educational opportunities for middle school as well as high school students and improved linkages between the career technical curricula of the high schools, ROCPs, adult schools, and community colleges. Toward those objectives, Senate Bill 70 (Scott) established the Career Technical Education/Economic and Workforce Development Pathways initiative. One of the key objectives of SB 70 is to support projects that create, improve, or expand middle school career exploration and awareness activities, programs, curricula, and/or events that can be replicated regionally or statewide. Projects develop curricula for career awareness and exploration strategies.

In addition, students and transitioning adults in California have access to a wide network of One Stop Career Centers where the Employment Development Department, the Department of Vocational Rehabilitation, ROCPs, adult school programs, community colleges, and numerous community-based agencies are co-located to provide state-of-the-art universal access to career services, with intensive services for those meeting economic thresholds and other criteria. To serve youth, local Workforce Investment Boards contract with agencies that provide youth with career exploration and development services linked to education.

Career-Related Tools and Resources

California has also established the California Career Resource Network (CalCRN),⁹³ which provides students throughout the state with a range of online and hard copy resources and materials. The CalCRN Web site⁹⁴ offers various materials such as planning guides and assessment tools as well as links to job listing resources, job search preparation guides, and career development information specific to California, including skills and degrees required for many career areas and specific occupations, from agriculture to zoology.⁹⁵ In addition, in early 2005, CalCRN developed The Real Game™ California, which incorporates California economic and workforce information and gives students many of the essential skills to become self-sufficient, career self-managers for life. This career management curriculum is aligned with existing standards, including: the California Academic Content Standards; the California CTE Model Curriculum Standards; Equipped for the Future Content Standards for Adult Literacy and Lifelong Learning; National Career Development Guidelines; American School Counselors Association (ASCA) National Standards for Student Academic, Career, and Personal/Social Development; and the SCANS skills and competencies.

In addition, a number of online resources exist that offer materials about how to implement career development programs and courses. The California Resource Clearinghouse⁹⁶ offers a free online library where educators can search for and borrow books, periodicals, pamphlets, worksheets, and various media pertaining to career development in the classroom and career centers. Additional online resources are available at School and Beyond⁹⁷ a Web site that offers career exploration and development curricula for students of all ages, in addition to information and tools to support integrated curricula and work-based learning.

The Employment Development Department's Labor Market Information Division⁹⁸ also provides in-depth information about careers, job availability and earnings, categorized specifically for educators and job seekers. Additionally, resources are available through the community college discipline-industry collaborative Web sites where curriculum, materials, and effective pedagogies are shared, as well as information about student participation in industry-sponsored events.

Identifying the Essential Skills That All Students Should Possess

With regard to articulating and highlighting the importance of essential transferable workplace skills, California has made great progress in the last several years. In 2005, the State Board of Education adopted CTE Model Curriculum Standards, which include 11 foundation standards that all students need to master to be successful in career technical education curricula and in the workplace. These standards are similar to the competencies described in the June 1991 report issued by the U.S. Department of Labor, *Secretary's Commission on Achieving Necessary Skills (SCANS)*. The foundation standards are uniform in all sectors, although the

⁹³ CalCRN is a state agency funded with State General Funds and Carl Perkins Funds to provide all persons in California with career development information and resources to enable them to reach their career goals. CalCRN policy is set through an advisory committee comprised of the following agencies: California Department of Education; California Workforce Investment Board; Chancellor's Office of the California Community Colleges; Department of Corrections and Rehabilitation; Department of Developmental Services; Department of Rehabilitation; Department of Social Services; and Employment Development Department.

⁹⁴ California Career Resource Network (CalCRN): www.californiacareers.info.

⁹⁵ California career development information: www.careerzone.org.

⁹⁶ The California Resource Clearinghouse: www.ca-clearinghouse.net.

⁹⁷ School and Beyond!: www.schoolandbeyond.org.

⁹⁸ EDD Labor Market Information Division: www.labormarketinfo.edd.ca.gov.

subcomponents differ. As described above, they cover 11 areas considered to be essential to all students' success:

1. Academics
2. Communications
3. Career Planning and Management
4. Technology
5. Problem Solving and Critical Thinking
6. Health and Safety
7. Responsibility and Flexibility
8. Ethics and Legal Responsibilities
9. Leadership and Teamwork
10. Technical Knowledge and Skills
11. Demonstration and Application

Despite the systems that have been put in place, work remains to ensure that all students receive the career exploration and guidance services they need. To date, career exploration opportunities have not been widely available before high school and in high school too, have not been offered comprehensively. At the community college level, while career centers exist, students do not always know about the services offered. In addition, exposure to off-site career exploration may be limited by coordination and logistical challenges. Finally, many students do not enroll in CTE or integrated programs at all due to competing claims on their time; for these students, access to career exploration opportunities is particularly limited.

With regard to capacity, most teacher and counselor preparation programs do not offer significant exposure to career-related issues, whether training in integrated, career-themed curriculum development and pedagogy, or training in career development theory and practice. Parents also are rarely engaged in the career development process.

Finally, the CTE Model Curriculum Standards and Framework, while adopted by the State Board of Education, have not yet been widely implemented and, while the SCANS skills are now widely recognized, there is still no widespread consensus among educators-at-large regarding the knowledge and skills — beyond minimum literacy and math skills — that all students should have by the time they graduate from high school.

Needed Actions

Stakeholders have determined that the following strategies are critical if the state is to attain its goal of providing all students with opportunities to explore career options and develop crucial workplace and career management skills:

- Build upon the consensus achieved through the development of the CTE Model Curriculum Standards and Framework and the Governor's support for CTE to establish a common understanding of essential skills among all stakeholders, including both CTE and non-CTE educators at the K-12, adult school, community college level, as well as parents, industry, and community members. Essential skills include transferable skills that all individuals need in order to navigate through life and multiple career changes, such as learning and thinking skills, life skills, **innovation and creativity**, **entrepreneurship**, and "21st century content", in addition to other employability and career management skills.

- Develop a comprehensive career guidance system — K-adult — including such components as age and stage appropriate systematic assessment, guidance and goal-setting opportunities, coordination with instruction and instructionally based career exploration, coordination with advisory committees and industry sponsored forums, and cross-system, cross-segmental collaboration.
- Offer an array of career exposure and exploration activities at every grade level. Beginning at the middle school, these activities should be linked to existing programs, including academic programming and integrated pathways, to expose students to multiple options, motivate learning, and help students understand the preparation required for a variety of career alternatives.
- Promote strategies that engage peers, mentors, and parents in the career development process.
- Provide students with access to up-to-date employment-related information, including information on nontraditional careers, and facilitate transitions to employment, especially for students facing barriers.
- Ensure that counselor preparation programs provide counselors with knowledge and skills in the area of career guidance and exploration, and that teacher and administrator preparation programs expose future teachers and administrators to career development and workplace issues.
- Provide professional development for counselors, instructors, and administrators in the theory and practice of career development, including direct exposure to the workplace through job shadowing and externships.
- Disseminate career exploration and rigorous integrated CTE/academic curricula through online tools and professional development.
- Promote career exploration and the development of essential workplace skills (such as SCANS in after-school and out-of-school programs).
- Promote work-based learning and work experience education as a strategy for both career exploration and the development of essential workplace skills (such as SCANS skills), in addition to the development of technical skills.
- Link the career exploration and guidance system with regional economic development initiatives and the One Stop Career Centers.

Student Support and Student Leadership Development

Students in CTE programs — indeed, all students — come to schools and colleges with a range of needs that must be addressed in order for them to succeed in their studies and transition to future endeavors. Needs may range from transportation, child care, and translation services to mentoring and coaching for success in highly challenging CTE competitions and projects or transition to new career opportunities. This section addresses the range of services and

programs that support and reinforce technical and academic learning, with an emphasis on the relationships — organizational or personal — that make these programs work. It also includes outreach to students for enrollment in CTE, which, in itself, promotes learning and success. Stakeholders emphasized the importance of enrolling students into CTE programs as a means to engage them and facilitate learning, and the subsequent importance of providing the support services necessary to ensure their success.

Definition and Significance

Student support and leadership development take many forms, and include:

- Outreach programs
- Referrals and links to services both on and off campus
- Instructional support (e.g., tutoring; vocational English as a second language programs)
- Support for child care, transportation and other needs
- Recruitment of students into career technical student organizations (CTSOs)
- Coaching, career development, mentoring, and leadership development through CTOSs
- Assistance with transitions to employment
- Adult basic skills and remedial education programs
- Personalized learning environments
- Flexible and individualized technology based instruction
- Professional development to assist faculty and staff in working effectively with special populations

For students to succeed in an age of increasing classroom rigor and competition for employment, proactive student support services are of paramount importance. In particular, attention must be invested in addressing the needs of special populations, defined in Perkins IV as “individuals with disabilities; individuals from economically disadvantaged families, including foster children; single parents, including single pregnant women; displaced homemakers; individuals with limited English proficiency; and individuals preparing for nontraditional fields.” Given the large percentage of students falling into at least one of these categories, services to these special populations are vital. Unlike previous versions of the Perkins Act, Perkins IV imposes an additional requirement that data on the achievement of special populations be disaggregated by subpopulation, to enable administrators to identify areas of needed support for each group.

For each of the first five special population groups (students with disabilities, students with limited English proficiency, displaced homemakers, single parents, and economically disadvantaged students), unique needs can be identified. The sixth category, students in nontraditional occupations for their gender, does not identify a characteristic of the population, but rather a career choice of students who have enrolled in CTE courses or programs that lead to employment in occupations nontraditional for their gender. Recruiting students — particularly women — into nontraditional occupations is, in itself, a “support strategy;” **recruiting men into high demand occupations such as nursing is also important.**

Studies have shown that special population students experience multiple challenges at different phases during their enrollment and progress in CTE programs. Among the difficulties cited are few role models; competing demands of work and family obligations; inadequate child care;

logistical issues such as difficulty with transportation; academic challenges; and limited English proficiency. Systemic barriers include limited sharing of information about available support services, lack of training and professional development for CTE program staff on effective strategies for serving special population students, insufficient numbers of classroom aides, lack of materials in languages other than English, and inadequate time to cover course content.

Current Key Activities and Initiatives

Beyond implementing long-standing targeted programs such as Workability, a work experience program for students with disabilities, and CalWORKS, which provides education and training to individuals transitioning from welfare, California is carrying out numerous initiatives to support student learning, skill development, and success in the workforce. Some of these include focused attention to the needs of special populations through the work of the Joint Special Populations Statewide Advisory Committee; a particular emphasis on nontraditional occupations; an increasing emphasis on services targeted to incumbent and re-entering workers; support for CTSO; and the personalization of learning environments. Each of these is discussed below.

The Joint Special Populations Statewide Advisory Committee

The Joint Special Populations Statewide Advisory Committee (JSPAC) is a joint effort of the CDE and the CCCCO to develop the academic, technical, and essential workplace skills of secondary and postsecondary special population students. Perkins IV funds support the JSPAC in carrying out the following activities:

- Identifying and disseminating specialized curriculum materials and resources to support services to special populations, including books, videos, software, and other materials for students or to support professional development
- Expanding linkages with other programs for which equity and service to special populations is mandated or critical to program success; sharing information on best practices; coordinating and leveraging resources to maximize the number of students who can be served; and incorporating the expertise, resources, and support of those having a stake in ensuring all students succeed in school and the workforce, including business and labor and community-based organizations
- Continuing to expand the relationship between the CDE and CCCCO in serving special population students and involving other staff in all Perkins planning and implementation
- Linking with other state and federal agencies serving special populations and offering jointly developed professional development and technical assistance

Nontraditional Careers

Nontraditional careers for women offer 20-40 percent higher wages than traditional women's jobs, and a dramatic increase in earnings over a lifetime. Yet, since the loss of gender equity funding in Perkins III, services for women in special populations groups has declined across the nation. California has nevertheless provided consistent support for secondary and postsecondary nontraditional career education through its use of the maximum level of

Perkins funding allowable for this purpose. Particularly effective are professional development and training for LEAs that focus on career guidance, outreach/recruitment, and retention strategies to promote and encourage all students, especially women, to pursue high skill, high wage, or high demand nontraditional occupations.

Services and Strategies Targeted to Incumbent Workers and Those Re-Entering the Educational System

The California community colleges are increasingly committed to meeting the education and training needs of incumbent and re-entry workers. While not considered by statute to be members of a special population, these students need support services that may differ from other students, including counseling services that help them identify their transferable skills or targeted training to help them master new technologies. They may also need referrals to support services offered by other agencies; access to open-entry/open-exit programs, weekend and evening classes; and distance learning opportunities that facilitate learning outside the workday.

Career Technical Student Organizations (CTSOs)

A primary vehicle for offering support and personalization, as well as leadership development opportunities, is through the extensive and deeply rooted system of national CTSOs, already mentioned as structures that facilitate curriculum integration and career exploration. CTSOs are available to both secondary and postsecondary students, and currently exist in California in the five traditional CTE career areas listed below; a CTSO does not yet exist for students in the Arts, Media, and Entertainment area, as this is a relatively new career area.⁹⁹

- Agriculture Education: Future Farmers of America (FFA)
- Business and Marketing Education¹⁰⁰: DECA: An Association of Marketing Students,¹⁰¹ and Future Business Leaders of America (FBLA)
- Health and Human Services: Health Occupations Students of America (HOSA)
- Home Economics Careers and Technology (HECT): FHA-HERO¹⁰²
- Industrial and Technology Education: SkillsUSA

CTSOs provide students in CTE programs with carefully structured leadership development opportunities, career skills, opportunities to participate in competitive career-related events, and community service opportunities. They also offer connections with peers, alumni, and adults who can serve as mentors, counselors, and conduits to prospective employers.

Community colleges also offer numerous discipline-focused national, statewide, and local organizations to provide leadership opportunities for students. Such organizations provide

⁹⁹ See Chapter 1 for a list of the 6 major career areas and the distribution of the 15 industry sectors among them.

¹⁰⁰ Includes the Information Technology industry sector.

¹⁰¹ DECA was formerly known as Distributive Education Clubs of America, but changed its name to focus on marketing, leadership, and entrepreneurship.

¹⁰² FHA-HERO was formerly known as Future Homemakers of America-Home Economics Related Occupations, but changed its name to decrease the emphasis upon the word "homemaker" and increase the emphasis on leadership and career development.

access to business and industry leaders and opportunities for competitions within the discipline or industry area. CTSOs in the postsecondary environment often focus on specific occupational areas (e.g., Interior Lighting, Child Development, Media Arts) and often include both campus organizations and professional organizations related to the discipline. Economic Development Initiative regional centers and community college collaboratives often fund statewide competitions to support student professional development. For example, the Media and Entertainment-funded Centers have conducted media arts competitions in which students were recognized in more than 50 categories, such as digital imaging, interactive multimedia, and computer modeling. Students are also encouraged to become involved in departmental professional organizations and campus organizations, activities, and competitions. Participation contributes to students' career development and offers the opportunity to network with peers and professionals. In addition, students often are able to get scholarships and attend monthly professional meetings and seminars that are helpful to their studies.

The success and longevity of CTSOs is owed in large part to industry involvement. Given their interest in ensuring that students are well-prepared to enter the workforce, industry organizations provide financial support, sponsor competitions, and offer students work-based learning and career exploration opportunities.

In addition, in the agricultural sector, California's Agricultural Vocational Incentive Grant Program helps to support the agricultural CTSO, the Future Farmers of America, through assistance with student dues, support for student competitions, and other means.

Given the importance of CTSOs in CTE, California is dedicating \$2 million annually in SB 70 funds over the next five years for curricular activities for secondary and postsecondary CTE student organizations to strengthen and reinforce leadership skill development and participation.

Personalized Learning Environments

The general benefits of learning communities, career academies, and pathways have been discussed in the context of integrated curriculum and faculty collaboration. An additional and essential feature of these learning communities is that they offer personalized learning environments and structured instruction so students are known and supported by all the community's faculty and staff. Efforts are underway in the K-12, adult school, and community college systems to expand the number of learning communities available to students.

In sum, California provides extensive targeted services to students with a variety of needs. Schools and colleges also offer access to CTE student organizations and personalized learning environments. The challenge for CTE educators is ensuring that students have access to these programs and services, as well as to CTE programs that, in themselves, provide support and personalization. Identifying student needs is complex and time consuming, and resources to conduct outreach, offer CTE materials in languages other than English, or provide needed academic support and remediation are limited. However, all of these supports are necessary if students are to succeed, especially in programs that are increasingly rigorous.

Needed Actions

Stakeholders have identified the following strategies as critical for improving support services, personalization, and leadership development opportunities for students in CTE programs, with the aim of ensuring that all students succeed in an era of increasing CTE rigor and workplace complexity:

- Ensure that all CTE programs and curricula are designed to meet the needs of both special population students, including special education students and English learners, and the general student population.
- Provide career exposure and exploration in the early grades to engage students, emphasizing career awareness about high wage, high skill, or high demand occupations.
- Expand outreach to special populations to ensure their awareness of CTE course offerings, pathways, and learning communities, as well as high skill, high wage, or high demand careers, including nontraditional careers.
- Expand and strengthen vocational English as a second language programs **connected to specific CTE programs** and make curricular materials in languages other than English more readily available.
- **Provide professional development to faculty in differentiating instruction and working with special populations.**
- Promote CTSOs **as a student engagement strategy** and embed leadership development in all CTE courses.
- Improve linkages to and coordination of support services for students in CTE programs, especially transportation and child care services.
- Redesign existing programs to allow for more open-entry/open-exit options for students and innovative distance learning approaches.
- Create career ladders that accommodate the non-academic demands faced by all students, including those designated as members of special populations, and incumbent or re-entry workers seeking education and training.
- Expand opportunities for students to practice job-readiness skills such as networking and interviewing, and provide support to work-based learning placements to ensure successful experiences.
- Expand and strengthen professional development opportunities for program staff (administrators, instructors, counselors, and aides) to learn how to better assess and respond to the needs faced by special populations.
- Weave support services into the fabric of instructional delivery through the expansion of learning communities and pathways that offer opportunities for more personalized teaching and learning.

- Explore opportunities to serve the needs of students in continuation schools, court and community schools, and juvenile correctional facilities by linking students to open-entry/open-exit programs in local ROCPs, adult schools, and community colleges and providing career guidance and exploration opportunities, including "sheltered" internship opportunities and mentorships.

Industry Partnerships

The unique link between industry and education is an essential feature of CTE and distinguishes it from other types of instructional designs and models. Industry partners play crucial roles in ensuring that CTE curricula are current and relevant and that students and educators have opportunities to explore their interests and learn important skills in the workplace.

Definition and Significance

Business and industry, including labor and trade organizations and apprenticeship programs, work with the education community through advisory committees, forums, and other educational and training partnerships to inform CTE program design, instruction, and assessment. These partnerships ensure CTE's relevance to the workplace and facilitate the placement of students and teachers in work experience, work-based learning, job shadowing and internships; skills identification and certification; consultation on career pathways and program design; career exploration in all grades and levels; information sharing on labor market demands and economic trends; and teacher recruitment and professional development.

Current Key Activities and Initiatives

Most industry engagement in CTE occurs through participation in advisory committees or other advisory mechanisms, through the initiatives of the community college Economic Development and Workforce Development Programs, and through opportunities offered to students and educators for direct exposure to the workplace.

Advisory Committees

Currently, the primary interface between business and industry and CTE programs is through various advisory committee structures. Specifically, all ROCP and K-12 CTE programs have advisory committees, and the community colleges have an established network of statewide advisory committees in each of six broad career areas in addition to local level advisory committees for individual programs.

Advisory committee members provide input on required workplace skills, on the local labor market, and on specific technical skill standards. To a lesser degree, they also assist with recruiting fellow employers to provide opportunities such as speakers, job shadowing, and internships, assist with resource development and/or contribute resources directly, and assist with advocacy.¹⁰³ All advisory committees meet at least annually, but many meet twice a year and some meet quarterly or monthly.

¹⁰³ A Statewide Assessment of California's Career Technical Education System. (2006). WestEd.

The consistency and depth of industry participation on the advisory committees vary widely from program to program. The primary challenge to industry engagement for educators is the time required to recruit and nurture meaningful relationships. Industry also faces the challenge of time, along with challenges in communication with educational institutions when there is no single point of contact.

Economic Development Initiatives

As mentioned in Chapter One, the Economic and Workforce Development Programs at the community college level also partner extensively with industry to identify labor market needs and priorities in regional markets and promote the development of curricula and programs to address those needs. They operate a network of 115 regional delivery centers, which work with CTE programs, and address industry-specific and other statewide strategic priorities, organized into 10 Initiatives:

- Advanced Transportation and Energy
- Applied Competitive Technologies/Manufacturing
- Biotechnologies
- Environmental Safety, Health, and Homeland Security
- Health Care Careers
- International Trade Development
- Multimedia and Entertainment
- Small Business Development
- The Workplace Learning Resources
- Business and Workforce Performance Improvement¹⁰⁴

For example, the Multimedia and Entertainment Initiative is a statewide network of community college educators working in strategic partnerships with industry and community organizations to identify and meet California's workforce and economic development needs in the Multimedia and Entertainment industry. The Initiative has a director and six regional centers working with affiliated colleges throughout California. The Initiative is committed to creating environments in which students can achieve artistic excellence and develop technological expertise for careers in the communications, entertainment, and interactive learning industries. As one of its strategies, it supports student competitions to recognize outstanding community college and high school student work in 14 categories of digital and media arts.¹⁰⁵

Work-Based Learning for Students, Instructors, and Counselors

Access to work-based learning is extensive in the community colleges through Cooperative Work Experience Education programs, but more limited at the high school level. Opportunities for teachers and counselors to observe or experience the workplace directly are even more limited, but highly valued by those who have access to these opportunities. This is particularly the case for non-CTE instructors and counselors who, in many cases, have had limited work experience outside of education.

¹⁰⁴ Attention is also being given to fostering information technologies, nanotechnology, intelligent transportation systems, logistics, and the hydrogen economy.

¹⁰⁵ For more information on the Multimedia and Entertainment Initiative, see <http://www.cccmei.net/>.

There are several key challenges to expanding student access to work-based learning. The most pressing is the time required to cultivate relationships with prospective employers and the complex logistics involved in placing and monitoring students in the field. While Work Experience Education, ROCP, adult schools, and community college Cooperative Work Experience Education instructors routinely perform these tasks, these functions are not part of the job description for most secondary instructors. Additionally, students have limited time to participate in work-based learning, given school scheduling issues and other priorities. Limited time also impedes faculty and counselor involvement in workplace learning. Liability and insurance issues also create barriers to expanding work-based learning for high schools, ROCPs, and community colleges. For its part, industry lacks access to central coordination for efficient contact with educational institutions.

Needed Actions

Stakeholders have identified the following strategies to strengthen partnerships between CTE programs and business and industry for advisory purposes and work-based learning and other direct forms of engagement:

- Create, expand, and support statewide advisory committees covering all 15 industry sectors to facilitate engagement of business and industry in those sectors and enlist their advice regarding state policies and practice, curriculum, assessment of students, technology, current and future employment trends, and new and emerging occupations.
- Create a single statewide advisory committee by drawing from the sector advisory committees, including business and industry representatives identified by the K-12, adult school, and community college systems. This committee will advise the State Superintendent of Public Instruction and the Chancellor of the California Community Colleges on the status, development, and needs of CTE.
- Build regional and local level capacity for industry and labor involvement in K-12, adult school, and community college programs and economic and workforce development efforts, including collaborative regional planning; coordination of outreach, communication, and materials development; and coordinated professional development.
- Explore opportunities for identifying “single points of contact” in educational institutions or intermediary organizations to facilitate and streamline transactions with industry. These contacts can assist in sharing labor market and workplace information, development of student work-based learning and teacher externship opportunities, and placement and supervision of students in work-based learning.
- Require advisory committees for all CTE programs at the local and regional levels through an aligned system, and require that these committees provide ongoing and meaningful input to educators.
- Work with industry and business leaders to develop incentives for businesses to give input to CTE programs and provide work-based placements for educators and students.

System Alignment and Coherence

In order to support the academic and career technical achievement of students in CTE programs, it is essential that all the components of the entire CTE system be effectively linked. System coherence incorporates several elements, including course sequencing, pathways, articulation, and coordination across sectors. Perkins IV, through its requirement that all local grant recipients implement at least one “program of study” and its support of articulation, emphasizes the importance of system alignment. Programs of study as defined in the Perkins Act 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, nonduplicative progression of courses that align secondary education with postsecondary education to adequately prepare students to succeed

They may also “include the opportunity for secondary education students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary education credits.”

Definition and Significance

System alignment and coherence ensures that students can make smooth transitions along seamless pathways, from secondary to postsecondary education and training, and upgrade skills over a lifetime of learning.

At the program level, CTE requires sequential skill building to enable mastery and application in the workplace. CTE courses, therefore, require coherent course sequences within the K-12, adult school, and community college systems, across the systems as students transition from secondary to postsecondary education, and across various programs and funding streams. To the degree that learning is enhanced through integration, course sequences are best implemented through coherent pathways that align CTE and academic instruction. To build these pathways, in turn, requires coordination with industry and the workforce and economic development sectors.

System alignment and coherence encompass:

- Sequencing of courses and creation of curricular pathways
- Articulation of secondary and postsecondary curricula and alignment of community college to baccalaureate level programs
- Implementation of dual enrollment strategies
- Coordination of programs within each segment, including district, ROCP, and adult schools in the K-12 system, and, in the community college system, between credit and noncredit programs

- Coordination overall among education, workforce development, and economic development initiatives

Increased interest in alignment and coherence is reflected in growing support for the development of statewide systemic pathways, based on the following trends:

- A growing research base about student learning and engagement, which emphasizes coherent integrated programs that harness student interests
- Greater recognition of the need for demand-driven and sustained partnerships between community colleges; business, workforce and economic development efforts; and community leaders focused on meeting regional, sector-based workforce needs
- Evolving models of sustainability as state and federal policies align and encourage connections among students, careers, the labor market, and economic development, allowing multiple funding sources to be blended to cultivate continuity
- The emergent thinking about career pathways as a critical economic development tool that leverages the concept of industry clusters to develop workforce talent and skills that can meet the needs of regional and state economies¹⁰⁶

Current Key Activities and Initiatives

Currently, there are several efforts in place to foster greater alignment and to strengthen coherence within CTE programs. Some of these efforts are curricular and instructional, while others include changes in policies, procedures, or programs. Collectively, they aim to link various CTE components in ways that enable student learning and progression from secondary to postsecondary and beyond.

Course Sequences and Pathways

CTE course sequences are available throughout the K-12, adult school, and community college systems in California. Pathways are increasing in number at the secondary level, offering powerful ways to engage students in learning and facilitate promotion to postsecondary education and careers. Some pathways, such as those embedded within California Partnership Academies, begin in the 10th grade, whereas those offered by the ROCP usually begin in the 11th grade, though recent legislation now allows the ROCP to offer its courses to students as young as 15, under certain circumstances.

Within the community college system, career pathways are not simply viewed as another program or “major”, but rather as a framework for transforming educational institutions to meet the ongoing learning needs of students and industries. The ultimate goal is to provide a seamless system of career exploration, preparation, and skill upgrades linked to academic credits and credentials, with multiple entry and exit points spanning from middle school through secondary and postsecondary education, and adult and workforce training.¹⁰⁷

¹⁰⁶ National Council for Workforce Education, October 2006. *Career Pathways as a Systemic Framework*, p. 3.

¹⁰⁷ Ibid.

Efforts are currently underway to organize pathways among the K-12, adult school, and community college systems. At the secondary level, the implementation of the CTE Model Curriculum Standards will help standardize and organize the pathways. The community colleges are using SB 70, informed by Economic Development initiatives, as a vehicle to promote pathways formation aligned with regional economic development priorities. They are also “crosswalking” existing majors with the 15 industry sectors and pathways identified in the CTE Model Curriculum Standards for grades 7- 12 to facilitate secondary to postsecondary alignment.

Despite these alignment efforts, access to pathways, especially those that integrate CTE and academic instruction, is still limited for students. Declining CTE enrollments at the secondary level and funding caps at the postsecondary level limit the availability of course options in schools or colleges, even when priority alignment to regional economies and statewide strategic priorities are taken into consideration. When course sequences exist, low enrollments and funding caps can challenge their viability. While low enrollments overall limit student preparation for more advanced levels of instruction or for entry into the workplace, some educators are concerned that low enrollments in grades 9 and 10 also hamper educators’ efforts to engage students in meaningful, relevant curricula at a time when the students may be most vulnerable to disengagement. The challenges of master scheduling, inadequate facilities or equipment for classes, and limited time to engage employers all further hamper the creation or expansion of pathways.

SB 70 grant funding, which has increased to \$52 million for fiscal year 2007-08, is supporting efforts to address these challenges and to build pathways throughout the state that link secondary and postsecondary curriculum and instruction. In the first two years of funding, more than 75 grants were made to local partnerships to strengthen CTE pathways in sectors such as Transportation; Health Science and Medical Technology; Arts, Media, and Entertainment; and Manufacturing and Product Development.

Cal-PASS Professional Learning Councils

California Partnership for Achieving Student Success (Cal-PASS) Professional Learning Councils provide additional support for alignment efforts in CTE. Cal-PASS councils are regional teams of discipline-based faculty from elementary, middle school, high school, adult school, community college, and university segments. They collaborate to discuss curriculum, exemplary teaching practices, instructional materials, and performance measures that are shared and reviewed in light of transition data. When faculty members work together with their intersegmental colleagues to understand the barriers to successful student transition, solutions to these barriers are proposed and implemented, leading to a more seamless curriculum and improved instructional strategies.

Articulation

According to the 2001 *California Articulation Policies and Procedures Handbook*, course articulation is the process of developing a formal, written, and published agreement that identifies courses (or sequences of courses) from a “sending” campus that are comparable to, or acceptable in lieu of, specific course requirements at a “receiving” campus. Articulation ensures students and faculty that students have taken the appropriate courses, received the necessary instruction and preparation, and that outcomes for students are similar to those that would have been attained had the course been taken at the community college. This enables a

smooth progression to the next level of instruction at the receiving institution.¹⁰⁸ Successful articulation promotes student retention, persistence, and program completion, and efficient use of facilities and resources.

In July 2005, the Academic Senate for California Community Colleges was funded to develop Statewide Career Pathways, a project aimed at creating school to college articulation in CTE. Reinforcing the community college system's commitment to the importance of effective alignment, this project specifically intends to increase the number, efficiency, and transportability of articulation agreements among high schools, ROCPs, adult schools, and community colleges.

In the 2007-2008 academic year there are 101,930 CCC courses that are CSU transferable, and of those, 46,363 are also UC transferable for baccalaureate credit in the project ASSIST database. In the 2007-2008 academic year there were 1,883 published articulation agreements between CCC and CSU and 893 between CCC and UC that allow courses to meet four-year degree requirements. These agreements provide for 28,545 CCC courses that meet CSU GE-Breadth Certification Requirements and 47,447 CCC courses that are directly articulated (for a major requirement) with 9,840 CSU courses. Of the 46,363 courses transferable for baccalaureate credit at a UC, 19,890 CCC courses are qualified to meet IGETC requirements and 28,673 CCC courses are directly articulated (for a major requirement) with 2,847 UC courses.

The current differences in course and program offerings in the secondary and postsecondary systems pose challenges to articulation, as does the time required to negotiate agreements. However, under SB 70, a number of competitive grants have been awarded to K-12, adult school, and community college partnerships to improve coordination of CTE, including improved CTE course and program articulation. In addition, a small number of these partnerships include four-year institutions as partners. Finally, there is increasing interest in articulation directly from secondary programs to four-year institutions, whereby both curricula and teacher qualifications are analyzed to ensure adequate rigor and preparation of students for postsecondary-level work.

Tech Prep

Tech Prep programs are designed to link high school and two-year college programs in specific technical fields and occupational areas. They are "planned sequences of study in technical fields or pathways beginning as early as grade nine and linked to two or more years of postsecondary education or through an apprenticeship program of at least two years following secondary instruction. The sequence culminates in an associate degree or a certificate."¹⁰⁹ Combining at least two years of high school CTE and academics with two years of postsecondary education, Tech Prep programs are designed to provide maximum preparation for higher-wage employment or continued education.¹¹⁰

Funding is awarded through consortia led by a community college district office or county office of education and include the local community colleges working in collaboration with K-12 districts, schools, adult schools, ROCPs, and local business partners. In 2006-07, there were 80

¹⁰⁸ *California Articulation Policies and Procedures Handbook*, Revised Spring 2006, p. 6.

¹⁰⁹ U.S. Department of Education, <http://www.ed.gov/programs/techprep/index.html> (accessed August 1, 2007).

¹¹⁰ *California Career Technical Education Curriculum Framework*. Sacramento, CA.: California Department of Education, 2006a.

Tech Prep consortia, operating across California, involving all 109 community colleges.¹¹¹ In addition to enrolling students in course sequences, Tech Prep consortia also offer technical assistance, professional development, curriculum support, and other resources to schools and colleges in their areas. They cover core strategies of secondary-postsecondary articulation, curriculum integration, work-based learning, inclusion of special populations, and outcomes-based assessments.¹¹²

Dual or Concurrent Enrollment and Dual Credit

Dual or concurrent enrollment allows high school students to gain community college credits while still in high school. Data from two National Center for Education Statistics' surveys found that, during the 2002-03 academic year, 71 percent of public schools offered courses for dual credit and 57 percent of postsecondary institutions had high school students taking college credit courses.¹¹³ This strategy is seen as a powerful motivator for students, particularly when students are able to take classes on community college campuses as they do in "middle college high school" programs. Dual enrollment programs provide otherwise unavailable opportunities to students, keep students in school, expand course selections, and decrease time to earn degrees. A Community College Research Center study in the state of Florida found positive relationships between dual enrollment participation and short- and long-term outcomes for both the sample and the CTE subsample. Dual enrollment participants were more like to earn a high school diploma, enroll in college and enroll full time, persist to a second semester, have higher postsecondary GPAs, and have earned more postsecondary credits three years after high school graduation. Low-income and male students saw larger benefits to their participation than did other subgroups.¹¹⁴

Currently, in California, school districts can claim full average daily attendance for dually enrolled students, as long as they are enrolled in and attend high school for at least 240 minutes per day. Senate Bill 338 (2003) stipulates that school districts may determine which students might benefit from "advanced scholastic or vocational work"; students must obtain the principal's recommendation and parental consent; community colleges may restrict admission based on age, grade level, or multiple assessments; and in order for colleges to claim FTE, classes must be open and advertised to the general public. High school students entering community colleges are considered "special admit" students; there are approximately 29,000 special admit students in credit-bearing CTE courses, representing about one-fourth of all special admit students in credit-bearing community college courses.

Despite its promise, nationally, schools with higher minority enrollments are currently less likely to offer dual enrollment than schools with lower minority enrollment;¹¹⁵ thus, greater access for minority students is necessary. However, there are several hurdles to bringing dual enrollment

¹¹¹ *Tech prep Allocation Report*. Sacramento, CA.: California Community Colleges Chancellor's Office, 2006b.

¹¹² Bragg, D. "Emerging Tech Prep Models: Promising Approaches to Educational Reform," *centerfocus*. (June 1994), 5. <http://vocserve.berkeley.edu/CenterFocus/CF5.html>.

¹¹³ Waits, T., Setzer, J. C., & Lewis, L. (2005). *Dual credit and exam-based courses in U.S. public high schools, 2002-03*. Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved October 5, 2007, from <http://nces.ed.gov/pubs2005/2005009.pdf>.

Kleiner, B., & Lewis, L. (2005). *Dual enrollment of high school students at postsecondary institutions, 2002-03*. Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved October 5, 2007, from <http://nces.ed.gov/pubs2005/2005008.pdf>.

¹¹⁴ Karp, M., Calcagno, J. C., Hughes, K. L., Jeong, D. W., Bailey, T. R. (2007). *The postsecondary achievement of participants in dual enrollment: An analysis of Student Outcomes in two states*. New York: Community College Research Center Report Draft.

¹¹⁵ U.S. Department of Education, National Center for Educational Statistics (2005).

to scale. Negotiating both the high school and college schedules, the fear that schools will “double dip” (double fund), and concerns about the transferability to UC and CSU of college courses taken in high school are all challenges. In addition, some cite the challenge of providing educational services to high school students not prepared for postsecondary work; many community colleges do not have the teacher capacity, supplies, facilities or support systems in place to bring these students up to speed. Further, books and supplies can be costly for students. Some stakeholders believe that extensive use of dual enrollment will further decrease secondary CTE enrollments as students seek more of their CTE training through the community college system.

An additional innovative strategy for providing students the opportunity to earn college credits while in high school is that of providing dual enrollment community college programs on the high school campus; this strategy is sometimes called “dual credit”, to distinguish it from “dual enrollment” in general. With dual *enrollment*, instruction happens on the college campus and can interfere with the required hours of instruction on a high school campus, but with dual *credit*, instruction is provided on the high school campus by high school teachers. The curriculum is developed collaboratively with community college faculty high school teachers and assessments are developed by the community college faculty. The curriculum is fully aligned with, and has the same learning objectives and assessments as, the community college course. Students who complete the college application and pass the course with a grade of an A or B are provided college credits, noted as “credit by exam”, immediately upon completing the course.

While this strategy, which has arisen from the need for more portable Tech-Prep articulation, eliminates some of the previously mentioned barriers of dual enrollment such as college capacities and student costs, there are additional barriers to its development and maintenance. The benefits to community colleges lie in contributing to better-prepared students. However, while students earn portable college credits, those students may never attend the awarding community college. This creates a disincentive for colleges to employ this strategy, as they are expending resources to enter and maintain records for students who may never generate revenue for the college (FTEs). Finally, Tech-Prep funds for high school teachers and college faculty to align curriculum, coordinate assessments, and process student paper work are limited.

Efforts are underway to develop or strengthen dual-enrollment enhanced CTE programs. In one such effort, supported by the James Irvine Foundation, researchers are exploring how dual enrollment strategies can increase the number of low-income youth who complete high school on time and attain a postsecondary credential by age 25. A small number of partnerships, consisting of community colleges and at least one secondary partner offering integrated academic/CTE pathways, would be identified to expand CTE dual enrollment participation to low-income students. This initiative will develop and showcase CTE dual enrollment models that meet several criteria. They must:

- Ensure the rigor and integrity of college courses
- Simplify credit earning and credit transfer processes
- Create strong collaborative relationships between secondary and postsecondary partners
- Provide supports to help students succeed
- Create program sequences that span high school and college classes

Partnerships will also collect data on students’ secondary and postsecondary outcomes. The

initiative will produce information that can help inform discussion throughout California concerning the design of dual enrollment policy that meets the state's fiscal standards and needs and takes maximum advantage of the potential benefits of dual enrollment for low-income and other underserved students.

Middle College and Early College High Schools

A particular form of dual enrollment is the “middle college high school.” In 1998, the California Community Colleges created the Middle College High Schools (MCHS) initiative, enabling high-potential students at risk of academic failure to complete high school while concurrently receiving direct access to college courses and services. Located on community college campuses and integrated into the community college environment, MCHSs merge the high school and community college curricula and experience in order to enhance academic and personal success. High school students attend classes at a community college and earn credit toward a high school diploma while having the opportunity to concurrently take college courses and receive more intensive counseling and administrative attention. Currently, there are 13 MCHSs operating in California serving nearly 2,000 students.

Early college high school blends high school and college in a rigorous yet supportive program — enabling students to complete a high school diploma and the first two years of college. This innovative model is based on the understanding that a postsecondary education can be key to an individual's economic and personal success — and that the students who are least likely to achieve a postsecondary degree are most in need of early and engaging experiences with college. Since 2002, six intermediary partners in the national Early College High School Initiative supported by the Bill and Melinda Gates Foundation have started or redesigned 24 schools in California, with 6 more in the planning stages.¹¹⁶ The schools have a projected total enrollment of more than 10,000 students. The Foundation for California Community Colleges in its role as a state intermediary partner is responsible for establishing 15 of the California Early College High Schools and is working with other partners to blend the early college program design into existing small high schools previously supported by the Bill and Melinda Gates Foundation.

Coordination of Service Delivery Across Programs in Each Segment and with Other Workforce Development Efforts

Coordination across the various CTE funding streams is widespread, and conducted by a variety of programs and agencies, with ROCPs providing crucial support for career centers in many California high schools, as well as CTE curricula that are complementary to district programs. ROCPs also provide work-based learning opportunities with ROCP faculty monitoring and supervising students. However, in some counties, travel distances to ROCPs may limit student participation. Distance may also limit meaningful integration or coordination of curricula with district programs. In addition, the decline in 9th and 10th grade CTE enrollments has resulted in diminished feeder programs to ROCPs serving 11th and 12th grades.

In addition, county offices of education play a crucial role in promoting, coordinating, and implementing CTE and other career-related programs in their counties. Many of them oversee the administration of ROCP programs. Many also played lead roles in convening and managing school-to-career partnerships during the 1990s and still provide crucial leadership for countywide career-related activities through the school-to-career partnerships that continue to

¹¹⁶ Foundation for California Community Colleges, Early College High School. <http://www.foundationccc.org/WhatWeDo/EarlyCollegeHighSchool/tabid/70/Default.aspx> (accessed July 27, 2007).

operate, participation on their local Workforce Investment Boards, direct engagement with employers and employer organizations in their counties, and through the myriad convenings, programs, and organizational relationships that county offices are responsible for managing. In addition, as brokers and providers of professional development services to their local school districts, county offices of education disseminate information to the field regarding integrated curricula and smaller learning communities, among many other issues. Finally, as administrators of special education, “Workability” programs, court and community schools, and other alternative education programs, including programs for homeless children and those in foster care, play a crucial role in reaching students who are in greatest need and who could benefit from CTE.

Adult schools also partner with secondary and postsecondary institutions to provide students with seamless transitions as they participate in the CTE system. Given their mission to provide high-quality lifelong learning opportunities and services to adults in an era of rapid change, adult schools recognize the need for interagency coordination and support to continually strengthen their services.

In the community colleges, the Noncredit Alignment Project and the Community Colleges System Office Strategic Plan have focused on integrating noncredit instruction with academic and career technical credit instruction. This initiative includes strengthening the coherency and articulation of noncredit instruction with community colleges’ other instructional delivery systems and developing career pathways aligned with adult school programs. In addition, recent legislation (SB 361) was enacted to ensure equity funding for noncredit career development and college preparation courses. This has led to increased efforts to improve the coherency and articulation of adult education/noncredit instruction to postsecondary education. SB 361 will also expand the CCC’s longitudinal student record system to track the progress of adult education/noncredit students to credit postsecondary education and employment.

In addition, important models exist throughout the state for coordination between CTE and local Workforce Investment Boards, Youth Councils, and One Stop Career Centers. Such coordination was further strengthened by the passage in 2006 of Senate Bill 293, which called for the California Workforce Investment Board, in collaboration with state and local partners, including the CCCCO, the CDE, other appropriate state agencies, and local workforce investment boards, “. . .to develop a strategic workforce plan to serve as a framework for the development of public policy, fiscal investment, and operation of all state labor exchange, workforce education, and training programs.” This new plan is intended to expand the regional and local coordination of the education and workforce systems in California.

Single Plan for Student Achievement

Finally, at the K-12 level, schools are required to align all of their efforts toward the goal of student academic achievement. As described under Evaluation, Accountability, and Continuous Improvement below, schools that participate in state and federal categorical programs, funded through the Consolidated Application process, must create a *Single Plan for Student Achievement* (SPSA) to “improve the academic performance of all students to the level of the performance goals, as established by the Academic Performance Index.”¹¹⁷ School site councils must develop and approve the plans, and the contents of the plans must be aligned with school goals for improving student achievement. Although Carl D. Perkins funding is not allocated as part of the Consolidated Application process, NCLB Title I funds are. One of the requirements of

¹¹⁷ California Education Code (EC) Section 64001(a).

Title I is the coordination with other federal programs, including Perkins, and Perkins legislation, in turn, requires coordination with NCLB. These requirements for reciprocal coordination suggest that activities funded with Carl D. Perkins funds should be included in the SPSA.

Needed Actions

To promote greater alignment and coherence among components of the CTE system, allowing for seamless transitions for students while meeting the crucial workforce development needs of regional economies, stakeholders have identified the following critical strategies:

- Specify the respective roles of school districts, ROCPs, adult schools, community colleges, apprenticeships, and four-year colleges in the CTE system.
- Align funding mechanisms and accountability systems to promote the achievement of shared goals and optimal divisions of responsibility.
- Encourage and promote the development of coherent career pathways that foster complementary and integrated CTE and academic content, faculty collaboration, and secondary to postsecondary transitions.
- Provide sufficient time for faculty to build cross-segmental and cross-disciplinary collaborations aimed at aligning curricula and programs, as well as models, tools, and professional development to facilitate pathway development.
- Define a sequence of CTE foundation courses that begin in middle school, continue through grade 10, and are aligned to secondary and postsecondary career pathways.
- Increase CTE enrollments at all grade levels to engage students in learning, enable the creation of complete course sequences, and ensure sustained support and program quality.
- Facilitate program-to-program articulation and use model articulation agreements to promote consistency and minimize duplication of effort.
- Expand the number of community college CTE programs that articulate to four-year university programs.
- Examine concurrent enrollment and “credit by exam” efforts to identify promising opportunities for expansion as well as CTE growth.
- Encourage education and workforce development offices and organizations to collaborate in designing pathways that are aligned to economic development initiatives and include coordination with support services.
- Create incentives for community colleges, K-12, UC/CSU, and county/city economic development agencies/departments to work together in their cities/counties to strengthen workforce development.

Incorporate CTE programs among those aligned through consolidated planning processes at school sites.

Effective Organizational Design

For CTE to prepare students to meet rigorous standards and become lifelong learners with employable skills, the K-12, adult school, and community college systems need to be designed in ways that enable student persistence and success. Minimally, this entails the development of organizational structures that enable faculty to collaborate, link business and industry with workplace learning, promote student enrollments, and encourage course and program completion, in the process, blurring the line between education and the workplace.

Definition and Significance

Organizational design issues comprise how K-12 schools, adult schools, and community colleges and programs are structured to facilitate effective teaching and learning, and how programs and courses are scheduled and delivered to facilitate student enrollment and successful program completion. The issues to be addressed include:

- The creation and support of learning communities
- Block or alternative scheduling in high schools
- Effective use of after school, extended-day, and out-of-school time
- Choice and student mobility within and across districts
- Open-entry/open-exit opportunities
- Effective use of technology for distance learning and other career-related opportunities

Development of integrated curricula, team teaching, effective student support, meaningful career guidance, and access to work-based learning are all facilitated by the creation of career-themed learning communities — whether embedded within larger structures as “schools-within-schools” or as stand-alone programs. In addition, the use of “block scheduling,” seven-and-eight-period days, and the effective use of after school hours can enable students to enroll in CTE while completing other course requirements and facilitate participation in work-based learning. Similarly, enhanced opportunities for student mobility within and across districts, particularly when districts are small, can facilitate access to career-themed programs that may not be available in every district, due to demand and funding limitations.

For adults, programs that require uninterrupted enrollment are often at odds with the demands and realities of their daily lives. Single parents and economically disadvantaged students face particular challenges to enrolling and persisting in community college courses while meeting their economic and family obligations. CTE programs that offer open-entry/open-exit and career ladder formats give students a chance to tailor their school schedules around their personal lives, creating the flexibility to stay enrolled to complete their programs without penalties or being forced to terminate.

The effective use of distance learning and other technologies also facilitates flexibility in course delivery in response to student needs.

Regardless of whether programs are structured in an open-entry/open-exit format or sequentially, or offered in person or online, flexibility for students requires a shift from the conventional “seat time” paradigm to one based on skill mastery and the use of performance-based instructional design approaches.

Current Key Activities and Initiatives

California has implemented a variety of innovations in the structure, scheduling, and delivery of CTE.

Learning Communities

California has recognized the importance of creating environments and scheduling systems that promote integrated learning and access to programs for students. Learning communities, including state-funded California Partnership Academies and Specialized Secondary Programs, federally funded Smaller Learning Communities, and learning communities implemented in community colleges, create conditions conducive to cross-disciplinary collaboration for curriculum integration. The Partnership Academy is a three-year program that spans tenth through twelfth grades, and is structured as a school-within-a-school. The state's 290 career-themed Partnership Academies integrate academic courses and CTE, create small and personalized learning communities, and partner with businesses and community organizations. Specialized Secondary Programs (SSPs) are another vehicle for integrated learning. These programs provide students with advanced learning opportunities in academic disciplines, and often include a career focus to develop students' talents, skills, and interests as they prepare for work and higher education. Out of the 59 SSPs currently funded in California, 21 have a career focus.

As in the K-12 system, learning communities are increasingly being implemented in community colleges. A growing body of research is emerging on learning communities at the college level with early research suggesting higher course-pass rates and higher rates of completion of developmental English requirements.¹¹⁸ SB 70 explicitly includes the building of learning communities as a key strategy to promote the creation of a coherent CTE system for California. Currently, although learning communities have long been established in California community colleges, there is no systemwide data on the scope of implementation within the community college system.

Alternative and Block Scheduling

Likewise, following the postsecondary scheduling model, many high schools and middle schools have implemented block or alternative scheduling to facilitate integration of curricula, project-based learning, and innovative teaching strategies. However, for some schools, the costs of making this transition have been prohibitive, and further professional development is needed to ensure that blocked time is used effectively.

After-School, Extended-Day, and Out-of-School Programs

After-school programs hold promise for extending the school day in ways that allow students to participate in valuable integrated experiences, such as project-based and service learning opportunities, career exploration, and work-based learning. The CDE currently funds 720 after school programs through its 21st Century Community Learning Centers, including 540 elementary and middle schools and 180 high schools through its 21st Century High School After

¹¹⁸ Price, D. V., Lee, M., *Learning Communities and Student Success in Postsecondary Education: A Background Paper* MRRC and DVP-Praxis LTD, December 2005, p. 2.

School Safety and Enrichment for Teens (ASSETS) Program. Funding for ASSETS for the 2007-08 school year has been budgeted at more than \$42 million, with each high school receiving up to \$250,000 through a competitive grant process targeting high-poverty schools. CDE also supports approximately 3,800 elementary and middle schools in its After School Educational and Safety (ASES) programs. Some of these programs offer career-related programming, but further investigation is needed to ascertain the degree to which this is occurring and if these programs are connected to in-school learning or career pathways. In addition, CDE conducts professional development and technical assistance to strengthen after-school programming, including effective youth development strategies. This may offer an opportunity to expand career exploration and work-based learning for students in these programs.

Many CTE programs offered through adult schools, ROCPs, and community colleges are offered during extended-day periods including evening hours, on weekends, and during the summer months.

Secondary and postsecondary programs also exist to explicitly facilitate work-based learning as an extension of classroom learning. For example, ROCP, adult school, and high school work experience programs are structured to enable the placement and supervision of students in the workplace. Similarly, community colleges offer Cooperative Work Experience Education (Co-op) — a form of work-based learning that occurs at times and locations agreed upon by the employer, student, and supervising faculty member. These types of programs can provide flexible vehicles for expanding student access to valuable learning opportunities that enhance and extend classroom-based curricula.

CTSOs offer important project-based learning and career exploration opportunities and receive the direct support of businesses in related industries. **CTSOs are linked closely to CTE content in their occupational areas**, and offer maximum flexibility for delivery of career-related experiences.

Student Mobility Within and Across Districts

Currently, community college students have flexibility with regard to enrollment in courses within and across districts to ensure that they can access the courses they need. Secondary students are more limited in their mobility, but **often** have choices with regard to attending magnet schools, career-themed schools, or schools with specialized programs. Given limited resources for creating or expanding pathways in new career areas, and employers' need to connect to districts and schools strategically, the state, through SB 70 funding, is encouraging labor market analyses and coordination among schools to minimize duplication of pathways in a given geographic area. To ensure that this approach does not limit student access to pathways in their areas of interest, greater student mobility among high schools and across districts may be required, particularly when districts are very small. This will, in turn, require possible expansion of inter-district transfers and strategies to mitigate equity issues that may arise due to transportation or other issues.

Open-Entry/Open-Exit Programming

Many ROCP, adult school, and community college programs offer open-entry/open-exit enrollment opportunities that allow adults with multiple priorities to access "just-in-time" training to further their careers. For example, the CDE adult school program operates almost **entirely** on an open-entry/open-exit system and is implementing "managed enrollment" systems, designed

to facilitate data collection and class placements, in ways that support the open-entry/open-exit model. Many ROCP programs are also designed for open-entry/open-exit of participants. Open-entry/open-exit courses in community colleges are offered only in courses that require daily attendance accounting (known as positive attendance). Approximately 50% of colleges (58 of 116 reporting entities — colleges and centers reporting separately) offered at least one course section in open-entry/open-exit mode during 2005-2006. Statewide, about 3.6% of all course sections and 18% of positive attendance course sections were offered in an open-entry/open-exit format within the community colleges.

At the same time, a number of factors must be considered in designing open-entry/open-exit systems. The need for access to open-entry/open-exit systems must be balanced against the need for progressive skill mastery that is often required in CTE. Due to the increase in industry-based certification programs, more courses are only offered for the required hours, making it more difficult for students to enter and exit with just the few skills they need. Finally, under current funding and accountability structures, all CTE programs must be a certain number of hours to qualify for funding and students must attend the full number of hours to be considered “completers.”

Technology-Assisted Learning

Technology can offer alternatives to changing or expanding scheduling structures to accommodate student needs. Virtual Enterprise is an example of an online CTE curriculum that can be accessed irrespective of scheduling restrictions. The CCCC supports distance learning and other technological solutions to promote access to CTE programs and career exploration in a number of ways. It supports various state-funded initiatives that provide needed training in the use of educational technology for instruction, hosts courses on centralized servers, negotiates discounts on group purchases on course management systems, and ensures compliance with the laws governing accessibility. At the local level, districts and individual colleges provide courses online. In State Fiscal Year 2005/06, more than 17,000 online courses were available through these agencies.

The CDE adult school program supports distance learning and innovation projects by allowing LEAs to use 5% of their apportionment for these programs. The LEAs may use this for any adult school program they choose, but CTE has traditionally been taught through hands-on or direct instruction, and only a small percentage of adult schools use their distance learning apportionment for CTE. Given current funding structures, it is difficult for the agencies to make this program cost effective. Presently, CDE has about 25 adult schools with registered distance-learning programs in CTE. It is exploring policy changes that will allow programs to raise the percentage cap to 15%. This will enhance the prospect of the adult LEAs offering many more CTE courses through all delivery methods in the future.

The advent of online “social networking” sites such as MySpace and Facebook also offer unprecedented opportunities for online mentoring and career-related information exchange that have yet to be tapped in any formal or organized way.

Despite the availability of these programs, strategies, and technologies, work remains for California to realize its vision of providing access to high-quality CTE for both school-aged students and adults with multiple claims on their time. Demand for open-entry/open-exit programs is great, yet the need for flexibility must be matched with the need for students to build skill mastery through successive learning experiences. Schools are still generally organized and scheduled according to the needs of an agrarian society, and existing systems and norms are

becoming less relevant to the learning needs of students. Mechanisms for placing students in work-based learning — whether through after-school programs, ROCs, work experience, adult schools, or community college Co-op programs — could be used more widely. CTSOs exist in the traditional CTE areas but not in many new career areas, and the promise of technology as a means to reach students with “just-in-time” education, training, and career exploration has yet to be fully realized.

Needed Actions

For CTE reforms to take hold, stakeholders asserted the importance of organizational structures and designs that facilitate improvements, and recommended the following:

- Promote and expand career-themed learning communities, career academies, and other models structured to promote cross-disciplinary collaboration and curriculum integration.
- Provide resources and assistance to schools in reorganizing school schedules into “blocks” or seven or eight-period days to enable students to enroll in CTE beginning in the 9th grade and to facilitate enrollment in integrated programs.
- Explore opportunities for better use of after-school, extended-day, and out-of-school time for career exploration, projects, and work-based learning connected to in-class curricula.
- Promote student participation in CTSOs and develop ways to increase industry and private and public support for the creation of similar organizations in new career areas.
- Evaluate strategies to expand student access to career-themed programs that may be geographically dispersed.
- Explore the expansion of open-entry/open-exit strategies where feasible, in ways that maintain the integrity of CTE courses and course sequences and comply with industry requirements; structure and sequence curriculum in modules or “chunks” tied to jobs with multiple entry and exit points, with multiple levels of industry-recognized credentials built into the sequencing of the pathway.
- Provide education and training for students and incumbent workers at times and locations convenient to students and employers, including asynchronous or synchronous learning offered evenings or weekends, blended or “hybrid” delivery models, and delivery at off-campus locations such as job sites and community facilities.
- Promote greater use of technology assisted and distance learning in all programs, including elementary, middle and high schools, adult schools, ROCs, and community colleges.

System Responsiveness to Changing Economic Demands

For California’s immense and diverse economy to retain its prosperity and competitive position in the global market, education must meet the demand for skilled workers in a wide range of industries. A demand-driven system is responsive to current workforce development needs and labor market realities and predictions.

Definition and Significance

A demand-driven educational system:

- Builds a curriculum that is relevant to both current and future workforce needs
- Establishes public/private partnerships between industry and education to inform educational programs
- Builds the capacity of educators and counselors so that they maintain currency with the needs of the workplace
- Ensures sufficient enrollments to meet workforce needs
- Maintains sufficient funding to cover the cost of necessary equipment and facilities
- Ensures consistent and reliable data about regional economic and labor markets for the high schools and community colleges to plan programs
- “Moves at the speed of business” to address workforce needs as quickly as possible

Current Key Activities and Initiatives

CTE responds to the changing demands of industry through a variety of mechanisms.

CTE Model Curriculum Standards and Framework for Grades 7-12

In 2005 and 2006 respectively, the State Board of Education approved CTE Model Curriculum Standards and Framework for California that identify 15 industry clusters around which to organize CTE instruction, strategies for creating industry linkages including advisory committees for input on curriculum, and a recommended mechanism for the development of pathways aligned with postsecondary education and local labor market demands.

The Community Colleges' Economic and Workforce Development Program

CTE at the community college level is aligned with economic development activities and data, including ten initiatives to expand programs in emerging and high-growth industries. Objectives of the community college system's Economic and Workforce Development Program (EWDP) include the following:

- Advance California's economic growth and global competitiveness through quality education and services focusing on continuous workforce improvement, technology deployment, and business development.

- Coordinate a community college response to meet statewide workforce needs that attracts, retains, and expands businesses.
- Develop innovative solutions in identified strategic priority areas for workforce development.
- Identify, acquire, and leverage resources to support local, regional, and statewide economic development.
- Create logistical, technical, and marketing infrastructure support for economic development activities within the community college system.
- Optimize employer and student access to community colleges' economic development services.
- Develop strategic public and private sector partnerships.

The EWDP leads the state in economic development efforts, serving small businesses, strategic sectors and regions, and conducting studies on new emerging areas such as nanotechnology, digital manufacturing, new subsectors within biotechnology, intelligent transportation systems, the service sector, and international trade. The EWDP provides funding for colleges to develop and implement training and curriculum in key strategic industry sectors that will create jobs and career pathways for students. The EWDP Regional Centers act as incubators that identify changing needs and trends and link colleges with businesses. The Regional Centers also have business development services, which are augmented with fee-based services to businesses and nonprofits.

EWDP also pioneers new courses in concert with local businesses to ensure training is relevant and to create and retain jobs. It was designed to leverage local college educational resources across regions of the state and to share best practices and outstanding curricula. As part of the educational system, it assists colleges in the development of new curricula, staff development, faculty internships, and workforce training. EWD projects can expedite the local development of courses and enable colleges to respond quickly to workforce training needs, particularly in emerging technologies. Many of the courses developed through EWD become for-credit courses that help colleges answer the immediate and lifelong workforce training needs of students and incumbent workers. A specific component of the EWDP, the Industry-Driven Regional Collaboratives, addresses local short-term needs.

EWDP also serves the needs of incumbent workers. In 2006-07, the EWDP received \$8 million in ongoing funding for the Responsive Training Fund for Incumbent Workers. Grants funded under this project enable colleges to provide short-term, intensive training for incumbent workers in high growth/high wage technical positions in sectors important to California's economy (such as biotechnologies, information technologies, nanotechnologies, digital manufacturing, and Micro-Electro-Mechanical Systems). The grants may also be used to guide the state in new directions that will lead colleges to offer training in these new areas.

Contract Education

Contract Education in community colleges is a primary delivery system for providing services

to business, industry, and government agencies. California Education Code (Sections 78020-78023) defines contract education as “those situations in which a community college district contracts with a public or private entity for the purposes of providing instruction or services or both by the community college.” The direct and administrative costs of providing these services, which include credit, noncredit, and not-for-credit training, are typically recovered through fees paid by the employer or organization to the college.

Contract education programs also offer additional services designed to improve business or individual performance, including training needs assessment, training material development, performance needs analysis, job profiling, and other consulting services. They also coordinate the delivery of traditional credit enrollment classes to meet the needs of their client organizations and industries.

SB 70 Projects

The Governor’s Career Technical Education Initiative of 2005-06 (SB 70), modeled on EWDP priorities, is an initiative to begin revitalizing CTE in high schools and create career pathways for middle and high school students. The Initiative has already expanded linkages from business and industry to the high schools, ROCs, and the community colleges through its Quick Start Projects. Projects continue to be defined that will make K-12, adult school, and community college CTE programs more responsive to industry needs in high skill, high wage, and high growth areas.

Advisory Committees

In the K-12, adult school, and community college systems, industry advisory committees help ensure that curricula address workplace demands. Educators then use the input to update curricula with the skills required for the workplace and align educational process as appropriate to respond to industry needs. Individual educators’ ability to do this varies widely, depending on the level of change and innovation allowed and encouraged on their campuses.

Facilities and Equipment

Access to state-of-the art facilities and equipment is key to ensuring that students are prepared for the workplace and that programs can remain responsive to industry needs. Since launching his CTE initiative in 2005, the Governor has increased funding by 18 percent and worked with the Legislature to include \$500 million for facilities in the 2006-07 education bond. With advancing technology, equipment and facilities will be an ongoing issue requiring careful leveraging of resources across the K-12, adult school, and community college systems.

System Leadership

System leadership and subject area expertise at the administrative and consultant levels within the CDE and CCCCO are critical to ensure that CTE meets the demands of current and emerging industries. As mentioned earlier, in the past, such leadership was supported by Perkins funds, but shifts in funding allocations have restricted the support available.

Challenges to CTE becoming more of a demand-driven system include staying current and abreast of labor market demands and new occupational classifications, dealing with the complexities of industry partnerships, the lack of alignment among advisory committees, the lack of systematic processes or structures that would enable small businesses to communicate

their needs to educators and education systems, and **difficulties in reacting** nimbly to changes in the workplace or the economy. **The** high cost of many CTE programs, especially at the community college level where state-of-the-art equipment and facilities are imperative, where faculty must continually update their curricula, and where class sizes must remain small in order to ensure skill mastery, can impede the creation or expansion of programs in response to the demands of industry. Resources for state leadership in this area have diminished over the last decade.

Needed Actions

For the education systems to effectively meet the workforce demands of California industry, the following strategies are considered critical:

- Develop mechanisms to systematically track labor market demands, maintain the currency of occupational classifications, and ensure that teachers and counselors are informed of new developments in their fields.
- Encourage educational institutions to maintain close ties with their local communities to understand local workforce needs, quickly detect shifts in local labor market needs, and offer targeted and contract training.
- Encourage the identification of a single point of contact in educational institutions for industry, including the use of designated staff, liaisons, or other intermediary mechanisms as appropriate, at K-12, adult school, and community college levels within local and regional geographic areas.
- **Provide additional operational funds to support and expand CTE subject area expertise in the CDE and CCCCO in order to provide state leadership and technical assistance to the field on maintaining a demand-driven system.**
- Support and align advisory committees across the K-12, adult school, and community college systems at state and regional levels to examine labor market information and regional economic data on an ongoing basis.
- Encourage partnerships among local businesses and local workforce development and educational organizations.
- Identify and disseminate successful strategies employed increasing responsiveness to industry needs.
- Ensure sufficient funding for activities, such as program development, equipment, and faculty externships that would permit education to remain responsive to workforce needs.

Skilled Faculty and Professional Development

Key elements of quality CTE are the skill of its instructors and the existence of a sufficient pool of skilled instructors to adequately staff programs.

Definition and Significance

California's CTE faculty are required to be experts in many areas: the technical skills required in their fields, transferable essential workplace skills, and academic skills required of practitioners in their career areas. In addition, they must be exceptional teachers — able to use a multiplicity of strategies, ranging from didactic instruction to projects, simulations, hands-on applied performance, and supervision in the workplace — to facilitate learning. Further, they must know how to assess student performance in correspondingly varied ways. They must also be career guides, mentors, business liaisons, advisory committee chairs, coordinators of field placements, and employment coaches, as well as champions for both students and their own programs. Finally, they are held accountable for meeting the needs of students, schools, and industry. The task is daunting — and it changes constantly.

CTE instructors in California have proven that they are up to the task. However, many of them are close to retirement. Many also need additional support as they juggle the multiple new roles required of them. New instructors are needed to address the growing needs of industries and occupations that have recently come into existence, as well as to respond to the needs of a new generation of students — learners who are more comfortable with the Internet than they are with pens and paper. Finally, instructors are needed who can take on the new challenges of working with a diverse increasing population of lifelong adult learners.

These demands require a concerted innovative strategy of faculty recruitment, preparation, support, and ongoing professional development, with emphasis placed on both creating opportunities for mutual learning among faculty across disciplines, and providing real experience in the workplace. As emphasized in Perkins IV, professional development must be provided to CTE teachers, faculty, administrators, and career guidance and academic counselors, and must promote “the integration of coherent and rigorous academic content standards and career and technical education curricula, including through opportunities for academic and career and technical teachers to jointly develop and implement curricula and pedagogical strategies.”

This section of the plan addresses:

- Recruitment, qualifications, and retention of faculty
- Preservice preparation of faculty, counselors, and administrators, coupled with new teacher support
- Ongoing professional development of faculty, counselors and administrators
- Opportunities for ongoing learning among faculty and staff, including collaboration to enable cross-disciplinary integration

Current Key Activities and Initiatives

California is undertaking or exploring a variety of activities to facilitate recruitment of skilled CTE faculty and professional development to strengthen CTE programs.

Faculty Recruitment, Qualifications, and Retention

Teacher and faculty recruitment in CTE is particularly challenging because teachers need both industry knowledge and pedagogical skills. They must possess integrated technical, workplace, and academic knowledge and skills, and know how to convey this knowledge and facilitate skill development using multiple instructional and assessment strategies.

Currently, each of the major segments of CTE has varying requirements for individuals to become instructors. In the K-12 system, teachers must hold bachelor's degrees and meet a variety of other requirements in order to obtain single subject or multiple subject credentials and meet the criteria for "highly qualified" teacher status in NCLB.¹¹⁹ CTE instructors with single subject credentials must hold bachelor's degrees and complete their fifth year of education in a CTE career area; they may also be required to demonstrate direct experience in industry, depending on the career area.

CTE instructors may also be hired with designated subjects (DS) credentials. DS credentials do not require a bachelor's degree, but rather a high school diploma and industry experience in the previous five years. While these instructors do not meet the criteria for "highly qualified" teachers in NCLB, their industry experience is considered to be highly valuable. Schools that seek to recruit industry representatives as teachers in their CTE programs may do so through the mechanism of the DS credentialing process. A potential drawback to doing so, however, is that, while industry representatives have content knowledge, without teaching experience or training in pedagogy, they may not be effective in imparting their knowledge to students.

The California Commission on Teacher Credentialing (CCTC) is currently developing the requirements for these new credentials that will be aligned to the credential subject areas of the 15 industry sectors identified in the California CTE Model Curriculum Standards, replacing the approximately 175 designated subject credentials currently offered in very specific occupations. By reducing the list of authorized subjects to 15 broad categories, this bill will provide employer districts with more flexibility and allow credential holders to teach more courses within a sector category.

In addition, the CTC is reviewing requirements regarding the hiring of part-time CTE teachers, who are greatly needed. Typically, these are individuals with current experience who are willing to teach one or two classes a year. Their familiarity with industry trends, technology, and practice help ensure that the content for CTE courses is relevant and the skills students learn are the ones employers need. Yet the current structure limits the schools' flexibility to assign additional classes to part-time teachers, and creates barriers that discourage skilled and talented individuals from teaching opportunities.

Community college CTE instructors must meet minimum qualifications that are based on a combination of degrees and industry experience. CTE instructors must have a bachelor's degree or associate degree. In order to teach with a bachelor's degree, individuals must have

¹¹⁹ CTE instructors with single subject credentials only need to meet the "highly qualified" teacher status if their courses are considered core academic classes that can be used to meet graduation requirements.

two years of experience in their career area; with an associate degree, they must have six years of experience.

As mentioned in earlier sections, counselor training programs focus predominantly on academic counseling, rather than on career counseling. In addition, many counselors lack direct experience in the workplace outside of the education sector.

Challenges to recruiting and retaining staff include low pay compared to the private sector; an inadequate supply of individuals who have the breadth of skills required; inadequate supply of credentialing programs, exacerbated by the currently cumbersome and extensive credentialing process that deters otherwise skilled professionals from becoming teachers; difficulties in retaining faculty for part-time positions; challenges in recruiting staff for positions in rural areas; and pressures on staff due to a continual need to re-train to keep pace with trends in industry.

In addition, beginning CTE instructors often do not receive adequate support. Beginning Teacher Support and Assistance (BTSA) programs often do not exist for beginning CTE instructors, nor do existing BTSA programs generally incorporate support in areas that would provide CTE teachers with subject-area support, strengthen integrated strategies, or facilitate collaboration between CTE and non-CTE instructors. In community colleges, support systems like BTSA often do not exist at all.

Preservice Preparation, Professional Development, and Collaboration

Generally, professional development in CTE is offered through professional and industry conferences. Teacher externship and job shadowing opportunities are highly valued by those who have experienced the benefits they provide, but there is a much higher demand for these opportunities than there are opportunities available. Teachers particularly value time to collaborate.

At the K-12 level, CDE staff have provided both professional development and targeted technical assistance to CTE practitioners in the field. Plans are currently underway to provide professional development specifically to facilitate implementation of the CTE Model Curriculum Standards and Framework, given that many CTE instructors have expressed interest in receiving guidance on curriculum integration and standards-based instruction in CTE.¹²⁰

CTE-focused professional development can be valuable for non-CTE faculty, counselors, and administrators as well. While, in the K-12 system, non-CTE teachers may have single subject or multiple subject credentials, in many cases, they do not have extensive experience in the workplace outside of education, and preparation programs do not emphasize knowledge of workplace needs, career development issues, development of integrated curriculum, integrated teaching strategies, multiple assessments, team teaching, or collaboration with community-based agencies or businesses — all topics that would promote effective collaboration with CTE and preparation of young people for their future endeavors. Similarly, greater exposure to the needs of the workplace could also enhance administrators' ability to provide vision and leadership in CTE.

At the community college level, professional development is offered through the Community College Advisory Committees and collaboratives, Academic Senate, Regional Consortia, content area conferences, and sabbaticals. Colleges also pay for “flexible professional

¹²⁰ A Statewide Assessment of California's Career Technical Education System. (2006). WestEd.

development”, called “flex”, whereby faculty participate in at least five days of professional development activities each year to strengthen their programs. In addition, the CCCCO also offers professional development on special topics, such as integrating curricula, effective practice in developmental education, and assessing student learning. Initiatives reflecting system priorities are usually addressed through professional development offered in approximately 16 two- or three-day workshops during the year. The CCCCO has covered faculty stipends and substitutes; so that colleges can then use Perkins funds to train large groups of faculty on their campuses.

Finally, SB 70 supports faculty professional development through teacher externships, a strategy demonstrated to be highly effective in informing educators about the needs of the workplace.

Needed Actions

The following strategies are critical to ensuring that students have access to the most capable faculty and that there is sustained recruitment and preparation of CTE faculty to meet growing needs:

- Develop strategies to recruit and prepare industry representatives who may want to enter the teaching profession.
- Expand and promote effective and innovative models of CTE teacher preparation to meet the CTE teacher shortage, including the expansion of teacher preparation programs in the community colleges, articulated with the California State University system.
- Identify and encourage students in CTSOs who may be interested in teaching CTE within their area of career interest.
- Provide mentoring and support programs for all new CTE instructors, ensuring that instructors have both the content and the pedagogical skills required.
- Provide in-depth professional development in the implementation of the CTE Model Curriculum Standards.
- Expand professional development to incorporate high-priority topics and strategies, including curricular integration, collaborative strategies, career development, work-based learning, specialized strategies to effectively serve special populations, diverse learners, and adult students, and the collection and use of data for program improvement.
- Include counselors, non-CTE faculty, and both CTE and non-CTE administrators in CTE professional development whenever possible to foster mutual understanding and alignment of efforts toward the common goal of preparing all students for success.
- Promote and fund job shadowing and externships for both CTE and non-CTE faculty, counselors, and administrators to provide direct exposure to the needs of the workplace and the skills required for student success.

- Promote and fund support for CTE and non-CTE faculty to learn from one another and to collaborate in the development of curricula, in team teaching, and in forming and strengthening learning communities.
- Promote and fund support for CTE faculty to collaborate with industry representatives in the development and delivery of curricula.
- Incorporate CTE teacher preparation programs into CSU/UC programs and promote the building of contextual teaching skills in master's degree-level programs.
- Promote the sharing of model integrated curricula and strategies and ongoing learning among educators through conferences and electronic tools.

Evaluation, Accountability, and Continuous Improvement

Evaluation and accountability are key to any system or program improvement process and feature prominently in Perkins IV. Multiple accountability systems already exist in California to provide data that both meet specific requirements at the federal and state level and support program improvement efforts. These include systems mandated by NCLB, the Carl D. Perkins Act, and the Workforce Investment Act, as well as state systems designed to provide an Academic Performance Index for schools; ensure continued funding for high-quality, high-demand community college programs; and assess compliance with the requirements of many different individual programs in both segments. This multiplicity of existing accountability systems complicates the intended integration of CTE into the very fabric of educational policy as a strategy to serve all students. That is, any discussion of CTE accountability must focus on using, aligning, and expanding upon existing systems, and must emphasize program improvement along with the reporting of compliance-driven data. Similarly, to the extent that such a system (or collection of systems) is intended to drive improvement in CTE for the benefit of all its customers — students, businesses, communities, and taxpayers statewide — it must report progress on measures that are meaningful to each of these groups.

Definition and Significance

The CTE resource group highlighted accountability as a key driver for CTE program improvement, echoing the National Council for Workforce Education (NCWE) message that planning and accountability are key features in the creation of a seamless system to ensure student success in both education and careers. Establishing any program improvement system requires:

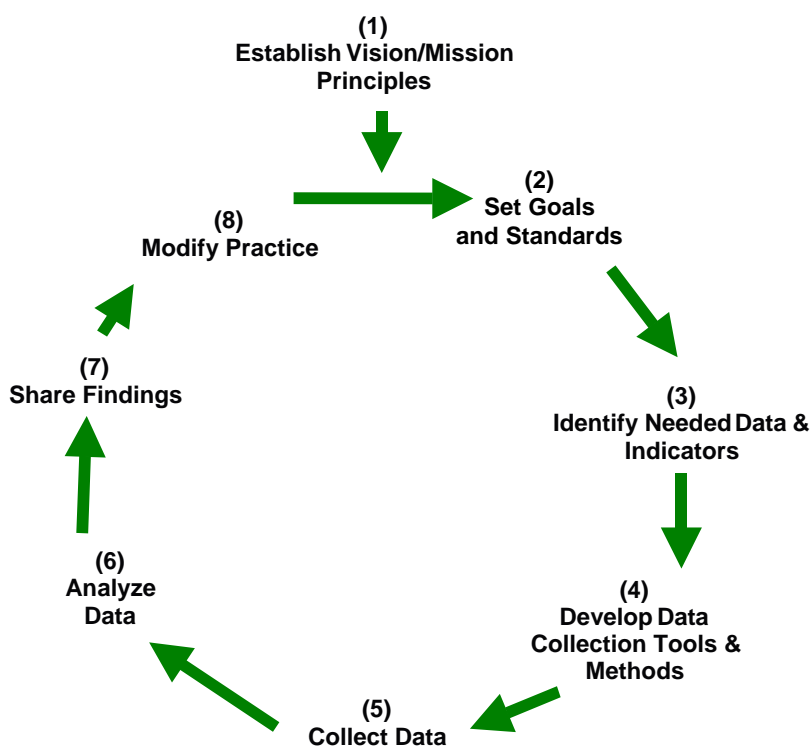
- Agreement about goals and standards
- Identification of needed data and indicators based on the agreed upon goals and standards
- Identification and, if necessary, development, of data collection tools and methods, including appropriate assessments and databases
- Collection and analysis of data
- Sharing of findings with customers, practitioners, and policymakers

- Implementation of improvement strategies

Establishing such a system in CTE is more complex than in other aspects of education because CTE serves both students and industry; it is intended to prepare students for further education **and** career success, while providing the economy with a skilled workforce. Any metrics established must therefore be understood by business and non-educational partners, as well as by educators. It is further complicated by the fact that CTE focuses on long-term outcomes, including long-term career fulfillment across multiple career transitions and long-term economic prosperity for the state. Finally, implementation of a useful system requires attention to both local and state progress indicators — the latter being greater than the simple sum of the local efforts.

Despite these complexities, with sufficient clarity of purpose and the participation of both education and industry, measures and systems can be established to gauge progress in CTE at both the local and state level, and to identify the mechanisms required to adjust performance as needed.

Figure 9. The Program Improvement Model



Current Key Activities and Initiatives

California implements a variety of accountability, data collection, and assessment systems. For the most part, data are currently collected and analyzed primarily for compliance with the requirements of specific, discrete funding streams. Analysis of student outcomes in CTE has

been driven in large part by the requirements of the Carl D. Perkins Act. However, progress is being made in expanding the collection and use of data in more integrated ways — across time, across programs, and across educational segments — in order to produce a clearer picture of how well California's educational system is serving all students.

State Accountability Systems

The K-12 system implements the Standardized Testing and Reporting (STAR) system to measure student performance and determine school and district achievement of both state and federal performance requirements. In addition, the California High School Exit Examination (CAHSEE) was implemented for the first time in 2004 to ensure that students graduate from high school with the academic skills required for success after high school. The CAHSEE and STAR data are used by the state to establish a rating of schools, called the state Academic Performance Index (API)¹²¹ and are also used by the federal government under NCLB to determine schools' average yearly progress (AYP) rating. Under Perkins IV, CTE students' academic achievement will also be captured based on CAHSEE scores.

In 2001, the California legislature amended the planning requirements for schools that participate in state and federal categorical programs funded through the Consolidated Application process, creating the *Single Plan for Student Achievement* (SPSA).¹²² The purpose of the SPSA is to "improve the academic performance of all students to the level of the performance goals, as established by the Academic Performance Index."¹²³ The requirements for monitoring these categorical programs are part of the same legislation. The SPSA planning process and local compliance monitoring are directly related. The legislation established eight requirements for school plans. Among these are the requirement that school site councils develop and approve the plans, and that the contents of the plans be aligned with school goals for improving student achievement. As mentioned above, although Perkins funding is not allocated as part of the Consolidated Application process, NCLB Title I funds are. One of the requirements of Title I is coordination with other federal programs, including Perkins, and Perkins legislation, in turn, requires coordination with NCLB. These requirements for reciprocal coordination suggest that activities funded with Perkins funds be included in the SPSA and monitored accordingly.

Schools are required to complete yearly School Accountability Report Cards (SARCs), which provide parents and the community with information on demographics, academic achievement, fiscal areas and expenditures, school completion rates, class sizes, teachers and staff members, CTE participation, and postsecondary preparation.

Since the late 1980s, student outcome performance reporting at the college and college program level has been designed and made available to facilitate analysis that could identify performance gaps for purposes of local program improvement and for targeting state resources. Recently, the community colleges implemented the Accountability Reporting for Community Colleges (ARCC), mandated by California State Assembly Bill 1417 (Pacheco) ARCC provides a framework for annual evaluation of community college performance in meeting statewide educational outcome priorities. ARCC reports on such indicators as course completions, grades by type of course, degrees and certificates awarded, and employment and earnings.

¹²¹ Information on the API can be found at <http://www.cde.ca.gov/ta/ac/ap/> on the Web site of the California Department of Education.

¹²² A Guide and Template for The Single Plan For Student Achievement: A Handbook for School Site Councils, November 2006. Accessed November 6, 2007 at <http://www.cde.ca.gov/nclb/sr/le/documents/spsaguide.doc>.

¹²³ California *Education Code* (EC) Section 64001(a).

The community colleges also employ a number of other performance reporting processes. Some examples include local program performance review for annual budget requests, biennial program reviews required by Title 5, Perkins performance reporting and program improvement analysis, reporting for college accreditation through the Western Association of Schools and Colleges, and the annual Integrated Postsecondary Education Data System reports.

Under the Perkins Act, CTE programs in both segments are required to track students' academic achievement, technical skill attainment, successful transitions to further education, employment, military service or apprenticeship programs, and participation in nontraditional programs, among other measures. In all of the Perkins accountability measures, individual programs and the state as a whole must meet negotiated levels of performance.

Goals and Standards

Currently, the CTE Model Curriculum Standards and Framework, established for CTE programs in grades 7-12, serve to provide the knowledge, skills, and competencies that students are expected to attain in CTE, including both foundation standards based on the SCANS skills that undergird all pathways, and specific pathway standards. At the K-12 level, the CTE Framework provides a model for the development of assessments based on the Model Curriculum Standards that can measure the attainment of these skills. The CTE standards can also provide the point of departure for a statewide discussion on the essential skills that all students need to attain in order to be successful in the 21st century. In addition, K-12 CTE students are held to the state-adopted academic content standards in English language arts, mathematics, history-social science, science, physical education, and visual and performing arts.

In the community colleges' occupational courses, industry drives both the standards as reflected in model course outlines required for all courses, and the assessment tasks that allow students to demonstrate attainment of those standards. The processes put in place at the community colleges to ensure rigor and content currency are specified in Education Code, Title 5, and in CCCCCO requirements, and are carried out at three levels:

1. College curriculum committees approve new courses and programs.
2. Regional consortia review and approve new programs to verify labor market demand to avoid destructive competition.
3. The CCCCCO provides guidance and manages a process to approve all new and modified stand-alone courses and programs.

Title 5 regulations for occupational programs require biennial review and documentation of sufficient labor market demand, student enrollment and completion, and student employment. Programs not meeting sufficiency in these areas are required to be terminated within one year.

Data and Indicators

Data to ascertain student performance and other outcomes in CTE depend on both accurate student and course information as well as appropriateness of the indicators used to measure outcomes.

Student Data. Student data at the K-12 level and in adult schools are currently captured in

school district databases. Data include demographic information, grades, test scores, and whether students have completed “a-g” course sequences, among other information. Data on the completion of CTE course sequences are not currently captured. Student “identifiers” or codes are assigned by the enrolling district. Students do not currently have unique identification numbers that would allow for following students from one district to another, between the district or the ROCP, or from one segment to another over time.

At the community college level, student data are submitted to the CCCCCO and stored in a single statewide database.

Course Data. Currently, in the K-12 system, courses are coded in the California Basic Educational Data System (CBEDS) as either CTE or academic. Some courses meet the criteria for both categories and the number of these courses is increasing. Counts of student enrollments in CTE must draw from both the CTE course list and those courses listed as “academic” that also meet the criteria for CTE courses. These CTE course criteria include:

1. Course and its curriculum explicitly designed to prepare students with career skills that lead to employment, whether after high school or after postsecondary education
2. More than 50 percent of the course curriculum content consisting of career knowledge and skills
3. Business and industry directly involved in the development and validation of the curriculum.

In the community colleges, courses are coded by the degree to which a course is considered “occupational,” ranging from Apprenticeship, Advanced Occupational, Clearly Occupational, Occupational, Possibly Occupational (introductory courses), or Non-Occupational. The criteria for defining each of these levels of CTE are provided in the CCCCCO Data Element Dictionary.

In Tech Prep, student participation is determined by the completion of sequenced, articulated CTE courses within a particular industry sector at both the secondary level (including both high school and ROCP courses) and at the community college level. A CTE course sequence in high schools and ROCPs is defined as two year-long courses or 300 hours of instruction in the same industry sector. Accurate counts depend on clear definitions of CTE courses and the courses allowable in a course sequence.

Indicators. As described above, secondary accountability measures such as API and AYP are based on academic achievement in reading/language arts and mathematics as measured by paper and pencil tests. Such indicators pose some challenges for measuring CTE outcomes. For example, Perkins accountability in the area of academic attainment is now aligned with NCLB requirements, which, like AYP ratings in California, are based on the CAHSEE. The CAHSEE assesses student achievement in reading/language arts and mathematics in the 10th grade for most students, but the fact that many students do not enroll in CTE coursework before the 11th grade makes it difficult to associate these results with CTE programs.

Specific CTE indicators will be added to other existing systems, such as the California Longitudinal Pupil Achievement Data System (CALPADS), which was designed to meet the requirements of NCLB. To allow for a more comprehensive view of student achievement, CALPADs will be expanded, as funding becomes available, to address the needs of CTE by including CTE data elements, such as participation of students in CTE course sequences. (See

CALPADs description below under the section titled Data Collection Systems.

The community colleges have identified key indicators of performance and a recommended program improvement process, as described in the *Instructional Program Improvement Resource Guide*.¹²⁴ Indicators fall into four areas: access, resources, efficiency, and program success. The core indicators reported to meet requirements of the Perkins Act fall into the “program success” category of indicators but represent only a fraction of the indicators that should be considered when implementing a comprehensive program improvement process.

The community colleges’ management information system (MIS) captures grades, course completions, and the granting of certificates and degrees. In addition, CTE student enrollments and specific outcomes are documented and reported, including: academic and technical skill attainment; transitions to further education, military service, and apprenticeship; and employment and earnings. Some reporting issues have yet to be resolved. For example, the current reporting systems do not distinguish between students who leave programs for employment (a positive outcome) and those who leave for other reasons. Although it is important to understand that students leaving courses became employed, related information on course completions also allows colleges to strengthen their communications with students on the importance of completing courses and programs. **The link between employment and course and program completion allows colleges and faculty to assess program impacts. The system also provides** for detailed analysis of student outcomes by special population groupings for all indicators as well as for analysis of outcomes at the introductory versus advanced coursework levels.

Assessment Methods

Success in CTE and in careers — or even in the component projects and activities that make up a rich CTE program — is best measured through multiple assessments, including completion of industry-driven and performance-based tasks, presentations, portfolios, and direct feedback from employers. In CTE, performance-based tasks are often used to assess student learning. In addition, “technical skill assessment that is aligned with industry-recognized standards, including the California CTE Model Curriculum Standards” will serve as the basis for assessing “technical skill attainment” for Perkins reporting at the secondary level. At the postsecondary level, grades attained in occupational courses — reflecting the outcomes of performance-based and other assessments — serve as the measure of “technical skill attainment” for Perkins reporting. **Student technical skill attainment, progression through course sequences, and program completion are good predictors of employment and earnings.**

Data Collection Systems

Currently, **most** K-12 data are collected in the CBEDS system, with CTE data collected, in addition, **through** the Perkins data system. While it is currently impossible to follow a student over time or across schools, efforts are underway to implement the California Student Information System (CSIS) that will provide a unique and confidential student identifier for students, enabling the system to follow students’ progress from one program, district, or educational system to another. In addition, the California Longitudinal Pupil Achievement Data System (CALPADS), a relational database that allows for analysis of student outcomes, will be implemented in 2008-09 as the foundation of California’s K-12 education data system.

¹²⁴ http://www.cccco.edu/divisions/esed/cte/resources/faq/pirg-full_doc.pdf.

CALPADS will collect student-level data on demographics, program participation, and course completion. Teacher-level data will include course assignments. CALPADS will eventually replace a number of the CDE's current aggregate collections, including the CBEDS collections, the Language Census, Student National Origin Report, and portions of the Consolidated Application. CALPADS will also reduce the amount of data collected on the answer sheets of statewide assessments.

The California Community Colleges' Management Information System (MIS) was designed to provide for efficient and systematic reporting to meet the full spectrum of local, state, and federal requirements, and is therefore intended to be a comprehensive system. For example, the MIS includes student Social Security and other ID numbers and allows for analysis of both course enrollments and transitions to further education and employment. The CCCCO also maintains a "Datamart" and Perkins Core Indicator report system on its Web site that allows researchers and community members easy access to innumerable reports and data. One of the key advantages of this system is that both funding and accountability are driven from the same data, ensuring accuracy and timeliness of the data.

In addition, efforts are underway in many regions of the state to measure progress from secondary to postsecondary education through the California Partnership for Achieving Student Success (Cal-PASS). Cal-PASS began as a local initiative in one county to collect, analyze, and share student data in order to track performance and improve success from elementary school through university. Use of the Cal-PASS system is voluntary, but more than 2,000 elementary schools, high schools, community colleges, colleges, and universities from more than 25 counties now participate in this partnership.

Intermediate Measures of Systemwide Improvement and Evaluation Efforts

In addition to measuring outcomes, intermediary process measures are required, both at the local or state level, to ascertain progress in system development. Some steps are being taken in this direction. For example, the CDE is identifying the distribution and quality of some career pathways throughout the state. The University of California Office of the President tracks the number of CTE courses that have been approved as meeting the "a-g" requirements for university admission, and California Partnership Academies and other learning communities are also evaluated regularly with regard to their structures and levels of student participation, in addition to their student outcomes.

At the community college level, evaluation efforts have begun to measure progress in SB 70-funded career pathway and career exploration projects throughout the state, and the Academic Senate of the community colleges is identifying replicable articulation agreements. Tech Prep programs have also been evaluated. In addition, every year, the six discipline-industry collaboratives evaluate student outcomes and program performance at the statewide level in their specific areas. These analyses inform the development of funding priorities for the following year's activities within the industry or collaborative area. Collaboratives often leverage state (e.g., SB-70 and Economic Development) and federal (e.g., Perkins and WIA) funds. However, for the most part, all of these efforts have been carried out separately, driven by their respective funding sources, and the requirements to track the funds separately, as well as by discipline/industry needs. Few overarching measures of system development have been identified, or processes put in place, to monitor system improvement or how well the system meets statewide priorities on an ongoing basis.

Communication of Results

Currently, CDE-collected student and school data are publicly available through reports, online Web sites and School Accountability Report Cards at levels of aggregation that ensure individual students' anonymity and privacy. Teacher data are primarily collected by agencies that operate and report independently of CDE and cannot currently be linked easily to school and student information.

Community college reports and nonconfidential data files are publicly available through the community college system online Web sites, and written reports. In addition, each of the accountability systems mentioned previously requires an analysis of the data in annual submissions of planning documents.

Implementation of Improvement Strategies

According to a recent RAND Corporation study, "The state has not developed a 'culture of data' that emphasizes the necessary connection between good data and school improvement efforts. California has not created strong incentives for school districts to care about the substance and quality of the data they provide to the state."¹²⁵ Currently, the CDE monitors grantees of Perkins funds for compliance with Perkins regulations and to ensure that programs are meeting their targeted performance levels. Local recipients are required to review their local levels of performance within their annual Perkins application. Districts that have not met the state-required levels of performance must submit an improvement plan, describing both why they have not met performance requirements and their planned actions for improving performance. State staff also provide technical assistance as needed and when requested. However, resources are limited for additional technical assistance to ensure program improvement.

Program improvement in the community colleges is driven by a number of forces ranging from accreditation to funding. Perkins funds are used to improve CTE programs that result in increased student success. College programs receiving Perkins funds must describe the how the funds will be used for program improvements that result in increased student success. Collaborative efforts among the CCCCO, the research and planning group for the California community colleges, regional consortia, local districts, and experts in the fields of academic-CTE integration and assessment of student learning have resulted in a variety of improvement efforts. These have included the development of instructional program improvement guides, institutes and conferences focused on improving student success, workshop materials and practicums for delivering research-based staff development, Web sites featuring effective practices, and multimedia resources designed for facilitating program improvement.

Needed Actions

In this era of accountability, and given the new requirements of Perkins IV, increasing attention will be placed on CTE's role in improving student achievement in a variety of arenas. CTE can lead the way in identifying outcomes that are relevant to successful adulthood and careers, valid means to assess attainment of those outcomes, the tools and systems required to collect and analyze data, and the processes necessary to ensure continuous system improvement. It must simultaneously provide data that are relevant to workforce and economic development needs

¹²⁵ Education Data In California: Availability And Transparency. Janet S. Hansen. Senior Policy Researcher, the RAND Corporation. A Paper Prepared For The "Getting Down To Facts" Project. November 2006.

and systemwide improvements.

The following strategies have been identified as critical to accomplish these aims:

- Articulate a vision of CTE and its significance to both immediate and long-term student success that is persuasive to educators across both segments.
- Obtain broad consensus on the goals of CTE and develop measurable objectives that will drive system development and improvement.
- Work with industry members, educators, parents, and community members, obtaining broad consensus on the knowledge, skills, and attitudes that all students should master throughout their educational endeavors as measures of “work readiness.”
- Implement a secure student identifier system that allows the CTE system as a whole to follow the progress of students across programs, segments, and education/employment sectors.
- Expand state secondary accountability measures, such as the API, to include CTE measures; include CTE in the accountability process required for the *Single Plan for Student Achievement*.
- Include additional outcome data elements in all data systems, to the extent appropriate and possible, that would shed light on student and program performance; for example, the results of licensing examinations and other industry-based certifications that could be linked to student data.
- Implement the California CTE Model Curriculum Standards for grades 7-12 statewide and use them as the basis for the development of valid traditional and performance-based assessments in each of the 15 industry sectors, aligned with assessments conducted at the community college level.
- Identify statewide industry standards, as appropriate, to guide both secondary and postsecondary curriculum development.
- Align data collection and reporting systems across programs and segments to follow student performance over time.
- Provide evaluation and program improvement tools and guidelines to local agencies to promote comparability of data and statewide benchmarking of improvements.
- Provide resources to both CDE and CCCCO to facilitate data collection, data analysis, and technical assistance to local agencies.
- Provide professional development to practitioners in the collection and use of data, and disseminate models of effective practice and information on effective program improvement strategies.
- Allocate sufficient funding for system development, data collection, data analysis, and professional development in the use of data for program improvement.

CTE Promotion, Outreach, and Communication

CTE offers myriad benefits to students, employers, state and regional economies, and communities. In order to ensure continued support for CTE, its benefits must be validated and made more widely known to students, parents, educators, counselors, community members, and policymakers. This plan makes explicit the need to clearly communicate the benefits of CTE to each of these groups based on evidence of its impacts.

Definition and Significance

Recent educational priorities have diminished the visibility of CTE and the ways it can contribute to academic success, personal development, career preparation, and secure employment. In addition, CTE has not conveyed a clearly articulated, consistent message about the benefits it confers to students, communities, industry, and the economy, and how CTE has **worked to remain relevant to modern students and employers**. This, combined with other factors, has contributed to decreases in high school CTE enrollments, which, in turn, result in students' lack of preparation for higher levels of CTE and lost opportunities to use CTE as a strategy to improve student learning, persistence, graduation, and transitions to postsecondary opportunities and work. Decreasing enrollments also impact the availability of a skilled labor force for an increasingly competitive economy.

CTE promotion, outreach, and communication encompass:

- Demonstrating how CTE promotes student achievement, including success on standardized tests, and contributes to enhanced student outcomes and long-term success
- Promoting communication among CTE and non-CTE faculty
- Communicating broadly with students, parents, community members, and policymakers
- Ensuring that all administrators and counselors understand the benefits of CTE
- Ensuring that students get the information they need about CTE programs at key decision points in course selection and career development
- Ensuring that students are aware of the wide array of leadership and learning opportunities available through CTSOs
- Communicating with incumbent workers about the training opportunities available to them in CTE programs
- Generating political will for further support and resources
- Expanding and strengthening outreach efforts to encourage teaching in CTE as a profession

Current Key Activities and Initiatives

CTE at the K-12, adult school, and postsecondary levels implements varying promotional, communication, and outreach strategies.

In the K-12 system, individual programs promote CTE through written materials, and conduct outreach or produce special events to inform students about career academies, pathways, courses or career-related events and encourage their participation. Counselors inform students about CTE, though schools and counselors sometimes prioritize other programs. ROCPs that serve high school students often promote their programs through the high school career centers, if such centers exist, but some counselors are not aware of the variety of ROCP courses available to students in their communities. Adult ROCP and adult school programs promote their programs directly to the community. Promotion of and enrollment in CTE is facilitated by the creation of learning communities that incorporate both CTE and non-CTE courses, thus reducing the need for students to choose between CTE and non-CTE courses. Communication between CTE and non-CTE teachers and between teachers and counselors or other support staff is also facilitated by participation in learning communities, **but does not occur systematically when learning communities are not in place.**

In the community college system, the CCCCO has created a variety of public service announcements to facilitate individual colleges' communications with the public and provides a searchable database on its Web site to assist the public in finding programs and courses. Promotional activities also occur through each of the ten community college advisory committees. CTE programs develop their own materials at the college and regional level; every region has a Web-based program to enable the public to view courses available in their region. Colleges also conduct career days, bringing high school students onto campuses, where they have the opportunity to talk with community college students.

Where learning communities exist in colleges, they promote communication among faculty and staff. However, beyond these structures, communication between CTE and non-CTE faculty is somewhat limited.

In addition, in both secondary and postsecondary segments, while programs communicate with the public in order to recruit students to their programs, with few exceptions, the *benefits* of CTE programs have not been made widely known to educators at large or to the public in any systematic way across the state since the termination of school-to-career funding in 2003. Further, in the current era of accountability and increased global competitiveness, CTE needs to demonstrate and trumpet its role in engaging students in learning and promoting high academic achievement, as well as in the development of students' technical and workplace skills.

Needed Actions

To ensure full participation of students in CTE from K-12 through adult school and postsecondary education, stakeholders have determined that the following strategies are critical:

- **Make CTE and its benefits — including its role in promoting student engagement and achievement — more visible to students, to parents at all levels, to other educators, including non-CTE faculty and counselors, and to the public at large.**

- Promote communication among CTE and non-CTE faculty, counselors, guidance staff, and administrators to foster understanding and the development of a shared vision for student success.
- Work with statewide stakeholders to craft a message about CTE that is clear, coherent, and can galvanize interest in and support for CTE programs.
- Ensure that counselors are fully informed of the CTE resources and support services available to students in their schools and colleges.
- Engage business organizations to communicate with educators and students about the value of CTE programs and encourage participation.
- Review policies and practices that may pose barriers to full implementation of CTE.
- Base promotion efforts on data-driven evidence of success.

Summary

California seeks to build a world-class, demand-driven CTE system to serve all students, from young people first exploring possibilities to adults seeking to update their skills or change careers. The state envisions a CTE system that is fully embedded within California's education system, K-16 and beyond, promoting economic development and providing students with the full range of knowledge and skills necessary to become successful contributing members of society. To realize this vision, strategies have been proposed in the following 11 areas:

1. Leadership at all levels to both articulate and champion the realization of a renewed vision for CTE
2. Development and implementation of high-quality and integrated curricula and instructional strategies, including classroom-based and work-based learning, to engage and facilitate learning and link students to workplace opportunities
3. Career exploration and guidance to ensure that all students can imagine a full range of life possibilities and manage their careers to realize their dreams
4. Student support and student leadership development to ensure that all students succeed and achieve their full potential
5. Effective industry partnerships to ensure relevance of curricula to the workplace and to facilitate linkages of students and educators to workplace knowledge and experiences
6. System alignment and coherence to ensure students' smooth progression throughout their educational and career pursuits and to maximize the efficient use of system resources
7. Effective organizational design to facilitate integrated teaching and learning strategies, including faculty collaboration, and to ensure that all students have access to CTE programs

8. System responsiveness to changing economic demands to ensure that employers' workforce needs are addressed in timely ways and that education contributes to continued economic prosperity
9. Faculty recruitment, preparation, and professional development to ensure that there is an adequate supply of qualified faculty who are knowledgeable in their technical areas as well as in the academic competencies and workplace requirements essential to their fields, and who are also skilled instructors
10. Evaluation and accountability to ensure that the CTE system is meeting its goals and to promote continuous program improvement
11. Program promotion, outreach, and communication to ensure that students, parents, educators, and communities are aware of the opportunities and benefits offered by CTE

In addition, the resource group and other stakeholders emphasize the importance of addressing the needs of all students, including young children for whom CTE can open endless future possibilities, youth searching for careers and identity, young adults seeking competence and their place in the world of work, and re-entry and incumbent workers seeking new skills and options. Inclusion means serving all individuals seeking to fulfill their career aspirations and contribute to the well-being of society. To achieve this aim, both visionary leadership and adequate resources are necessary at all levels.