

A STATEWIDE ASSESSMENT OF CALIFORNIA'S CAREER TECHNICAL EDUCATION SYSTEM

Executive Summary

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EXECUTIVE SUMMARY

INTRODUCTION

The “flattening” of the world — a metaphor used by Thomas Friedman in his 2005 book, *The World is Flat*, to describe economic globalization — is not a new phenomenon, but has become increasingly visible since the 1980s. This phenomenon and the resulting changes in the workplace are requiring commensurate adjustments in our educational systems, if the U.S. is to remain competitive. Professors Murnane and Levy, authors of *The New Basic Skills*, writing in 1996, asserted that “the skills required to succeed in the economy have changed radically, but the skills taught in most schools have changed very little.” A decade later, the U.S. Chamber of Commerce, in its paper “Global Engagement: How Americans Can Win and Prosper in the Worldwide Economy” (2006), describes our increasing dependence on foreign-born workers at all skills levels. The Chamber cites improvements in K-12 schools and career technical education as key to ensuring that American workers are competitive and economically secure in this new world.

In California, career technical education (CTE) is stepping up to the challenge of meeting both student and workplace needs. As an integral component of public secondary and postsecondary education, CTE is designed to educate students about, through, and for careers. California, as the sixth largest economy in the world, is a major player in the global marketplace. As such, it is striving to provide its students — whether children first exploring options or adults retraining for new careers — a world-class career technical education system, one that both informs and is informed by best practice in education, as well as by input from employers and the community.

The purpose of this study is to examine the status of CTE in California and explore opportunities for strengthening the CTE system as a whole. The expected reauthorization of the Carl D. Perkins Vocational and Technical Education Act of 1998, which provides over \$140 million annually in funding to improve California’s career technical education programs, catalyzed this study. Congress reauthorized the act in August 2006, renaming it the Carl D. Perkins Career and Technical Education Improvement Act of 2006. The 2006 Act will require a new State Plan for the use of future funds. One purpose of the needs assessment, therefore, is to identify and document potential system improvements to provide direction for California’s 2006 State Plan. Equally, if not more, important is the surfacing of issues, solutions, and effective practices that can inform improvements in CTE that may be implemented through any number of initiatives, all working toward the creation of a coherent and comprehensive CTE system.

Specifically, this study seeks to answer two major questions:

- 1) *What is the status of CTE in California and what are the major trends?*
- 2) *What resources and system improvements are essential at the state and local levels to ensure that CTE meets the current and evolving needs of students, communities, and the economy?*

To answer these questions, WestEd first conducted a literature review on CTE trends in California and nationally, and then elicited input directly from the field through a survey of stakeholders, as well as focus groups and interviews.

The survey received 1,311 responses in the following categories:

- Administrators (409 responses)
- CTE, Vocational, or Occupational Instructors (592 responses)
- Academic Only (Non-Occupational) Instructors (165 responses)
- Counselors/Career Advisors – School/College-Based (85 responses)
- Counselors/Career Advisors – Community-Based (13 responses)
- Business/Industry (47 responses)

Seventy-one people participated in focus groups or interviews in the following categories:

- Administrators and staff representing “special populations” groups¹ (6 participants in one group)
- Representatives from economic and workforce development and industry organizations (9 participants in one group)
- Administrators of high schools, community colleges, Regional Occupation Centers and Programs, and adult education programs (6 participants over two groups)
- CTE instructors (6 secondary CTE instructors in one group; 9 postsecondary CTE instructors in another group)
- Counselors/Advisors (6 participants over two groups)
- CTE students, identified by instructors, staff or advisors of their respective CTE student organizations (27 student participants over 5 focus groups)
- Parents (one interview each with a parent of a CTE student and with a leader of the California PTA)

THE CTE DELIVERY SYSTEM

Career technical education in California is provided through a variety of models and educational structures that, taken together, span a wide array of contexts, from elementary education through continuing learning opportunities for adults. For the purposes of this needs assessment, the CTE delivery system is defined as career-related programs and services offered through the public education system and administered through both the California Department of Education (CDE) and the California Community Colleges (CCC), including the CCC Workforce and Economic Development Program, as follows:

- Elementary and middle school programs, when available, are intended to introduce children to options beyond school in order to help them see the importance of learning as it relates to future careers.

¹ Special populations for the Perkins Act include Single Parents, Displaced Homemakers, Economically Disadvantaged Students, Limited English Proficient Students, Students with Disabilities, and “Nontraditional” Students — those studying in career areas that are not traditional for their gender.

- Secondary school CTE course enrollments constitute a large and significant segment of overall public secondary school enrollments in California, accounting for 633,972² enrollments, or 32.1%, of the state's 1,974,601 million enrollments in 9th to 12th grade in 2005-06.³ Secondary CTE serves students throughout the state primarily through comprehensive and alternative high schools and county offices of education. CTE programs statewide are clustered into 15 "industry sectors," each of which encompasses three to seven more focused "pathways," as codified in the recently approved "California CTE Model Curriculum Standards." Given historical organizational structures, the 15 industry sectors are further aligned with six broad career areas to facilitate professional development, information dissemination, and other activities. These include:

- 1) Agriculture education
- 2) Business and marketing education
- 3) Health careers and human services
- 4) Home economics
- 5) Industrial and technology education
- 6) Arts, media, and entertainment

In addition to the CTE courses that are offered within high schools as stand-alone courses or sequenced pathways, secondary CTE is also offered through integrated academic and CTE programs, including career academies funded through the California Partnership Academies program and Specialized Secondary Programs.

Further, Regional Occupational Centers and Programs (ROCPs) offer approximately 100 career pathways and programs, as well as career counseling and guidance, career exploration, work-based learning, and placement assistance through 74 ROCPs statewide. Secondary ROCP represented 375,471 enrollments in 2005-06.⁴

- Apprenticeships, funded through both the CDE and the CCC, offer important postsecondary options for many students.
- Adult Education, also offered by both CDE and CCC, serves adults through an open entry/open exit system with programs that prepare students for both entry level and higher levels of employment. Adults are also served through ROCPs. The total numbers of adults enrolled in adult schools and ROCP CTE was 332,072 for the 2005-06 school year.⁵
- Two programs administered through the CCC closely link secondary and postsecondary instruction: Tech Prep and Middle College High Schools.
- Community college CTE programs are central to preparing students for the workplace. In the academic year 2005-06, California's Community Colleges served more than 2.5 million

² California Basic Educational Data System (CBEDS), 2005-06.

³ CBEDS 2005-06

⁴ Carl D. Perkins Data System, data retrieved December 2006.

⁵ Carl D. Perkins Data System, data retrieved December 2006.

students, of which approximately 1.4 million,⁶ or about 56%, are considered to be CTE. The community colleges offer courses in over 130 occupational areas, grouped into six subject areas:

- 1) Agriculture and natural resources
 - 2) Business education
 - 3) Family and consumer science
 - 4) Health careers
 - 5) Industrial and technical education
 - 6) Public safety education
- Finally, the CCC's Economic and Workforce Development Program (EWDP) links CTE subject matter to emerging industries and to its strategic initiatives, including advanced transportation and energy, environmental health safety and homeland security, biotechnologies, multimedia/entertainment, workplace learning resources, business and workforce performance improvement, international trade, small business development, health, and applied competitive technologies/manufacturing.

SUMMARY OF FINDINGS

- *What is the current status of CTE in California and what are the major trends?*

In answer to this question, summarized below are the study's overall findings, based on the review of existing program information and enrollment data, and data collected through surveys and focus groups.

The findings of this study demonstrate that CTE is a complex system designed to meet the career preparation needs of students, the workforce needs of industry, and the economic development needs of communities. It provides a wide array of programs at both the K-12 and postsecondary levels, spanning instruction, career guidance and exploration, workplace experience, economic development, and training and retraining of adults at various levels of education and through successive career transitions. Many of these functions are performed within CTE instructional programs themselves, while others are performed through separate programs either on or off school and college campuses, requiring coordination among disparate organizations. Given historical factors and the requirements of varying funding streams, career areas and enrollments are currently clustered somewhat differently across programs and at each level, but efforts are underway to promote greater coherence.

Overall, the system served over 2.7 million students during the 2005-06 school year. Despite large enrollments, data collected showed declining enrollments in secondary school CTE programs since 1993, paralleled by declining numbers of classes. The data, in and of themselves, do not explain why this is occurring. However, they do suggest that students may not be receiving the CTE services that would promote the development of skills needed for employment and meaningful exposure to the full range of postsecondary educational and career options. While no assessment of the quality or rigor of these programs has been made, the literature

⁶ 2004-05 data, the latest available

suggests that, without the availability of CTE programs, students may lack access to the very strategies that could also keep them engaged in school and promote their academic success.

Decreasing secondary enrollments notwithstanding, surveys and focus groups revealed that students who are enrolled highly value their CTE programs, given the opportunity to learn through “hands on” experiences in areas of career interest and in supportive environments. Employers, for their part, depend on the CTE system to provide students basic workplace competencies in addition to technical skills; some employers rate workplace competencies as more important than technical skills. Focus groups revealed that employers also presume basic academic skills and value the capacity to continue learning.

Educators value CTE for the relevance it brings to student learning and the engagement they have seen in their students. Across both CTE and academic/non-CTE programs, instructors are implementing a variety of strategies to make learning more relevant to students’ career interests and to workplace needs. Many CTE and academic/non-CTE instructors integrate their curricula. CTE instructors report in high numbers that they integrate academic content and standards; academic instructors report that they incorporate projects and some career context and exposure into their courses. CTE instructors are also beginning to implement the newly adopted California CTE Model Curriculum Standards that incorporate both academic content as well as workplace competencies. However, many instructors reported a need for additional time to collaborate with their colleagues to integrate curricula more fully. “Learning communities” at both secondary and postsecondary levels appear to facilitate closer collaboration, while creating more personalized environments for students.

In addition, a substantial majority of administrators and CTE instructors reported that their CTE courses incorporated a formal work-based learning component. The survey data revealed that the most prevalent work-based learning model was “in-class, school-wide, or community-based projects,” followed by internships, unpaid work experience, and paid work experience. Not surprisingly, internships are more prevalent in postsecondary than in secondary school settings. However, barriers to implementation include: the time and resources required to secure, coordinate, and monitor placements; time for students to participate; transportation issues; and some students’ need for paid (versus unpaid) opportunities. These barriers pose challenges to widespread implementation of more intensive work-based learning opportunities.

The counselors who participated in surveys and focus groups were supportive of CTE, but some secondary counselors expressed a reluctance to refer students to CTE classes if this would compromise students’ completion of A-G requirements for UC/CSU admission. Lack of time in students’ schedules also limits CTE enrollment for students who must take remediation classes as a result of standardized testing and the California High School Exit Examination.

Survey responses revealed that career guidance typically begins in high school, but several focus groups stressed the importance of beginning in the middle school grades. Results indicate that counselors most often provide career guidance services to students-at-large in their schools or colleges, and less frequently in ways that are connected to specific CTE courses or special programs. The forms of career exploration and planning that are available to students vary widely and include the use of written or multimedia tools that describe careers; career assessment

or reflective exercises; and consultation with a counselor or staff member. Job shadowing and the development of formal career plans are less prevalent. Survey responses also showed that students were exposed to information concerning nontraditional careers “to some extent,” though not extensively. Only about half of students have the opportunity to explore career options before selecting a CTE program; 29% of counselors/guidance staff reported that students only had this opportunity to a “minimal extent.” Students reported that career guidance is most frequently offered by CTE instructors themselves, though they expressed interest in having more access to counselors and career staff.

Both educators and students reported on the importance of the individual attention and support offered by CTE programs, including Career Technical Student Organizations (CTSOs). This is particularly the case for students in “special populations” designations, who make up a large percentage of CTE students. While many educators reported that they are responding to the needs of students in “special populations” groups, they also cited numerous challenges, including lack of time and resources to offer CTE materials in other languages; ensure timely outreach and enrollment; and provide the necessary support services, remediation, and differentiated instruction. Data collection on outcomes for special populations poses another challenge to program improvement efforts.

Close partnerships with employers were emphasized as essential to ensuring CTE’s relevance to the workplace and responsiveness to the needs of industry. Partnerships were reported to be strong, with employers participating actively on Advisory Boards. However nearly a third of employers reported that they could do more and another 10% would contribute but had not been asked. Again, time — in this case, to build partnerships with employers — was reported as a pervasive challenge for instructors. Respondents suggested the use of intermediaries as a means to facilitate transactions, whether dissemination of labor market information or brokering of work-based learning opportunities for students, as long as educators still had opportunities to interact directly with employers.

With regard to the system as a whole, coherence has yet to be achieved. While approximately 75% of educators reported that there were CTE course sequences and pathways available to students, challenges with master scheduling, lack of time for staff to plan and coordinate, and low CTE enrollments compromise the creation and viability of full sequences and pathways. Further, while a substantial majority of both administrators and CTE instructors indicated that their institutions’ courses were aligned/articulated with feeder schools or post-secondary institutions, focus groups revealed numerous challenges to articulation, including the time necessary to create agreements and lack of student participation, among others. Finally, when educators were asked about their coordination with local Workforce Investment Boards, Youth Councils, and One Stop Career Centers, results showed that coordination with these workforce initiatives is moderate at best. When programs do coordinate with workforce development efforts, participation on the Workforce Investment Board was the primary strategy reported.

In discussing the system as a whole, respondents urged a shift to a more “demand-driven system,” one that focuses on skill mastery rather than “seat time.” Further, respondents called for more flexibility in the CTE delivery system in response to both the ever-changing needs of industry and the needs of many students to juggle education with other commitments.

Another area that calls for flexibility is teacher recruitment. The study revealed that substantial challenges exist in recruiting skilled teachers who also have industry knowledge and technological expertise. The major barriers to recruiting and retaining staff are low pay compared to the private sector; an inadequate supply of qualified teachers; an inadequate supply of credentialing programs, exacerbated by the 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 the pressures on staff due to a continual need to re-train to keep pace with trends in industry. When asked to document the challenges they had experienced in retaining instructors, “teacher burn-out” (due to low pay and stressful working conditions) was the common response. Other concerns related to retention include inadequate professional development opportunities, especially for new teachers, and enrollment-related concerns, including program terminations due to low levels of course and program enrollment.

The most common form of professional development currently offered is participation in industry conferences. However, externship and job shadowing opportunities for instructors and counselors, though less widely offered, are considered key to ensuring that instructors and counselors are aware of the needs of industry — and thus key to bringing relevance into classrooms.

Finally, collaboration among faculty was seen as important to many focus group participants. Beyond its role in facilitating curriculum integration, professional development, and student support, collaborative work was described as a means for communicating the value of CTE to a wider audience; better communication enables academic faculty and others outside the CTE community to gain greater understanding and respect for the benefits of CTE.

In sum, despite the challenges, efforts are underway to strengthen CTE programs, integrate programs, and create seamless pathways from secondary to postsecondary education and into the workplace, to better serve the workforce and economic development needs of communities and to promote individuals’ economic security and career fulfillment.

RECOMMENDATIONS FOR SYSTEM DEVELOPMENT

- *What resources and system improvements are essential at the state and local levels to ensure that CTE meets the current and evolving needs of students, communities, and the economy?*

In answer to this question, offered below are recommendations clustered into four themes that recurred throughout both the literature review and the surveys and focus groups. While clustered, many of the recommendations are interrelated, reflecting the systemic nature of CTE and highlighting the pervasiveness of some of the key issues that impact CTE implementation.

1) Create stronger ties between CTE and “academic” instruction and with counseling and guidance functions; create opportunities for ongoing collaboration and learning among all staff.

The literature reviewed for this study discusses industry’s need for employees who not only have basic academic skills and workplace habits, but who are critical thinkers and problem solvers, who adapt readily to change, and who know “how to learn.” This requires an education system that can foster these qualities — one that promotes “rigor, relevance and relationships.” This also requires an environment where educators themselves have the opportunity to work together and grow professionally.

a) Promote complementarity between CTE and academic/non-CTE programs, ensuring that CTE courses foster the achievement of academic standards and meet high industry standards, while leveraging the strength of CTE: hands-on, career-focused learning.

CTE can benefit more students. Respondents expressed the view that CTE should prepare students for both postsecondary education and careers and decried what they saw as a two-tiered system: one for the “college bound” and one for those going “straight to work.” In the current scenario, “college bound” students sometimes miss opportunities to take CTE courses that could be of great interest and benefit.

Both the literature and the data collection suggested that integration of CTE and “academic” curricula can help shift the “either/or” paradigm. Integrated curricula and project-based, career-focused opportunities are reported to enhance students’ motivation and engagement with school. This was supported by the substantial majority of educators and administrators who stated that integrated curricula provide opportunities for students to learn in multiple ways, enabling students to gain a more concrete mastery of academic concepts. The challenge is to promote high quality programs — both “academic” and career technical — in ways that leverage the strengths of each. Through complementary strategies and the leveraging of resources, CTE and “academic” curricula can reinforce one another to provide both academic skills and the relevance that promotes learning.

The National Assessment of Vocational Education (NAVE) reported that lack of clarity in the definition of “integration” had hampered implementation. Therefore effective implementation requires a definition of “integration” that encompasses various strategies, yet one that also describes specific alternatives to address different goals. Strategies may include the infusion of academic skills into CTE programs, adding career context to “academic” classes, or both, as is often done in career academies or career-themed learning communities. Strategies may also include expanding opportunities for experiential and work-based learning, and for meaningful career exploration. No matter how a school, college, or program chooses to proceed, opportunities for coordination, development of complementary curricula, and even team teaching should be considered so that, in the aggregate, across the curriculum, students have the opportunity to be challenged, solve problems, exercise their academic and technical skills, and explore career options in multiple ways. The goal of meeting workforce needs must also be addressed, particularly at the postsecondary level. Irrespective of the integration strategies employed, both the current study and the literature suggest that collaboration among faculty is paramount.

Resources required to promote integration include:

- Time for CTE and academic/non-CTE instructors to collaborate in curriculum development
- Professional development for secondary CTE instructors on integration of the content standards as well as the California CTE Model Curriculum Standards
- Professional development for “academic only/non-CTE instructors” on CTE and the needs of the workplace
- Externships or faculty job shadowing in industry — preferably in teams — to allow for observation of the skills required in the workplace and exploration of learning opportunities for students, with follow up time for joint curriculum development

b) Offer an array of career guidance and exploration activities, beginning in middle school; allow students sufficient time with counseling or other guidance staff; provide professional development to counseling staff on the needs of the workplace — through externships in industry or other direct industry contact.

Bringing career awareness activities into lower grade levels will expose students to a wide variety of career possibilities and help them form clearer expectations about the academic preparation required for various options. Further, ensuring that students have the opportunity to speak with either counselors or guidance staff *before* they select CTE courses and pathways can facilitate appropriate decisions. The literature as well as survey and focus group respondents suggested that the career guidance function can be performed by a variety of individuals: counseling and guidance staff, instructors, or community-based mentors. In distributing this function, the provision of professional development for staff on the National Model for School Counseling Programs would help to ensure high quality guidance.

Given the well-documented need for students to develop self-knowledge and career management skills, the identification of transferable skills in CTE coursework and activities, as well as reflection on interests and experiences, will facilitate students’ decision-making about course selections and career options at all levels. Further, counseling and guidance staff reported that CTE offers valuable career exposure for students and expressed interest in learning more about CTE in order to refer students to services more effectively. The study revealed that participation in industry-sponsored externships and job shadowing is one of the most effective strategies for exposing educators to the needs of the workplace. The participation of counselors in these opportunities would also be valuable.

Finally, some counselors expressed conflict between their desire to refer students to CTE courses and the need to help students structure their schedules to enable UC/CSU admission. The fact that many CTE courses are not A-G approved was reported by many to be a barrier to student enrollment in CTE. Increased emphasis on strengthening the academic content of CTE overall, and the sharing of effective processes among practitioners will continue to result in more course approvals. However, short of all CTE courses being A-G approved, further investigation is required to explore options that will enable a wider range of secondary students to benefit from at least some key CTE strategies, such as experiential learning, career exploration, and exposure to the workplace, and still have access to UC/CSU admission. Further, many participants in this

needs assessment asserted that enrollment in the California university system directly after high school is not the only path to success. A “longer view” of success would encompass more diverse postsecondary choices, including, among others, enrollment in community college with transfer to the university, and would shift the focus from “university admission” to “attainment of goals.”

c) Ensure that students receive the support services they need to succeed, especially as CTE courses become more rigorous; develop more systematic approaches to identify needs early.

Support services, including mechanisms to promote early identification of potential problems, can be essential in helping students persist in their course work. Participants in focus groups noted that for students who belong to one or more “special populations”, the availability of support services may spell the difference between persistence and attrition from an educational program. The literature on education reform and the creation of viable career pathways posit that support systems are necessary to ensure student success.

Recommended strategies include tutoring, the creation of “vocational ESL” programs, and workplace preparation activities and work-based learning to build confidence. Many students in special populations also require logistical support.

d) Foster greater collaboration for curriculum integration and joint professional development of CTE and non-CTE instructors, to promote mutual understanding and learning.

The importance of faculty and staff collaboration emerged so pervasively throughout the literature and data collection that it warrants a separate recommendation. Collaboration is vital for ensuring ongoing professional development and appropriate student services. Participants also saw collaboration on curriculum and instructional methods as essential. In addition, one specific form of faculty collaboration — the mentoring of new teachers by more experienced faculty — was seen as a particularly effective means of conveying practical information, support, and encouragement to new teachers. Participants also spoke highly of learning communities and the collaborative opportunities that those designs could provide.

Because of the reported gulf between CTE and non-CTE instructors, many participants also recommended closer working relationships to promote mutual understanding and reinforce the strengths that each brings to student learning. CTE instructors want support in integrating academic content into their courses, while non-CTE instructors want a better understanding of careers and how career themes can provide context to their instruction. At the same time, instructors reported that lack of time is a significant barrier to collaboration. While the pool of non-CTE instructor respondents to the survey probably represents those who are more favorably inclined to CTE than perhaps other non-CTE instructors, the responses suggest that funds targeted to collaborative activities would both serve expressed needs and demonstrate the value of collaboration to other faculty.

e) Promote learning communities when possible, both to enhance personalization and the foster collaboration among faculty; promote student organizations that can offer needed personalization and workplace experiences, especially in the absence of learning communities.

In the literature as well as in the surveys and focus groups, learning communities are cited as an important vehicle for promoting faculty collaboration to develop integrated programs. In addition, learning communities create environments where students are seen and known as individuals.

CTE Student Organizations (CTSOs) were also reported to offer personalization and individualized attention. Further, they were reported to foster student engagement, promote critical thinking and communication skills, prompt leadership development, raise career aspirations, and increase self-confidence. CTSO competitions were cited as especially valuable, drawing upon the contributions of both faculty and members of the business community in assessing student performance, in a supportive environment. These competitions couple high expectations with meaningful activity and caring relationships, thus facilitating risk-taking and growth.

2) Ensure ongoing meaningful input from industry on skills needed in the workplace, standards, and curriculum, as well as direct mentoring of students and educators.

Employer engagement is fundamental to the quality of CTE programs. The recommendations below focus on effectively engaging employers to provide both advisory services and to work directly with faculty and students.

a) Invest in the strengthening and maintenance of relationships with employers; consider the use of liaisons or intermediaries to provide a “single point of contact” for employers and to facilitate transactions.

Across the board, the results of the study underscore the vital role that members of the business community play in the content and implementation of CTE programs. Although industry partners may take a leading role in sponsoring internships and job-shadowing opportunities and in securing employment placements for CTE students, they may also be instrumental in a host of other roles. These roles include: curriculum development, program design, the development and application of standards, technical and financial support for student leadership, and scholarship programs. Although substantial investments of time (bilaterally) are required to cultivate high-quality linkages with industry partners, the products of these linkages are vital to ensuring that programs stay current with economic trends and that program graduates remain competitive with the demands of the labor market.

Focus group participants indicated that formal as well as informal linkages with industry representatives were important to ensuring the adequate flow of information and collaboration between educators and business partners. They also proposed the idea of designating an intermediary party (individual or organization) to build and maintain relationships with employers. The literature reviewed indicated that the use of intermediaries has been a successful

strategy in some youth and adult workforce development programs throughout the country for brokering information and opportunities between employers and service providers. Strategies should be explored to more effectively use intermediaries, such as economic development agencies, in ways that promote efficiencies for both educators and employers, while still allowing for the personal contact that educators value.

b) Create alliances with industry for recruitment and professional development of faculty and for placement of students in work-based learning opportunities and jobs.

In order to address ongoing challenges with the recruitment of teachers who are both skilled in teaching and skilled in a given career technical area, more flexible means of recruiting staff from industry are needed. Alternative credentialing of professionals from industry, “guest teacher” programs, and other means to bring industry representatives into classrooms and training programs merit exploration.

Further, focus group comments and survey results indicated that instructors would prefer more frequent opportunities to gain first-hand experience in their area of career focus; there appears to be a much higher demand for job-shadowing and externship placements than there are opportunities available. To the extent that schools and colleges can forge alliances with employers in key industries of interest, as many already do, placement of instructors in workplaces and other exchanges will be greatly facilitated.

Finally, employers in the industry survey reported that for entry-level employment, “a high school diploma” and “experience in the workplace” were the most important requirements. For many students, these experiences must be paid jobs. A concern that arose frequently in survey comments and focus groups was that many students face economic conditions that require them to work while studying. This prevents some students from participating in unpaid internships. In some community college programs, students are required to find a job in the career area of study, and longstanding relationships with local employers in the industry make this possible. Such relationships with industry should be cultivated whenever possible. When this is not possible, efforts should be made to help ensure that when students are in the workplace, experiences are rich and meaningful. Many examples are available and should be explored to ensure that students have work experiences that are linked to their coursework and contribute to further career development.

3) Promote stronger linkages among public institutions to ensure system coherence and flexibility.

The literature reviewed emphasized the importance of creating “seamless” career pathways to promote both individual student success and to ensure that CTE is aligned with the economic development needs of the state. These “pathways” are defined differently throughout the literature — some definitions focus on secondary programs that offer close-knit career-focused learning environments for students, and some focus on statewide systems for organizing curricula and coordinating education, workforce preparation and economic development initiatives. Different emphases notwithstanding, all of these argue for innovative approaches to promote coherence and flexibility.

Surveys and focus groups corroborated these arguments. Participants provided recommendations for each component of a “coherent system.” They also provided overarching recommendations across system components that called for another shift, from a supply-driven system to a demand-driven system — one that can respond flexibly both to the needs of the workplace and to the needs of students over multiple career transitions.

a) Address barriers to course enrollment to provide greater student access to CTE; create complete course sequences and pathways to ensure successive skill building and career exploration within a given area.

Focus groups and surveys suggested that the primary barriers to the implementation of complete course sequences and pathways at the secondary level were not curricular, but rather low enrollment of students and challenges with master scheduling. Respondents provided several interrelated reasons to explain low enrollment figures, some of which have already been mentioned:

- University admission criteria that favor A-G courses, coupled with the challenges in obtaining A-G approval for CTE courses
- Testing and school accountability requirements that result in student placement in remediation courses, eliminating room in students’ schedules for CTE courses
- The perception that CTE courses are not appropriate for “college bound” students, whether or not they are in fact rigorous
- Poor visibility of CTE courses resulting in lower referrals
- Lack of educators’ awareness of the needs of the workplace, resulting in a low priority placed on career exploration
- Inadequate or non-systematic recruitment of students into CTE programs, including both “special populations,” who may face language and other barriers to enrollment, and students at large

Respondents recommended a variety of strategies to increase enrollment, including creating greater visibility for the programs and more systematic outreach to students. In addition, as further discussed below, closer collaboration between secondary and postsecondary programs would facilitate dual enrollment, enabling students to access successive class levels across institutions.

b) Investigate articulation issues more fully and explore alternatives to course-to-course articulation as appropriate; expand dual enrollment and “Middle College High School” programs.

The creation of a fully functional articulated CTE system requires the balancing of state and local priorities, while serving the needs of students as well as meeting workforce demands of current and emerging industries. According to the SB 70 Implementation Plan, “California’s CTE system has several weak — or missing — links”; current curriculum alignment and program articulation is characterized as “spotty and provincial.” Survey data and focus groups revealed a number of challenges to articulation, including misalignment of feeder courses, “turf” issues, and lack of time to develop articulation agreements. The NAVE report cited several

factors that have limited the impact of articulation, including a focus on course-to-course instead of program-to-program articulation, and few students availing themselves of opportunities for articulated college credit. As was the case in this needs assessment, the report suggested that some students construct their own career paths instead of conforming to the course sequences offered by their local CTE systems. Our students may be more visionary and flexible than our systems.

The NAVE report recommended both expanded articulation and dual enrollment opportunities for high school students. In addition, the California Community Colleges have implemented a "Middle College High School" option, similar to the Early College High School concept supported by the Bill and Melinda Gates Foundation. These schools offer high school students an opportunity to more easily access community college curricula by locating the high schools on college campuses. This also allows for the leveraging of CTE resources, including use of laboratories and equipment. Further integration and expansion of the "Middle College High School" and other dual or concurrent enrollment strategies should be investigated.

c) Promote system flexibility, to both address the changing needs of the workplace and to address the needs of students with multiple demands in their lives.

Participants from a variety of different focus groups concurred that flexibility in program design and in curriculum approach were central to helping CTE programs keep pace with the evolving needs of industry. Program design flexibility — in particular, the availability of multiple entry and exit points — was also deemed crucial to facilitating the participation of special populations in CTE programs, given students' competing family and employment obligations. As suggested by respondents, technology-assisted learning, including distance learning and web-based curricula, also provide students greater flexibility.

Flexibility for students requires a shift in perspective from "seat time" to *skill mastery*. Focus group participants proposed the creation of flexible courses, structured in ways similar to supervised independent study, driven by students' achievement of industry standards. In such a system, curriculum would be developed using performance-based instructional design approaches. A number of challenges to making this shift were reported. This issue requires further attention if CTE is to become a truly "demand-driven" system.

d) Further strengthen alignment between education, workforce preparation and economic development.

The community colleges have forged strong linkages between economic development efforts and CTE. These must be ensured to strengthen programs, connect them with the changing needs of the workplace, and provide the quality career pathways that can maintain a skilled workforce and support emerging industries.

While the community colleges have created organizational strategies to align economic development with CTE, CTE at the secondary level is not fully integrated into these strategies. As mentioned, implementation of linkages between secondary and postsecondary programs,

including career pathways, as called for in SB 70, will promote this kind of integration. Visibility for these efforts can encourage replication of successful models.

4) Demonstrate how CTE promotes student success; align data collection and reporting systems to track system performance; make the benefits of CTE more visible.

This final set of recommendations focuses on promoting CTE through demonstration of its benefits, particularly with regard to student achievement and success.

a) Demonstrate how CTE promotes student success.

In this era of accountability, and given the new requirements of the Perkins Act, there will be increasing attention placed on CTE's role in improving student achievement and other outcomes. A pervasive theme echoed by administrators, instructors, and counselors at the secondary level is that the focus on high-stakes testing and accountability in California schools has detracted from support for CTE at the secondary level. In community colleges, focus on transfer to four-year universities can also detract from CTE. As reported in surveys, many administrators and staff want evidence that CTE can support student achievement and promote other positive outcomes. This calls for a well-articulated vision of CTE and its significance to both immediate and long-term student success that is persuasive to administrators, faculty, and staff.

With the adoption of the California CTE Model Curriculum Standards that are linked to the academic content standards as well as workplace competencies, California is poised to develop assessments that measure student progress against standards that promote student achievement in alignment with CTE curricula. Similarly, at the postsecondary level, industry standards drive performance measures and certification processes to ensure skill mastery. In addition, respondents in this needs assessment, corroborating the literature, reported that CTE promotes other positive outcomes, including higher levels of engagement, as measured by better attendance, persistence in school, and other means, as well as by many career- and employment-related outcomes. Demonstrating performance in these areas can also enhance the view of CTE as contributing to student success.

Employers can also contribute to the assessment process directly, as they do in many community college and ROCP programs, as well as in many high school project-based and work-based learning programs. In doing so, they provide feedback to educators on the success of students in the workplace and expand the focus of assessment to include authentic measures of performance. Not only can these assessments provide a more complete view of student learning, but employer involvement in the assessment process can contribute significantly to discussions related to multi-faceted assessment systems.

b) Align data collection and reporting systems between K-12 and community colleges.

There is an added need for improved data collection and dissemination in general. Quantitative data about the effectiveness and success of particular features of CTE can be instrumental in helping educators shape program characteristics to enhance achievement and reduce attrition. Further, the literature described seamless career pathways spanning both K-12 and postsecondary

segments, but currently, data collection and reporting systems do not reflect the needs of a coherent K-14 system; each educational segment currently uses separate data management systems and categorizes CTE programs in different ways. Alignment of data collection systems can facilitate planning and system-wide reporting.

c) Make CTE and its benefits more visible to students, to parents, to other educators, including non-CTE faculty and counselors, and to the community at large.

Across the board, participants from each of the stakeholder groups included in this study emphasized the need for better communication about the availability, features, and benefits of CTE. Enhancing CTE visibility is highlighted here as a separate recommendation due to the pervasiveness of this issue. Survey and focus group responses underscored the importance of enhanced communication among educators and between educators and other stakeholder groups, such as parents, industry representatives, members of the community, and legislators. Lack of awareness was cited as one factor underlying low enrollment in some CTE programs, which in turn disrupts course sequences and pathways; this lack of awareness may also lead to low rates of participation in support services that help students persist in their academic studies. Finally, the importance of more effectively communicating the benefits of CTE was strongly emphasized by students, who, above all, wanted their peers to know about the availability of these opportunities.

CONCLUSION

Career technical education in California incorporates many components of a coherent CTE system, spanning from early career exposure and experiential learning opportunities to focused career preparation for adults in transition. Recently enacted state legislation has strengthened the role of CTE in the public education system. The Governor's 2006-07 budget called for expanded career technical education opportunities and improved linkages between public schools and community colleges. Efforts are underway to link the state's investment in economic development with its investments in public education and other programs. Carl D. Perkins Career and Technical Education Improvement Act funds will further strengthen the implementation of key strategies. While surfacing challenges to be addressed, this study suggests strong support from educators, industry, students, and parents for these and other efforts to create a world-class CTE system — one that promotes student engagement, success, and lifelong learning and that affords all individuals the opportunity to achieve productive and rewarding careers, contribute to the state's diverse and evolving economy, and enhance and sustain the quality of life in their communities.