Chapter 2

WHAT ARE MULTIPLE PATHWAYS?

The expansion of multiple pathways has the potential to make high school a more cohesive experience for students by providing them with integrated academic and career learning opportunities. It also has the potential to expand students' options and opportunities. In a multiple pathways approach, districts make several different pathways available to students throughout their jurisdictions, with each pathway usually — though not necessarily — aligned with one or more industry sectors. The aim is that students have access to at least one pathway matching their interests.

The term "pathway" is a common term in education. Within the multiple pathways context, a pathway is defined as:

> A multiyear, comprehensive high school program of integrated academic and technical study that is organized around a broad theme, interest area, or industry sector.[1]

Each school district has broad latitude to define its theme-based pathways within or across several industry sectors.[2] In most cases, pathway themes are associated with industries that are prevalent in that region.

Given the earning limitations of careers available to those without some education or training beyond high school, it is important that multiple pathways programs be designed to ensure that all high school students have curriculum choices that will prepare them with the knowledge and skills necessary for:

- Successful career entry immediately after high school

  — ***and*** —

- Successful participation and completion of education after high school, including, for example, two- and four-year colleges and universities, apprentice programs, formal employment training, and other postsecondary options

Core Components of Each Pathway

To reach the twin aims identified above, each pathway requires, at a minimum, the following four core components:

[1] This definition is from AB 2648, which further identifies the industry sectors as those including, but not limited to, "the industry sectors identified in the model standards adopted by the state board pursuant to Section 51226."
[2] That is, the term "pathway" in this context is not synonymous with the 58 pathways identified as specific occupational areas within each of the 15 industry clusters identified in *Education Code* Section 51226.

1. **An integrated core curriculum** that:
   - Provides access to a challenging academic component that prepares students for success in California's colleges and universities, including apprenticeships and other postsecondary programs
   - Is delivered through problem- and project-based learning and other engaging instructional strategies
   - Intentionally brings real-world context and relevance to instruction, using methodologies that emphasize broad themes, interest areas, and career and technical education

2. **An integrated technical core curriculum**, including a sequence of at least four related courses, that:
   - Contains CTE standards-based courses
   - Provides students with career management skills
   - Is aligned with and underscores core academic principles and standards

3. **A series of work-based learning opportunities** that begin with mentoring and job shadowing and evolve into intensive internships, school-based enterprises, or electronically assisted mentorships.[3]

4. **Student support services**, including supplemental instruction in reading and mathematics, to help students master the advanced academic and technical content necessary for success in postsecondary education and careers.[4]

Essential Characteristics of High-Quality Multiple Pathways Programs

The following characteristics appear to be essential for the development of effective multiple pathways programs.[5]

Equity and access. Pathways are selected and designed broadly to address the needs of students with diverse abilities and interests. The pathways are accessible to all interested students and recruit students of both genders and from diverse ethnic backgrounds. The pathways explicitly facilitate access to and success in multiple postsecondary options for all participating students, for example, by providing rigorous courses of instruction in all subject areas (Bangser, 2008; Dolejs, 2006; Hoachlander & Dayton, 2007; Friedlander & Darling-Hammond, 2007; Kemple, 2008; Lee & Smith, 1995; National Research Council and the Institute of Medicine, 2004).

Informed student choice. Students have choice with regard to their selection of a pathway, their selection of academic and technical courses within the pathway, and the postsecondary options they seek to pursue. Students and their families receive timely information, guidance, and exploration opportunities that enable them to make appropriate choices (Bangser, 2008; Benard, 2004).

[3] For more information see, Chapter 6.
[4] For more information see, Chapter 7.
[5] Many of these characteristics are drawn from literature regarding the of effective educational programs generally, since the literature regarding multiple pathways programs is relatively new and not yet conclusive in some areas.

Student engagement. Instruction and related activities inspire student interest and desire to learn and facilitate that learning through active participation. Students are engaged from the moment they arrive on the high school campus to mitigate early dropping out (Kemple, 2008; Kemple, Herlihy, & Smith, 2005; National Association of Secondary School Principals and the Education Alliance, 2004; National Research Council and the Institute of Medicine, 2004; Page et al., 2002; Walcott, Owens-West, & Makkonen, 2005).

Relevance for students. Students understand the relevance of their learning experiences beyond school — how academic and technical knowledge are applied in industry; they also understand how their learning links to their own future career aspirations. Through exposure and direct experience, students connect their learning to the world beyond the classroom in ways that are personally meaningful (Bangser, 2008; Friedlander & Darling-Hammond, 2007; Kemple, 2008; Kemple with Scott-Clayton, 2004; Kemple, Herlihy, & Smith, 2005; Walcott, Owens-West, & Makkonen, 2005).

Personalization and support. Through the pathway they choose to participate in, students are provided with a smaller school community; are known by their teachers, peers, and other school staff; and develop a sense of community. Students' academic, social, psychological or logistical needs are readily discerned and addressed (Hoachlander & Dayton, 2007; Friedlander & Darling-Hammond, 2007; Kemple, 2008; Kemple, Herlihy, & Smith, 2005; National Association of Secondary School Principals, 2004; National High School Center, 2008; National Research Council and the Institute of Medicine, 2004; Page et al., 2002; Walcott, Owens-West, & Makkonen, 2005).

Depth of learning. Students are provided opportunities to learn in depth in both academic and technical skill areas, as reflected through performance-based assessments and other demonstrations of acquired knowledge. Technical and academic instruction, taken together, are deep enough to both enable future application of knowledge in the workplace and lay a foundation of theoretical understanding needed for further learning and career development (de Cos & Chan, 2009; Friedlander & Darling-Hammond, 2007; Grubb & Oakes, 2007; Rose, 2007).

Breadth and transferability of learning. Multiple pathways programs expose students to options, as well as to prepare them for future learning and careers in a given industry area. The curricula in multiple pathways programs provide students with both broad exposure to the alternative careers in a particular industry sector and a set of basic transferable skills that would be useful to students, regardless of the career they eventually pursue, across industry sectors (de Cos & Chan, 2009; Grubb & Oakes, 2007).

Developmental appropriateness. Students have opportunities to learn in ways that are appropriate to their developmental needs. These opportunities include increasing levels of responsibility and autonomy as students mature, and providing access to caring adults in schools, workplaces, and communities who can join with parents in guiding students into adulthood (Bangser, 2008; Benard, 2004; National Research Council and the Institute of Medicine, 2004).

High-quality curricula. Curricula in all subjects are standards-based and, in both integrated academics and integrated technical core courses, are also validated by industry (Kemple, Herlihy, & Smith, 2005; National High School Center, 2008; Walcott, Owens-West, & Makkonen, 2005).

High-quality teaching. Teachers with expertise in their respective fields provide both academic and technical instruction. Teaching encompasses a broad variety of strategies, including coaching and facilitation of project-based and work-based learning, in addition to instruction. Teachers identify and provide access to learning opportunities outside the classroom to expand and strengthen classroom learning (Dolejs, 2006; Kemple, Herlihy, & Smith, 2005; National Association of Secondary School Principals and the Education Alliance, 2004; National High School Center, 2008; Rose, 2007).

Linkages to middle school and to opportunities beyond high school. Pathways are linked to experiences before high school, so that students come to high school prepared to succeed in pathway programs. Pathways are also linked to a variety of postsecondary options, so that students can envision and gain access to appropriate opportunities after high school graduation. In addition, beyond curricular and programmatic linkages, pathways provide direct support to help students transition successfully from one level to the next (Bangser, 2008; Herlihy, 2007; Kemple, 2008; National High School Center, 2008).

Industry and community partnerships. Programs have direct input from industry and communities to inform the design and delivery of curricula and students' learning experiences (Kemple, Herlihy, & Smith, 2005; Kemple, 2008; de Cos & Chan, 2009; National Association of Secondary School Principals and the Education Alliance, 2004).

Adults as learners. The adults who participate in multiple pathways programs create, along with their students, a shared learning community. Teachers, administrators, and other staff engage in ongoing self-reflection and professional development, thus modeling "lifelong learning" (Bangser, 2008; Dolejs, 2006; Friedlander & Darling-Hammond, 2007; Page et al., 2002; Quint et al., 2005; National Association of Secondary School Principals and the Education Alliance, 2004; National High School Center, 2008; Walcott, Owens-West, & Makkonen, 2005).

Wide Latitude for Schools and Districts

The four core components described above, together with the essential characteristics of high-quality programs, allow for a wide variety of multiple pathways programs. As a result, districts and schools have substantial latitude in developing multiple pathways programs. For example, there is variability across the following design options.

School structures. Students may have access to pathways through comprehensive high schools, regional occupational programs or centers, charter schools, or independent study programs. Districts will need to work with schools to identify specific pathways to be implemented, while coordinating across schools so as to increase choice across the district. Small schools or semi-autonomous schools that share facilities on a large campus might offer a single pathway at each site, thus offering multiple options across the campus. In some cases, whole schools can focus on

single themes; these single-pathway schools offer one option among many within a given district. Regional occupational centers can also serve as pathway sites, but must work in coordination with local high schools to ensure that pathways include all four components. In addition, pathways can be offered via individualized programs where each student pursues his or her personal goals.

Local District 4
Los Angeles Unified School District

Local District 4 of the Los Angeles Unified School District provides an example of a districtwide implementation of a multiple pathways approach. The district is now in the third year of implementing a process in which eighth grade students have a choice of among 19 theme-based small learning environments as entering freshmen. Currently, these environments include several in Belmont High School that offer important components of a multiple pathways approach, including the Academy of Medical and Public Service, the High School of the Arts, the Teacher Preparation Academy, and the Multimedia Academy.

By 2016, the district plans to establish an equitable process that will enable middle school students to choose from at least six to eight high-quality industry sector pathways throughout the district. There are plans for at least two theme-based pathways in each high school, at least one of which would be an industry-related theme that integrates academic and technical curricula, provides work-based learning opportunities, and provides student support services.

Themes. Multiple pathways programs have varying themes. Most programs are based on career themes that fall within one or across several of the following 15 industry sectors identified by California:

1. Agriculture and Natural Resources
2. Arts, Media, and Entertainment
3. Building Trades and Construction
4. Education, Child Development, and Family Services
5. Energy and Utilities
6. Engineering and Design
7. Fashion and Interior Design
8. Finance and Business
9. Health Science and Medical Technology
10. Hospitality, Tourism, and Recreation
11. Information Technology
12. Manufacturing and Product Development
13. Marketing, Sales, and Service
14. Public Services
15. Transportation

While many themes of existing and planned multiple pathway programs fit neatly into one of these 15 industry sectors, some multiple pathway program themes may cross multiple industry sectors. For example, an international trade academy may include curriculum related to several

industry sectors (such as Agriculture and Natural Resources, Manufacturing and Product Development, and Finance and Business), while also highlighting cross-cultural issues and foreign languages. Another example might be a visual and performance arts academy in which all students are expected to complete courses in stage design and construction that involve concepts drawn from the Building Trades and Construction industry sector. In many of these cases, the "technical core" courses may include CTE courses in the more than one industry sector.

Districts and schools typically select pathway themes based on industries in their area, and the pathways, in turn, can be important in developing a qualified local workforce. Most magnet programs and Specialized Secondary Programs[6] are organized thematically, and many adhere to the quality characteristics elaborated earlier. These programs can provide the basis for a multiple pathways approach, if they provide the four core components of multiple pathways programs.

In some high schools, career themes are individualized. In these programs, all students participate in all of the four pathway components, but each student selects his or her own career focus.

High Tech High
San Diego, California

High Tech High (HTH) is a charter school that features all four key components of a multiple pathways approach. A coalition of San Diego business leaders and educators launched the school in 2000 as a single charter high school, and it has evolved into a school development organization with a growing portfolio of innovative charter schools spanning grades K-12.

High Tech High's three design principles — common intellectual mission, adult world connection, and personalization — align well with multiple pathways approach. High Tech High makes no distinction between "college prep" and "technical" education. Enrollment is non-selective, and there is no tracking. The curriculum is rigorous, providing the foundation for entry and success at the University of California and elsewhere. However, assessment is performance-based: all students develop projects, solve problems, and present findings to a community panel. All students are required to complete an academic internship, a substantial senior project, and a personal digital portfolio. Teacher teams have ample planning time to devise integrated projects with common assessment rubric.

HTH students experience some of their best learning outside the school walls through work-based learning opportunities. Juniors complete a semester-long academic internship in a local business or agency. Seniors develop substantial projects that enable them to learn while working on problems of interest and concern in the community. Finally, students at HTH receive personalized student support; each student has a staff advisor, who monitors the student's personal and academic development and serves as the point of contact for the family.

[6] Specialized Secondary 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.

Number of years in the pathway. Multiple pathways programs ideally span all four years of the traditional ninth through twelfth grade high school to ensure early engagement of students. Variation is possible, however, if schools can provide all four components over a different time period and, at the same time, create other means to engage students when they enter ninth grade.

Number of pathways available in a school. There is no optimum number of pathways at a school. Districts and schools should consider the number and sequence of courses the school can realistically provide to deliver high-quality academic courses, career and technical courses, work-based learning opportunities, and support components. Pertinent issues include the number of students; the number of available teachers, counselors, and other staff; access to facilities; the design of the master schedule; and the level of industry, teacher, and community support.

Number of pathways available in a district. The multiple pathways approach does not prescribe a specific number of pathways per district. The intent is that, eventually, all students would have access to at least one pathway of interest, whether at his or her school or within an appropriate travel distance. In rural areas particularly, some courses or experiences might need to be accessed virtually, through distance learning if necessary.

Degree of integration among components in each program. While all multiple pathways programs must include all four core components, pathways will vary in how tightly the academic and technical curricula are integrated. When technical courses have been approved as meeting requirements for university admission, a single technical core class can be thought of as being inherently integrated — encompassing both technical and academic components. This integration applies to over 7,000 CTE courses, though these are mostly in the visual and performing arts and in agriculture. While this number has been growing steadily, it currently represents only about 25.3 percent of all CTE courses. It is important to note that many CTE courses, given the technical focus of their content and instruction, are not appropriate for meeting requirements for university admission; a more theoretical approach could even defeat the purpose of these courses and compromise their value to students. In these cases, coordination with academic courses becomes necessary.

Thus, beyond the "inherent integration" of a-g approved CTE courses or infusion of work-based learning into academic and technical courses, several levels of coordination are possible. In one option, academic and technical coursework is fully integrated so that students do not perceive a difference between the two disciplines, often taught within a single block of time. In other cases, the courses are separate, but applied career-focused learning is infused into the academic courses, and academics are intentionally highlighted in the technical courses, so that each reinforces the other. In yet other schools, academic and technical courses are aligned to the pathway theme, but there is minimal intentional linking of curriculum.[7]

[7] For more information, see Chapter 3.

Health Professions High School
Sacramento City Unified School District

Health Professions High School (HPHS) is an "early college" school that draws from the core components of a pathways approach. The school's mission is to provide students with an outstanding education, rich with relevant academic, real-world, and leadership experiences — with a healthcare theme. HPHS opened in 2005 and currently has 400 ninth to eleventh grade students. Last year with a new freshman class, the school reached its capacity of 500 ninth to twelfth grade students and had its first graduating class.

HPHS provides an intensive medical and health professional preparation program within an environment that provide real-world and postsecondary experiences. The HPHS curriculum integrates healthcare themes throughout all classes; the students present their knowledge twice per year at large presentation events. Students study a rigorous, standards-based education that exceeds the University of California (UC) a-g requirement list. By providing a course sequence along an "early college" model, HPHS encourages students to begin collegiate coursework while in high school. In addition to rigorous academics, students participate in Health Occupation Students of America leadership training and activities, as well as extensive workplace learning opportunities with healthcare partners.

Types of work-based learning. Work-based learning is a core component of multiple pathways approaches, but the types of work-based learning offered can vary. Work-based learning need not always occur in a workplace proper. It may occur on the school campus; through school-based enterprises; in the community through service learning or social enterprises; or through technological means, as in "virtual apprenticeships" or electronically supporting mentorships. The key is providing students access to opportunities that are judged by professional standards, through direct employer or community input.[8]

Classroom staffing. Staffing of academic and technical courses depends on the pathway and includes teachers with varied backgrounds. Teachers in core academic courses provide a rigorous academic program and are credentialed to teach assigned courses. Some exposure to the industry in which the pathway focuses as well as close collaboration with their CTE colleagues enhance their ability to bring relevance to the classroom. Technical teachers, with their required industry experience, deliver rigorous career-specific skills and exposure to the industry sector and are credentialed to do so. In addition, their understanding of the core academic content inherent in their courses enables them to help students make the link between academic and technical content. In some cases, the best teachers for pathway positions will have both university-level academic training and industry experience, and they will hold credentials that enable them to teach both academic and technical classes. In other cases, academic and technical teachers will "team-teach." In yet another scenario, academic and technical teachers will work separately — either integrating their curricula or simply aligning their coursework as described under "levels of integration."

[8] For more information, see Chapter 3.

Manufacturing Production Technology Academy
Laguna Creek High School, Elk Grove Unified School District

The Manufacturing Production Technology Academy at Laguna Creek High School is an example of a California Partnership Academy that exhibits all four of the core components of a developed multiple pathways approach within a school.

The academy, which is organized around manufacturing and engineering, has a teaching team that includes English, math, science, social studies, and CTE teachers. Two instructors have dual credentials, allowing them to teach both academic and CTE courses. Ninth to twelfth grade students enroll in the core academic courses: four years of English, three years of science (including physics), and three years of math. In addition, students have a rigorous sequence of core CTE courses to prepare them for careers or postsecondary work in manufacturing or engineering. The academy has one integrated academic and career technical project each semester that involves industry and postsecondary partners as well as the teaching staff. One partner is the Sacramento Regional High Tech Consortium. In addition, students who complete the four-year course of study can earn nine credits of mechanical engineering credit from Cal State Sacramento.

The lead teacher for this academy sought out both academic and CTE teachers who were interested in working together on a team. The school administration supports the program by ensuring that students are placed in the right courses and accommodated when they need extra support. A support class is provided for ninth and tenth graders with a class size that is lower than the school average. The district also provides an administrator who completes required paperwork and ensures adequate funding and equipment to support the academy.

Staffing for support systems and work-based learning. Counseling and career guidance staff may be centralized or assigned directly to the pathway, depending on the pathway's size, the school's structure of school, available resources, and other factors. In some cases, teachers with adequate professional development can take on these functions. In other cases, community or industry resources may expand staff capacity to provide career guidance and exploration opportunities. Adequacy of personalization, and sufficient breadth and depth of staff knowledge to facilitate student choice and goal setting, are critical factors in designing pathways' counseling and guidance infrastructure. Similarly, work-based learning may be brokered by classroom teachers with industry contacts, or by other staff who can focus on this function. Knowledge of, and credibility with, industry are critical to this effort.

What Do We Know about the Effectiveness of Multiple Pathways?

Based on a review of existing research, the core components of multiple pathways appear to offer promising approaches in helping students prepare for a wide range of postsecondary and career opportunities. From the well-designed studies that have been completed in California and nationwide, multiple pathways have shown positive effects on student achievement, educational attainment, and employment and earnings outcomes. The literature regarding multiple pathways is relatively new and therefore is not yet conclusive in some areas. As a result, this section includes research studies of programs that incorporate some but not necessarily all components of multiple pathways approaches. For more comprehensive reviews of the research literature, see Clark et al., 2007, and Stern & Stearns, 2006.

California Studies

Several studies have focused on the state's California Partnership Academies (CPAs), Regional Occupational Centers and Programs (ROCPs), and the preparation that California students receive to explore career options.

California High School Exit Examination (CAHSEE), graduation rates, and preparation for postsecondary education. CPAs share core strategies with multiple pathways programs and have exhibited higher passing rates on the CAHSEE and on other state exams for Native American, Hispanic/Latino, Pacific Islander and African American students than non-CPA students of the same ethnic background; greater proportions of seniors graduating; and higher rates of a-g course completion (Hoachlander & Dayton, 2007; Stern, Raby, & Dayton, 1992).

High school completion, grade point averages, and standardized test scores. California's ROCPs[9] have demonstrated that previously struggling students from traditional school environments complete high school and achieved higher grade point averages and standardized scores, when taught in career pathways that integrate CTE and academics and that utilize related work-based learning strategies (Adler, 2007; Mitchell, 2007).

Importance of school partnerships important for career preparation. A study of implementation of career exploration programs in California public middle and high schools identified partnerships with community colleges, local business, or industry groups as important for career preparation. Best practices included career days, field trips, advisories, week-long career exploration research projects, partnerships with community colleges, and summer internships with local business partners and community organizations. Major barriers to these partnerships were the lack of staff and limitations on using after-school time due to local collective bargaining agreements (de Cos & Chan, 2009).

Perceived importance of integrated and relevant coursework for postsecondary as well as career preparation. A study of CPAs found that integrated and relevant coursework, support system of caring adults and community, accountable adult leadership, and increased resources and fiscal support were ranked highest as critical components that prepared students academically for four-year colleges. The findings were based on interviews with 55 CPA principals, coordinators, and teachers at 28 academically high-achieving CPAs.

National Studies

National studies addressing multiple pathway components include career academies and programs supported by the National Academies Foundation. In general, a number of rigorous studies find that multiple pathways components, such as integrating academic and career

[9] ROCPs, established in 1967, provide career preparation that includes both the technical skills and related preparation for meeting statewide academic standards, enabling students to be employed in upwardly mobile careers and successfully continue into postsecondary education.

curricula and small learning communities, have a positive impact on labor market outcomes and student achievement.

Employment and earnings gains. Career academies share many core components with multiple pathways programs. As of 2004, about 4,800 high schools nationwide have at least one career academy described as a multi-year program in which the curriculum integrates academic and CTE courses, organized around one or more broad career themes (U.S. Department of Education, 2004). More recent estimates place the number of career academies closer to 6,000. Evaluation reports of nine career academies by MDRC found that the programs generated and sustained significant employment and earning gains, mostly for Hispanic or African American students. These impacts were concentrated among young men who had high likelihoods of dropping out (Kemple, 2008).

Fidelity of implementation. The MDRC reports on career academies also identified the importance of implementing the full career academy model to make gains in academic as well as career attainment. The researchers noted that career academies demonstrate the feasibility of accomplishing the goals of school-to-career and career and technical education without compromising academic goals. With respect to academic achievement, short-term gains were exhibited in engagement and participation but not in long-term educational attainment (Kemple, 2008; Kemple & Scott-Clayton, 2004). The researchers noted that because career academy courses tended to not truly integrate academic and career-related curricula, it is not surprising that no differential effects were observed in students' standardized test scores.

Improved high school graduation rates. Whole school reform models that incorporate some elements of career academies have been found to be associated with high school graduation rates. Specifically, the Talent Development High School model that incorporates elements of multiple pathways is associated with greater promotion rates; increases high school graduates by eight per 100 students; and has a high benefit to cost ratio (Levin & Belfeld, 2007; Kemple, Herlihy, & Smith, 2005). Key components of the model include small learning communities, college preparatory and career-oriented curricula, continuous teacher professional development, and community and family partnerships, as well as learning supports.

Improved academic achievement when academic instruction combined with CTE. Stone and his associates (2005) employed an experimental design to test if mathematics achievement could be improved without compromising technical skill development. Using random assignment, researchers partnered mathematics teachers with CTE teachers or kept mathematics teachers alone (control). Students in classrooms with partnered mathematics and CTE teachers exhibited significantly higher test scores in TerraNova and Accuplacer tests.

Positive effects of small learning environments. An important element of multiple pathways is that they provide a smaller learning environment for students, and a large body of literature addresses the positive effects of small schools or small learning communities (SLCs) (Lee & Smith, 1995; 1997). Smaller schools exhibit lower dropout rates, higher attendance, and higher graduation rates. Smaller learning communities particularly benefit low-socioeconomic-status students and therefore improve equity. The smaller communities also foster greater personalization and belonging as measured by students feeling more satisfied or lower incidences

of vandalism. With respect to implementation, SLCs are facilitated by the inclusion of professional development specifically focused on them, the availability of resources, teacher attitudes and expertise, and prior experience with SLC activities. Factors inhibiting implementation include scheduling or physical space limitations and recruiting and retaining qualified teachers and counselors (Page, et al., 2002).

Future Research

Because multiple pathways are relatively new, particularly at the district level, there is a substantial need for ongoing research about the relationship between multiple pathways programs and student achievement. In particular, California could benefit from knowing more about the relationship between student achievement and:

- Specific design components and program variations of multiple pathways models
- The extent of integration of academic and CTE courses in various fields
- Important student supports for multiple pathways
- Implementation options and strategies at the district and school levels

In addition, questions remain regarding labor market outcomes, phase-in of multiple pathways approaches, effective structures and school size, the role of pre-service preparation in teachers' ability to integrate academic and CTE education, and appropriate time frames for student engagement in multi-year programs. Similarly, qualitative research examining the perceptions of students, parents, teachers, administrators, and industry and community partners would help in designing and improving programs.[10] Given the existing research, however, it appears that multiple pathways offers a promising approach for preparing students more effectively for a wide range of postsecondary and career opportunities.

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[10] Additional recommendations regarding on going research and data gathering are included in Chapter 8: Assessment and Accountability Systems.

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