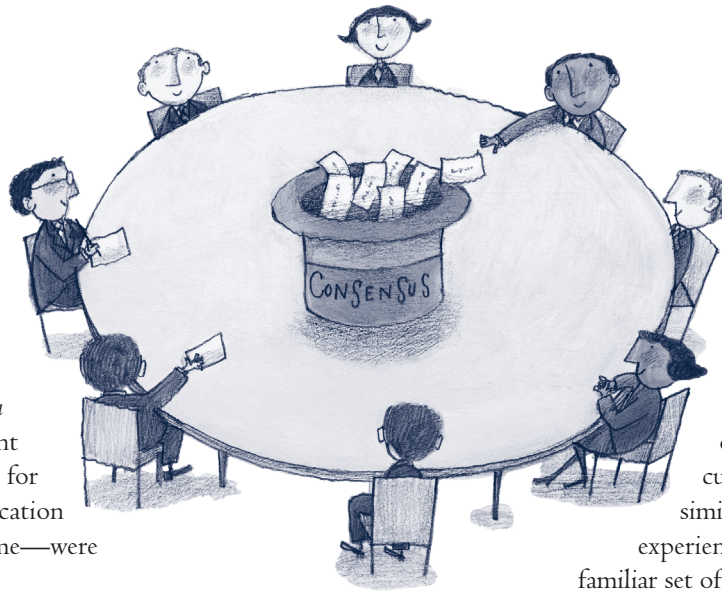


LEVERS ^{FOR} CHANGE: OPPORTUNITIES TO STRENGTHEN CALIFORNIA'S HIGH SCHOOL CURRICULUM



IN 1992, THE CALIFORNIA

Department of Education issued *Second to None: A Vision of the New California High School*. That document articulated a set of goals for the state's public education system that—at the time—were considered ambitious:

“More of our students must be educated to higher levels than ever before. At least 25% of those in the state's high school graduating classes should earn bachelor's degrees; another 25% should earn associate degrees or equivalent degrees from a community college; and at least 40% should make a successful transition from school to work after graduating; reducing the dropout rate to under 10%.”

Today, 15 years later, those goals remain out of reach in California. Many say a credible estimate is that only seven out of every 10 students graduate from high school on time. About half of those graduates go directly to college. And for every two California high school graduates who immediately enter a four-year public university, three enroll in community college. The data are less clear regarding how many go on to earn a

bachelor's or associate's degree. Many students who do not immediately enroll in a public postsecondary institution do get there eventually, but they often struggle to develop the basic reading, writing, and math skills they need to succeed.

In other words, California's high schools have yet to reach the goals described 15 years ago. Nonetheless, there is pressure to set the academic bar even higher. There is currently a call for the state's high schools to reduce dropout rates dramatically and improve basic literacy and numeracy skills. Many people also want more students—particularly those from historically underserved groups—to have access to rigorous courses that prepare them for university admission and more generally for postsecondary success.

It is ironic that while the expectations continue to increase, for most

students in California the high school experience—or at least the organization of the high school curriculum—looks very similar to what their parents experienced. Students take a familiar set of courses to meet graduation requirements; and in most high schools, those courses vary depending on whether students are seen as being on the path to college or not. In many high schools, graduation requirements do not align with postsecondary readiness or workforce expectations.

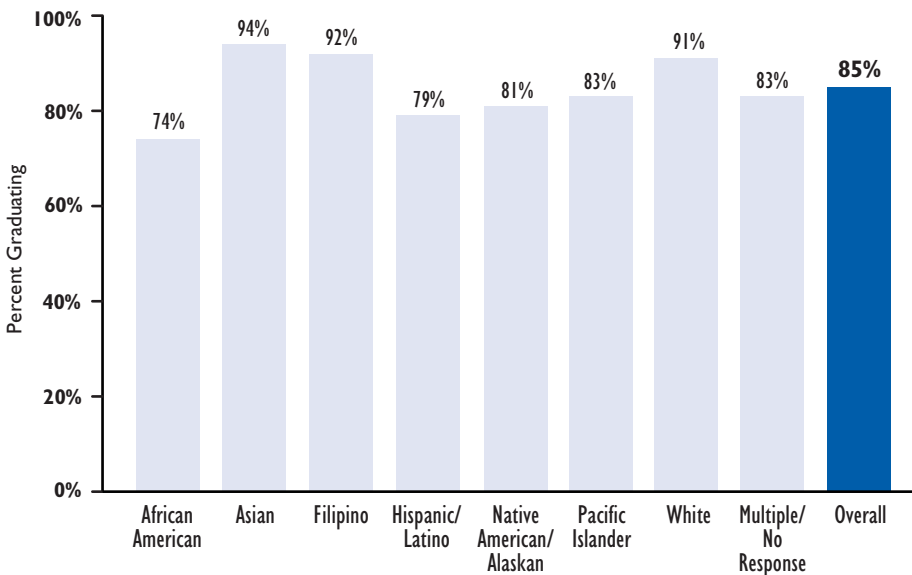
Discussions about how to improve high schools have been going on for decades, often focused on their organizational structure. Increasingly, however, the high school reform discussion is focusing more deeply on the curriculum—what gets taught, how, and to whom. There is little consensus about the solutions, and the conversations are often emotionally charged. High school success is high stakes for students and the adults who care about them, whether they are working hard to pass the California High School Exit Exam (CAHSEE) or enter an Ivy League institution.

figure 1 | High school completion data point to a difficult problem

Of great concern are the social and economic costs when students drop out of high school. In California, high school completion is reported using a variety of measures, all of which are, at best, only estimates. Regardless of the measurements used, however, it is clear that high school completion rates are lower for students from low-income families, English learners, African Americans, and Latinos.

For the purposes of federal accountability, schools use a graduation rate measure that divides the number of graduates by the number of dropouts plus graduates. The table shows graduation rates for various student groups based on that calculation and how they compare to the overall rate of 85%.

Graduation Rates for 2004–05 Based on the Federal NCLB Graduation Rate Measure



In a 2003 study entitled “Connected by 25,” researchers Michael Wald and Tia Martinez cite data indicating that a substantial proportion of young people do not finish high school on time, but only between 5% and 7% of “youth will reach age 25 without having successfully transitioned to independent adulthood.” This has been fairly stable over the last several decades despite high school reforms and other interventions. That suggests that for some young people, the lack of readiness to tackle certain academic material may be “normal” given their circumstances. Those young people may need different options (such as continuation high schools) or a different timetable for academic engagement (i.e., options to move more slowly until they are ready to connect, perhaps through community college).

DATA: CALIFORNIA DEPARTMENT OF EDUCATION (CDE)

EdSource 5/07

There is substantial agreement about some of the major goals that California should pursue for its large, diverse high school population and about where the education system falls short. Virtually everyone agrees that all students need a solid high school education and that the current dropout rate must be significantly lowered.

(See Figure I.) Compelling evidence shows that having a high school diploma is absolutely necessary for success in today’s economy. The consensus is also growing that some postsecondary education or training is essential for almost any young person who wants access to a good career and a middle-class lifestyle.

At the same time, too many of today’s high school graduates do not possess the skills they need to be prepared for work and postsecondary education. And many schools do not provide all their students with the quality of curriculum and instruction needed to develop those skills. Put bluntly: some students receive a great education while others do not, and low-income students of color are disproportionately in the latter category. This concern is reinforced by employer surveys that indicate frustration with entry-level workers and high remediation rates for English and math in California’s community colleges and many California State University (CSU) campuses.

The consensus begins to fall apart, however, when people consider which high school curricular reforms would help the greatest number of students reach these goals. People differ on whether a lack of rigor or a lack of student engagement is the bigger problem—and whether rigor and engagement need to be viewed as separate issues. Some see college and workforce preparation as opposites, and others see them as fundamentally the same in today’s society. Some advocates believe that the most important thing is that local schools offer engaging, varied options for students. Others believe that the state must be forceful in setting more uniform expectations for all.

Overlaying all these issues is the question of the capacity of California’s public school system to develop the skills of high school educators and provide adequate support for students’ needs. It is unrealistic to think that schools can improve simply because they want to or state officials say they should. The changes that need to occur will require a significant investment in professional development for teachers and principals, and

it will require that schools have the staff and programs in place that support successful student engagement and learning.

A serious discussion about these difficult issues may be getting started in California. State policymakers, educators, advocates, and researchers are increasingly focused on how to improve the high school curriculum as a key strategy for serving students better and preparing more of them for postsecondary success, particularly in the schools that need the most help.

In undertaking this discussion, California faces both political and practical obstacles, including a lack of consistency regarding how important concepts are defined and strong differences in how the problems are perceived.

This report addresses these challenges by exploring three key leverage points related to high school curriculum and to the challenge of ensuring that all students—and particularly

economically disadvantaged students—have access to rigorous, engaging high school instruction. The first is the state’s academic content standards. Although these standards are the official blueprint for what students need to know and be able to do, they may not currently have enough influence over what gets taught in classrooms. The second is the powerful role that postsecondary admission and placement requirements play in determining high school course work. And the third is Career Technical Education (CTE), a topic of increasing focus in California. This report explores the ways these strategies complement and conflict with each other, and identifies opportunities for high school improvement. It also describes a new movement in California that advocates a “multiple pathways” approach that seeks to align all three strategies to better prepare all students for college and careers.

California's academic content standards specify a strong basic high school education

California’s academic content standards—which outline by subject area and grade level what state officials believe students need to know and be able to do—have been lauded as some of the “deepest” and “widest” in the country. They call for students to know a great deal about a wide variety of issues and subjects. But the standards have not been implemented consistently across the state, and there is concern that the students who would benefit the most are receiving the least exposure to a rigorous, engaging curriculum. The extent to which there are mechanisms in place at the high school level to build capacity and incentives for schools to meet the standards is also questionable.

California began adopting its voluntary content standards in 1997

Between 1997 and 2005, California’s State Board of Education adopted academic content standards in six traditional subject areas. In 2005, the board also adopted a set of standards for Career Technical Education that align with the academic expectations.

The academic content standards are, for the most part, grade-level specific, though less so for grades 9–12. These standards are voluntary, but they drive the state’s curriculum adoption process. In the case of the four core academic areas, they also form the basis for California’s mandatory student assessment system.

- The science standards are grade-specific through grade 8. At the high school level, they are separated into five scientific fields: physics, chemistry, biology/life sciences, earth sciences, and investigation/experimentation.
- The mathematics standards are grade-specific through grade 7 and then are separated into eight courses—Algebra I through calculus and two levels of probability and statistics.
- The history/social science standards are both grade-specific (except for grade 9, which has no standards) and course-specific in the secondary grades, based on the assumption that schools follow the order recommended by the state.
- Finally, the English language arts standards are grade-specific; but at the high school level, grades 9/10 and 11/12 are specified together.

In the other three subject areas—visual and performing arts, physical education, and CTE—the standards guide curriculum development, but the state has not developed mandatory tests for them.

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California's Minimum High School Graduation Requirements

- Social Science: Three years (including U.S. history and geography; world history, culture, and geography; one semester of American government and civics; and one semester of economics).
- English: Three years.
- Mathematics: Two years (including Algebra I as of 2004).
- Science: Two years (including biological and physical sciences).
- Foreign Language or Visual and Performing Arts: One year.
- Physical Education: Two years.

Approximately a third of the students who graduate from California high schools complete the course sequence for eligibility to a four-year university. The postsecondary options open to the remaining two-thirds are less clear. The community colleges do not publicly articulate readiness standards to high schools, nor do high schools have that information regarding most industry or workforce paths. Students are often left following their high school's minimum graduation requirements and expecting that they will be prepared for something productive and fulfilling immediately after high school.

California's content standards are considered among the nation's most rigorous

California's standards are often held up as models for other states. For example, in 2006 the conservative Fordham Foundation gave California an "A" overall and ranked the state first. The average grade it awarded nationally was a "C-."

Fordham's positive comments about California's standards included the following:

- English: "Their balance and depth is impressive. The standards are clear, they are specific, they are measurable, and they address all areas fully."
- Mathematics: "If any state has math standards right, it's California."
- Science: "[The standards and frameworks] are both brief and comprehensive. They use plain language and, unlike many of their peers, they avoid errors and ambiguity."
- U.S. History: "California's standards are excellent and should serve as a model for other states."
- World History: "Its standards tell

the world's story very well...the state deftly guides educators through the material from world religions to modern world politics, and it never slips in providing in-depth information."

Local school districts remain the decision makers when it comes to the high school curriculum

California's academic content standards provide guidelines that state policymakers expect school districts to follow, but they are not mandates on what will be taught in the state's high schools. California's 329 unified and 88 high school districts choose their own graduation requirements (within state parameters), design their own high school courses, select their curriculum materials, and decide how students will be placed in those courses. That flexibility inevitably results in differences in what is taught and affects the overall quality of instruction among various districts.

The variation in size and circumstance among California schools and districts also contributes to differences in both the scope and quality

of the high school curriculum. A high school of 200 students in Lassen County faces different challenges than one with 4,000 students in Los Angeles. The capacity of a 500-student high school district to provide the professional development its staff needs to implement a new curriculum is markedly different from the resources a 75,000-student unified district can bring to bear. To a large extent, the state takes a hands-off approach to curriculum and professional development at the high school level, at least compared to how it has approached grades K–8.

State law stipulates a course of study for grades 7–12 and a set of minimum high school graduation requirements (see the box to the left). Local school boards retain legal authority to set local courses of study and graduation requirements that exceed the state minimums; as a result, those requirements also vary by district.

Within this basic framework, the courses high schools develop, the instructional materials they choose, and the capacity of their teachers to deliver the curriculum combine to drive what students learn. Therefore, the mechanisms used to decide high school curricular materials carry great weight. Currently, those mechanisms are only loosely tied to the state standards.

The California State Board of Education (SBE) provides substantial guidance regarding what it expects schools to teach and students to learn. Every six to eight years, the SBE adopts a new curriculum framework for each subject, placing the content standards in an overarching instructional approach and describing criteria by which instructional materials are to be evaluated. Using those criteria, California's 18-member Curriculum Commission evaluates and recommends materials

for adoption by the SBE in grades K–8. State instructional materials funds are provided to purchase those materials.

In sharp contrast, the SBE does not adopt instructional materials for grades 9–12. Districts select their own materials for those grades. To qualify for state textbook monies, districts must certify that their materials align with state standards. They have several tools available to help guide curriculum development, most notably the state’s curriculum frameworks. In addition, they can use the “standards maps” some publishers submit with their materials that specify how the materials align with the content standards. Finally, the CDE website recommends a process for high schools to follow when establishing a standards-aligned instructional program and lists questions districts should ask during that process.

Professional development, particularly tied to specific curriculum programs, is largely left to local districts. State support pays for three days of noninstructional time for teachers per year. In addition, some professional development in reading and math has been made available through Assembly Bill 466.

State policy includes few leverage points for implementing the standards

Concerns about high school reform in California have intensified as the state’s accountability system has shed a bright light on student performance. The state’s Academic Performance Index (API)—a composite index showing school-level performance based on students’ scores on the California Standards Tests (CSTs) and the California High School Exit Exam (CAHSEE)—has consistently shown high schools to be lower performing than elementary and middle schools. Since California introduced the API

in 1999, all levels of schools have improved; but high schools have done so most slowly. (See the box above for more about high school performance measures.)

The most direct strategies that state policymakers have adopted to influence the high school curriculum are state tests. In particular, the CAHSEE sets a minimum standard for what students need to know to receive their much-coveted diploma. Although tougher than not having an exam, passing the CAHSEE is not the equivalent of proficiency in all core subjects through 12th grade. It

also falls well short of what is expected for admission to a four-year university. Less clear to students and parents—and perhaps to some educators—is that the ability to pass the CAHSEE is likely not enough to prepare a student for success in community college. That is particularly true for the more demanding programs, including transfer programs to a four-year university.

In addition, the CAHSEE covers only English language arts and math, a far cry from the kind of comprehensive learning across subject areas that is expected of high school students. (See

California’s testing and accountability systems shed light on high school performance

High school test taking and results on the California Standards Tests (CSTs) indicate that reforms in recent years have had some positive effects on the curriculum students take and on their performance.

- Between 2003 and 2006, enrollment in Algebra I increased dramatically, as did enrollments in geometry and Algebra II but to a lesser degree.
- A larger percentage of students are scoring proficient on CSTs in these subjects.
- Enrollments in biology, chemistry, and physics have also increased.
- A higher percentage of students at each grade level (9–11) are scoring proficient or advanced on the English language arts CST as well.

California’s Academic Performance Index (API) raises concerns.

- The median API for high schools has consistently been lower than that for elementary or middle schools. For 2006, the median API Base score for high schools is 700, compared with 758 for elementary schools and 724 for middle schools (on a scale of 200 to 1,000).
- High schools have also had less success meeting their API growth targets. For 2006, 39% did so compared with 58% of elementary schools and 43% of middle schools.

Data for high schools making adequate yearly progress (AYP) based on the No Child Left Behind (NCLB) metric are more difficult to interpret.

Tenth grade scores on the California High School Exit Exam (CAHSEE)—which only covers math and English language arts—are the primary measure of AYP. In addition, schools can fail to meet federal goals based on either participation rates or scores for any subgroup of students.

- Less than half of the high schools in California participate in Title I. About a third of California’s 1,048 Title I high schools are in Program Improvement (PI) because they failed to make AYP under NCLB. That represents about 13% of all high schools in the state.
- A larger proportion of elementary and middle schools are in Title I and thus are eligible for PI. About a third of Title I elementary schools and two-thirds of Title I middle schools are in PI.

DATA: CALIFORNIA DEPARTMENT OF EDUCATION (CDE)

CAHSEE Expectations and Content Coverage

All students are required to take the California High School Exit Exam (CAHSEE) in the 10th grade. If they fail to pass either part—English language arts or math—they have two more opportunities in 11th grade and three more in 12th grade to retake one or both parts.

For both parts, a scale score of 350 is needed to pass. That equates roughly to 55% correct on the mathematics section and 60% correct on the English section.

For purposes of school and district accountability under federal law, the adequate yearly progress (AYP) goal is proficiency on these tests, which requires a somewhat higher score—about 70% correct in English and 75% in math.

CAHSEE is generally recognized as a stronger minimum standard for high school graduation than was previously in place in California. That said, it falls well short of the level required for students to take on college-level course work.

The English section addresses state content standards through grade 10. In reading, this includes vocabulary, decoding, comprehension, and analysis of information and literary texts. In writing, this covers writing strategies, applications, and the conventions of English (grammar, spelling, and punctuation). Approximately half the questions are on writing, with one essay—a choice of an expository essay, biography, persuasion piece, or business letter. A student can pass the English section with a failing score on the essay.

The mathematics section addresses state standards for sixth and seventh grades, plus Algebra I. The exam includes statistics, data analysis and probability, number sense, measurement and geometry, mathematical reasoning, and algebra. Students are also asked to demonstrate a strong foundation in computation and arithmetic, including working with decimals, fractions, and percentages.

The full test blueprints for both sections—which list the specific standards tested and the number of questions per standard—are at: www.cde.ca.gov/ta/tg/hs/resources.asp

In spring 2006, student performance on the CAHSEE raised alarm as it became clear that about 37,755 students—or about 8.6% of California's high school seniors—would not pass. Preliminary results for the class of 2007 are somewhat better according to an April 2007 release from the California Department of Education.

the box above for more information regarding the CAHSEE.) It is also debatable that an assessment is the most appropriate lever to ensure or spur student learning.

The California Standards Tests cover all four core subject areas, and high schools must administer them to students in grades 9 through 11. These tests are used to judge the effectiveness of schools and districts, but students experience no particular consequences based on their

performance. Although CST results are reflected in schools' API scores, they also have very little impact on whether a school or district meets federal expectations for adequate yearly progress (AYP). Tenth-grade students' scores on the CAHSEE largely determine a high school's AYP.

Taken as a whole, the CSTs as they are currently implemented and reported appear to be a rather weak lever for compelling high schools to align

their instruction with the state's demanding academic standards, though they do indicate how well high schools are teaching to state standards. Little else in state policy currently puts pressure on high schools to take on the serious and demanding work of aligning their curriculum and instruction with the high standards adopted by the state of California. To the extent alignment is occurring, it is through the actions of school districts and the implementation of local policies.

An important question concerns the capacity of educators to accomplish this goal, particularly absent high-quality and targeted professional development for teachers. In *Aiming High*, which the California Department of Education (CDE) bills as a how-to document for implementing a standards-based educational system, ample and appropriate professional development is characterized as essential. The document states bluntly that the state's three days of paid professional development "will not provide nearly enough time to implement standards-based reform." It urges local schools and districts to find additional time through strategies that include coaching, paying for additional days, ongoing staff collaboration, and online programs.

Some people believe that the problem is compounded by the fact that many teachers are not fully credentialed in the subjects they are teaching. According to a 2006 report by the Center for the Future of Teaching and Learning (CFTL), substantial portions of the state's high school teachers are teaching "out of field." CFTL considers teachers as teaching out of field if they are fully credentialed but do not have subject-matter authorization in their assigned subject. Based on that definition, they found 12% of math teachers, 15% of English teachers, 18% of social science

teachers, and 20% of physical science teachers were teaching out of field.

Strengthening the alignment of high school curricula with the 9–12 academic content standards could help improve California’s high schools. If all of California’s high school students were proficient based on the standards, and instruction was done in an engaging way, students would at a minimum have a good high school education. Many believe the standards are high enough that they would be well prepared for success at the University of California (UC) or CSU campuses. However, existing state policies to either encourage or require districts to complete that alignment are relatively limited. Local educators’ lack of capacity to do so is a serious obstacle as well.

UC and CSU eligibility is a driving force behind which courses are taught in high schools

While California’s academic content standards are voluntary, every high school must provide its students with access to the courses required for UC and CSU admission. University eligibility is a very potent incentive for high school students and teachers. When surveyed, the vast majority of students say they want to go to college, most parents want their children to be prepared for college, and high school educators know that their students’ college-going rates are an important and highly visible measure of their school’s success. Those realities make university eligibility requirements an important leverage point for improving high school curricula and instruction in California.

Those requirements are often referred to—in shorthand—as the “college prep” curriculum. And in California that is often synonymous with the completion of the “a-g” course sequence required for eligibility for the state’s two public university

systems. That shorthand obscures the deeper question of what specific skills and knowledge students need to succeed at college-level academics, and the broader question of what students need to know for success in other postsecondary settings and in the workforce.

What does college preparation or postsecondary preparation really mean in terms of the high school curriculum? In California, the answers to that question lie along a continuum that first and foremost reflects the expectations and requirements of the state’s three-tiered system of public universities and colleges: the UC system, the CSU system, and California Community Colleges. Beyond that, there is a growing consensus that most high school graduates will need some kind of postsecondary education. Many argue that the skills and knowledge required for student success in technical training programs—or in today’s work world more generally—are quite similar to what is required for college academics.

The UC system takes the lead in setting college preparation standards in California

As the most selective public postsecondary system in the state, UC drives much of the public policy on university admission, and thus on postsecondary preparation. The course requirements for UC eligibility, commonly called the “a-g” requirements, are a prime example of this. The “a-g” requirements are fundamentally course-taking requirements. In California, those requirements are often synonymous with the words “college preparation” without policymakers or the public clearly understanding what they actually include or how they affect the quality of high school instruction. To make things even more confusing, students, their parents, and teachers

DEFINING COMMONLY USED TERMS

What is “college prep”?

Broadly defined, “college prep” might be seen as the combination of course taking and student learning that prepares a student for success in a postsecondary learning environment. Those postsecondary options include technical institutes, community colleges, the California State University (CSU) system and similar four-year colleges, and more selective universities such as the University of California (UC) system. The preparation needed to gain admission to each of these options differs in terms of course requirements but not in the basic expectation that students need a strong grounding in high school academics, particularly English and mathematics.

Students wanting to attend a technical program or pursue a two-year degree at a community college have a vast array of options but little guidance about how to prepare. Generally, students need to master high school-level work to qualify for these programs and be successful, but specific course-taking requirements may be minimal or nonexistent.

Students wanting to be eligible for the CSU system (or comparable private and public universities) need to take the 15 courses included in the “a-g” requirements but may not want or need to take additional college prep courses.

Students seeking admission into the most selective UC campuses (and other highly selective universities) generally not only need to meet the “a-g” requirements, but also must take additional rigorous academic courses, often including Advanced Placement (AP) and honors classes.

If “college” is a term now used to cover all these postsecondary options, then college prep also includes a broad spectrum of expectations for students.

often assume that college prep curricular paths in high school will make students eligible for UC or CSU, but these paths are not always aligned with “a-g.” And little attention has been paid

Major Features of the California Master Plan for Higher Education

Compared with other states, California has a clear and relatively transparent organizational structure for its postsecondary education systems. The state's Master Plan, adopted in 1960, established a principle of universal access and choice. It also differentiated between the three higher-education systems based on their function and admission pools.

Each segment has its own governance system, and the California Postsecondary Education Commission acts as a coordinating body. The functions of the three segments differ as follows:

- University of California (UC) is California's primary academic research institution. It provides undergraduate, graduate, and professional education and has exclusive jurisdiction for doctoral degrees (CSU can award joint doctorates) and for instruction in medicine, law, dentistry, and veterinary medicine.
- California State University (CSU) has as its primary mission undergraduate education and graduate education through the master's degree (including professional and teacher education).
- California Community Colleges (CCCs) provide academic and vocational instruction for older and younger students through the first two years of undergraduate education (lower division). The community colleges are also authorized to provide remedial instruction, English-as-a-second-language courses, adult noncredit instruction, community service courses, and workforce training services.

The Master Plan also specifies which students are to be admitted to each system:

- The UC institutions select applicants from among the top one-eighth (12.5%) of the high school graduating class;
- The CSU campuses select applicants from among the top one-third (33.3%) of the high school graduating class; and
- The community colleges admit any student who is a high school graduate or age 18 and capable of benefiting from instruction. (Under certain circumstances, high school students and 16- and 17-year-olds can also attend.)

For both the UC and CSU systems, the goal is for the specified portion of high school graduates to have a place—but not necessarily at their first-choice campus or in their first-choice major.

to how the “a-g” requirements relate to the state's more recently adopted academic content standards or the extent to which the courses required are relevant for entry into the community colleges or the workforce.

Historically, the CSU and UC systems had different, but similar, course requirements. They aligned their expectations in fall 2003. Students must successfully complete at least 15 qualifying “a-g” courses to be eligible for admission to either university system. At a minimum, success means a “C” grade, but each system also has a minimum expectation for students' cumulative grade point averages and

standardized test scores. The box on page 9 outlines the general course requirements by subject, including how many years of each a student must take.

UC's Board of Admissions and Relations with Schools (BOARS) establishes the subject areas and course sequences that make up the “a-g” requirements. BOARS is a committee of the University's Academic Senate and includes faculty representatives from each of the 10 UC campuses. The Academic Senate sets the conditions for admission, subject to final approval of the Board of Regents. CSU has agreed to accept this and is not involved in “a-g” policymaking or in the course-approval process.

The UC Office of the President (UCOP) states that the “a-g” requirements are meant to ensure that entering students:

- Can participate fully in a first-year, university-level program in a broad variety of fields of study;
- Have completed the necessary preparation for university-level courses, majors, and programs;
- Have attained a body of knowledge that will provide breadth and perspective to more advanced studies; and
- Have acquired essential critical thinking and study skills.

The “a-g” requirements set out a general framework that students must follow to be eligible for UC or CSU admission at the end of high school. These requirements are similar to university admission requirements throughout the United States. However, California is distinctive in the extent to which its public university system approves the specific courses that qualify as “college prep.”

UC and CSU aligned course-taking requirements in 2003

CSU's adoption of the “a-g” sequence in 2003 followed decades of discussion about raising the system's eligibility requirements.

When California's Higher Education Master Plan was adopted in 1960 (see the box above), there was extensive discussion about the need to change the entrance requirements for the then-state colleges (now CSU). At that time, students' grade point averages (GPAs) per se were not considered. Students needed a total of 14 A's and B's in semester grades and to complete seven year-long courses (other than ROTC and physical education) to be admitted. There was a substantial effort to introduce some kind of subject-matter requirement, but it failed during the Master Plan discussions.

In the mid-1970s, high schools across the country departed from structured college prep courses, and CSU found that it had a larger proportion of underprepared students than before. In the late 1970s, CSU introduced course requirements in English and mathematics, but that did not have much effect on students' academic readiness. Years of debate about strengthening the requirements ensued with little action.

In the late 1990s—when CSU remediation rates were at about 50% in mathematics and English—the CSU and UC systems began conversations about aligning their course-taking expectations. As a UC Academic Senate memorandum from Oct. 25, 1998 stated: “Alignment of the UC and CSU course pattern requirements would be a major boon to high school students, their parents, and their counselors, when planning for college attendance at public institutions of higher learning in the State of California.”

Both UC and CSU leaders believed that their systems stood to gain by aligning the eligibility requirements. CSU hoped it would admit better-prepared students, and UC saw this as a way to increase its pool of prospective students to the 12.5% stipulated by the Master Plan. (It was at slightly more than 11%.) The change, which went into effect in fall 2003, augmented what was then called “a-f” by adding a required course in visual and performing arts, formerly just a CSU requirement. (See the box above.)

The quality of “a-g” courses is far from uniform

The courses provided in California's high schools, whether or not they are labeled as college prep, are only as good as the quality of instruction, curricular materials, and level of

General Admission Requirements for UC and CSU by Subject Area

The “a-g” requirements include:

(a) History/Social Science—Two years, including one year of world history, cultures, and geography and one year of U.S. history (or one-half year each of U.S. history and civics or American government).

(b) English—Four years of college preparatory English that include:

- Reading. Extensive reading of a variety of literary genres and full texts, including classic and modern.
- Writing. Frequent and regular writing, including substantial, recurrent practice writing extensive, structured papers. Student must demonstrate understanding of rhetorical, grammatical, and syntactical patterns, forms, and structures.

(c) Mathematics—Three years of college preparatory mathematics that include the topics covered in elementary and advanced algebra and two- and three-dimensional geometry. Four years are strongly recommended.

(d) Laboratory Science—Two years of laboratory science providing fundamental knowledge in at least two of these three disciplines: biology, chemistry, and physics. Three years are strongly recommended. Courses are allowed that incorporate applications in some other scientific or career-technical subject area, or that constitute the final two years of a three-year sequence in Integrated Science with rigorous coverage of at least two of the foundational subjects.

(e) Language Other Than English—Two years in a single language other than English (including American Sign Language). Three years are recommended. Courses should emphasize speaking and understanding and include instruction in grammar, vocabulary, reading, and composition. The minimum performance objectives are: 1) sustain a brief conversation on simple, everyday topics and know the basic structural patterns in the present, past, and future tenses, the subjunctive, and commands; and 2) summarize orally and in writing the main points of a relatively simple reading passage.

(f) Visual and Performing Arts—One year of dance, drama/theater, music, or visual art.

(g) College Preparatory Elective—One year, chosen from additional “a-f” courses beyond those used to satisfy the requirements above, or courses that have been approved solely for use as “g” electives.

student engagement found in classrooms. UC's course approval and quality control processes are crucial links between the policy of requiring the “a-g” courses and the actual content to which students are exposed. The approval and monitoring processes have both been openly criticized, and the approval process has recently been strengthened significantly.

The course-approval process has been improved in recent years

In order for a course to qualify as part of the “a-g” sequence, high schools must submit the course description

for approval by the UC system. Before a California high school can establish an “a-g” course list, it must either be accredited by the Western Association of Schools and Colleges, or be a candidate for accreditation.

Every year, UC asks principals to update their high school's course list, and the vast majority of high schools throughout California comply with that request. If a course list is not updated, UC uses the most recent list available; but students can suffer the consequences because they may not receive credit for a new “a-g” course if it is not reflected on the official list.

Although UC expects principals to update the list, typically it is high school teachers who are responsible for drafting course descriptions for approval. The preferred deadline for submission is every February, and the reviews are completed by April or May so schools have time to inform

completed predominantly by one UC employee. UC did not provide feedback for schools about why courses were not approved, and the entire process was not seen as user-friendly for high schools. Questions about the quality and consistency of the review process led to other major changes.

When one school has had a course approved, others can use the same course curriculum without having to go through the approval process. As a former UCOP employee stated, “There is a tremendous reliance on bootstrapping.” Schools can use this process for entire programs of study as well. For example, CDE developed an agriculture curriculum and course sequence that is approved by UC. When a school adds those course offerings, they are automatically approved as long as the school uses the approved curriculum.

Several years ago, an effort to streamline the process included the formalization of “program status” for previously approved curricula offered through various organizations or programs, such as Advanced Placement (AP), International Baccalaureate (IB), AVID (Advancement Via Individual Determination), Regional Occupational Programs (ROPs), and the California Department of Education’s Agriculture Education Program. These programs must meet several criteria, including having a standardized curriculum taught consistently from school to school, providing necessary professional development for teachers, and maintaining program oversight and monitoring. Programs are re-evaluated by BOARS every five years or so. A similar approval process is available for courses consistently taught at different schools within the same district.

As a result of this process, UC recently found that the AP program was not meeting the criteria because it lacked the type of professional development expected to ensure curricular consistency. UC gave the College Board two years to come into compliance, and as a result the College Board is now auditing its AP courses.

Experts do not seem overly concerned about the automatic processes

Many argue that the skills and knowledge required for student success in technical training programs—or in today’s work world more generally—are quite similar to what is required for college academics.

students of any changes for the upcoming school year. However, schools may submit new courses and/or update their course list at any time through mid-October. The course list is then used by students when they apply to colleges in November.

In deciding whether to approve a course, UC looks for evidence that it meets both subject-specific expectations and general guidelines agreed upon by UC faculty. The latter includes such things as:

- Is academically challenging;
- Involves substantial reading and writing;
- Includes problems and laboratory work, as appropriate;
- Shows serious attention to analytical thinking as well as factual content; and
- Develops students’ oral and listening skills.

By all accounts, the “a-g” course-approval process has improved dramatically over the past six years. Since 2002–03, high schools have submitted updates and additions to their course lists online. Prior to that, it was a paper-and-pencil process

For example, a team—headed by an articulation coordinator and including several part-time course reviewers with extensive admissions experience—now reviews the courses.

UC provides online checklists that outline the criteria against which submitted courses will be evaluated. Assuming a school provides the necessary course information, the most common reasons a course could be rejected include:

- Insufficient academic or theoretical content;
- Focus is too narrow or specialized;
- Addresses too many topics or shows a lack of depth;
- Too much focus on skills related to application rather than theory;
- Too much focus on tools and technology rather than content knowledge; and/or
- A lack of prerequisites.

Individual reviewers read the submissions, bringing any questionable course descriptions to the full committee for discussion. UC does not review the qualifications of high school teachers who will be teaching the course or otherwise go beyond an examination of the materials submitted.

for course approvals. However, they cited more general problems with the lack of systematic quality control once courses are approved.

UC does not monitor the quality of courses once they are approved

Currently, UC does not have a process for monitoring or re-evaluating a course once it has been approved. Courses stay on the list even if they were approved decades ago, and schools rarely inform UC if a course has been revised. This lack of a systematic quality-control process means that some courses likely do not meet the university's expectations and, consequently, students might not be receiving the kind of college preparation they need.

UC created a plan several years ago for conducting regular re-evaluations of previously approved courses, but it has not been implemented. Experts see this as largely a resource and capacity problem within the UC system given current funding and staffing levels.

These experts acknowledge that there is likely a high degree of variability in the quality and content of "a-g" courses in high schools statewide. One reason may be because the "a-g" course requirements are somewhat general guidelines, rather than specific standards in the current sense of the word. The guidelines do not provide much help for teachers regarding the specific knowledge and skills required, or how to reach those goals. Further, interpreting "a-g" requirements has been difficult because the universities do not speak with one voice. For example, some faculty members want students to master procedural math and take derivatives, but others want more conceptual approaches to math. Consequently, it is hard for BOARS to develop highly specific language about the expected content of "a-g" courses.

More specificity may be on the way. A new UC task force will be working to add details to the mathematics and science course expectations and to reference the "a-g" requirements to high school content standards.

In addition, once a course is approved, high schools can assign

Experts acknowledge that there is likely a high degree of variability in the quality and content of UC-approved "a-g" courses in high schools statewide.

whichever teacher they wish to the class. There are no ongoing requirements regarding teacher credentials or training.

The state aligned its standards-based test with CSU readiness expectations

Although the lack of consistent course quality has implications for UC students' readiness, it is a more substantial issue for CSU-bound students. UC applicants are the state's highest-performing students, and many go above and beyond the minimum "a-g" course expectations to compete for a spot at their top-choice institution within California and at selective campuses nationwide. For example, although the official systemwide requirement is for high school students to complete 15 "a-g" courses, the majority of students who are admitted to a UC campus take far more. The average student who gains admission to UC completes about 23 UC-approved courses.

By design, the pool of prospective students is not as competitive for CSU. They tend to take fewer "a-g" courses and can qualify for admission with a lower overall grade point

average and lower college admission test (SAT or ACT) scores. If the quality of courses they take at their high school is poor, then they are more likely to find themselves underprepared for college work.

When the CSU admission requirements were changed in 2003, about half

of CSU entrants were being placed in remedial courses. Although entering freshmen that year had taken the "a-g" sequence, the remediation problems remained.

Consequently, in November 2003, after conversations with faculty members about student readiness in their classes, CSU took a further step. The system announced the development of the Early Assessment Program (EAP)—an attempt to increase student readiness that includes:

- The augmentation of the 11th grade California Standards Tests (CSTs) in mathematics and English language arts to include items that indicate readiness for CSU;
- Teacher preparation aligned with CSU's expectations; and
- Recommendations for new course work for 12th graders who need additional help to prepare for college.

Faculty members told CSU administrators that entering students need to learn better how to read critically, analyze, synthesize, write, and do college-level mathematics. CSU decided that an early warning system, coupled with the teacher and

figure 2 | CSU/UC Eligibility* Rates by Ethnic Group for 2004–05

Data on UC/CSU eligibility indicate that traditionally disadvantaged ethnic groups are substantially less likely to complete the course sequence. The eligibility rates below relate to course taking only and do not reflect all the requirements students must meet for admission, such as the ACT and SAT college admission tests. These course-taking rates have held relatively steady in recent years despite standards-based reform efforts and local initiatives to increase student access to these courses.

Student Ethnic Group	% Eligible
African American	25.2%
Asian	58.7%
Filipino	46.6%
Hispanic/Latino	24.0%
Native American/Alaskan Native	23.1%
Pacific Islander	27.7%
White	40.9%
Multiple/No Response	31.0%
Total Eligible	35.2%

* Based on completion of “a-g” courses only.

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instructional supports, would be the best way to make those changes. Participation in the program is voluntary for both school districts and students.

In 2006, according to CSU online data, about half of all high school juniors in the state took the expanded CST in English language arts, and 23% were assessed as college ready. About a third of juniors took one of the two CSTs in math, and slightly more than 55% were judged to be ready for college-level work.

So far, remediation rates in CSU have not improved, remaining at about 50%. But other data from the CSU system provide further perspective and are more encouraging. A web-based report of remediation rates for the entering freshmen in 2005 and their status a year later indicates that most students are able to “demonstrate full proficiency” within a year of their admission. That year, 55% of regularly

admitted first-time freshmen needed remediation based on CSU entrance tests. A year later, according to CSU, 83% of those students had demonstrated proficiency, and 74% were still enrolled.

Because EAP went into effect soon after the UC/CSU alignment of the “a-g” courses, it is difficult to tell what effect either reform alone has had on student preparation for CSU.

Do all students need to take the “a-g” sequence?

The number of students that complete the full “a-g” sequence, gain admission to CSU or UC, and still need remediation suggests a problem. It may be that the courses are not truly aligned with university expectations. This situation might indicate that not all “a-g” classes are taught well, that quality varies across schools, and perhaps that the UC “a-g” course-approval process could be improved.

Data also indicate troubling disparities in the educational opportunities offered at different schools and to different groups of students. Despite state law requiring them to do so, many high schools do not offer all their students access to the complete set of “a-g” courses. Others offer the classes, but the actual content is insufficient to prepare students for university-level work.

UCLA’s *Roadblocks to College* report found that “many of the state’s high schools provide insufficient college preparatory classes, too few qualified teachers to teach those classes, and too few counselors to guide students along the path to college.” According to that report, in 2004–05 fewer than half (45%) of California’s comprehensive high schools offered enough “a-g” courses to enable all students to take them.

It seems reasonable to assume that these disparities in course offerings would be reflected in similar statistics for UC/CSU eligibility based on student course completions. As Figure 2 shows, the available eligibility rate data are consistent with this, showing that while 35% of high school graduates overall complete the “a-g” courses, only 25% of African American students and 24% of Latino students do so.

Much of the recent public and political debate about the high school curriculum has been about how to ensure that all students are prepared for the UCs, the state’s most selective public universities and some of the most selective nationally. Politically, this makes sense. UC has historically driven much of the upper-end curricular change in the state’s high schools, and the state needs to be concerned about the lack of historically underserved students entering and succeeding in UC institutions.

A strong, vocal advocacy movement has focused on expanding college access by making the “a-g” courses the default curriculum in California high schools. Their concerns—fueled by the realities of unequal access in many high schools—are that the general education (noncollege-prep) and vocational education options become dumping grounds that rob primarily poor and minority students of the chance to go to college.

Others question whether requiring every student to take the full course sequence required for admission to California’s four-year universities will meet the needs of the majority of the state’s high school students, or be relevant and engaging for them. Although the state has a responsibility to ensure that all high school students have equal access to information about UC and CSU preparation and to “a-g” courses, the majority of California students who matriculate to college directly from high school will enter a community college. The full battery of “a-g” courses is not necessary for admission there, and it is not clear that those courses are needed for students’ success in many programs. The California Postsecondary Education Commission reports that 6.8% of California high school graduates in 2005 attended UC that fall, 10.7% attended CSU, and 29.0% attended a community college.

Entrance requirements for community colleges vary by campus

California’s community colleges are conspicuously absent from most state policy discussions of college readiness. That disconnect is important for several reasons. Some students enter community college intending to transfer to four-year universities, but even more attend with the hope of getting the education or training they need to enter a technical field

and find a good job. Although community colleges do not have course-taking requirements for admission, they do have standards that students must meet to take the college-level, credit-bearing courses that make those goals attainable.

Statewide data indicate troubling disparities in the educational opportunities offered at different schools and to different groups of students in California.

Stanford University Bridge Project researchers who interviewed students for a 2003 report, *Betraying the College Dream*, found that many high school students, their parents, and even their counselors and teachers are uninformed about the academic preparation needed to succeed at community colleges. The Bridge Project reported a serious disconnect between the K–12 system and community colleges regarding academic standards and placement policies. For example, many high school students believe that community colleges have no standards, and consequently that they do not need to take particular courses to prepare. Graduates are often surprised and dismayed to learn that though they received a high school diploma, they are placed in remedial classes at the community college.

Remediation rates for California’s community colleges are particularly difficult to track, but many community college districts report that about 75% of their incoming students are not ready to take college-level work in English language arts and mathematics. These numbers include both students who proceed directly from high school to college and returning adults.

A strong tradition of local autonomy for the community colleges means that each community college district or campus has its own academic standards, course prerequisites, and placement exams. The chancellor’s office does not have a strong mandate

to create systemwide changes in these areas, and academic senates at the campus and state levels are quite powerful. So for a variety of reasons, these variations are strongly entrenched and have to date been resistant to statewide efforts for change.

In March 2007, the California Community College Board of Governors created a task force to examine the feasibility of developing “a battery of state-owned and approved online tests” that could be used at the various campuses. This task force is scheduled to complete its work and present its findings in October 2007.

Getting beyond the slogan of “college for all” to what postsecondary preparation really means for high school curricula

A rigorous comparison of the “a-g” sequence to the state’s mandatory high school graduation requirements, the preparation needed for community college work, and the state’s academic content standards would be enlightening for educators and policymakers. And it would help make current policies more transparent for students. For example, if being proficient on the academic standards would increase students’ chances of being ready for college-level course work, knowing



DEFINING COMMONLY USED TERMS

What is Career Technical Education (CTE)?

CTE is *not* traditional vocational education, which emphasizes preparing students for entry-level positions and does not typically lead to postsecondary education.

In some European countries, CTE takes place through a dual system that places students either in formal apprenticeship systems or in schools where students also learn related academic content. Typically, this type of system steers young people into one path or the other at about age 15.

It is common for students to take CTE courses after they graduate from high school at community colleges and some private institutions. Typically two years in length, these programs include occupational content and supportive academic course work.

New forms of CTE offered in high schools have emerged since the late 1980s. These often attempt to integrate academic and occupational learning, and they keep open students' options for college.

The California Department of Education website officially defines CTE as: "A multiyear sequence of courses that integrates core academic knowledge with technical and occupational knowledge to provide students with a pathway to postsecondary education and careers."

that might change some students' study habits. In addition, the findings could help schools identify in which areas they need to strengthen their curricula to ensure that all students have access to the postsecondary segment they want to pursue.

On the face of it, the main differences are that the "a-g" sequence requires students to take a foreign language for at least two years; complete the math sequence of Algebra I, geometry, and Algebra II, rather than just Algebra I; and take labora-

tory sciences instead of more general science courses. These course requirements are substantial barriers for some students. They are also subject areas that perennially have a shortage of qualified teachers. Although necessary for admission to most traditional four-year universities (including the UC and CSU systems), these specific courses may not be essential to a student's ability to succeed in a rigorous postsecondary program at community college or a technical training school.

Course taking is not the only way to evaluate student readiness

Nationally, the American Diploma Project is detailing postsecondary and workplace readiness standards based on skills and knowledge, not course taking. Its research shows that the "real world" expectations developed through their initiative "are significantly more rigorous than current high school standards, resulting in an expectations gap that explains why many high school graduates are not prepared to succeed when they arrive at college or the workplace."

In his book, *College Knowledge: What it Takes for Students to Succeed and What We Can Do to Get Them Ready*, University of Oregon professor David Conley presents a comprehensive look at the core content knowledge, habits of mind, and foundational capabilities (e.g., critical reading, reasoning and logic, interpretation, analysis, a spirit of inquiry) that he and his colleagues have labeled "Standards for Success." His work shows that college preparation entails more than the learning of academic knowledge and skills.

This national work highlights the importance of California schools ensuring that the courses students must take for university admission also prepare them for university-level academic work. At a minimum, these

courses must meet the standards articulated by UCOP in its course-approval process. Doing so will set the bar higher for all high school curricula. Local educators also need to make sure that students and parents have a clear understanding of both the courses and the skills needed to pursue the full range of postsecondary options, from immediate employment after high school graduation to enrollment in the most elite university.

The state can support this effort by providing the resources and training schools need to counsel students regarding their opportunities and choices. It can also encourage the postsecondary sectors to state their course-taking requirements clearly and publicly and to work with K–12 to connect expectations across the systems. EAP could provide a good model in terms of embedding postsecondary expectations into K–12 courses and assessments, and aligning high school teacher professional development with postsecondary expectations.

This all needs to be done without creating dead-end curricular tracks for students or only offering challenging course work to those most economically advantaged. The state may need to take an active role in changing the current status quo to ensure that all students have access to the course work needed to pursue further education at the community college, CSU, or UC of their choice, or through a career-preparation program. The state could provide more rigorous oversight or local schools and districts could make a more concerted effort to give every student a realistic chance to take "a-g" courses if they choose and to get the support they need to succeed. New programs in Los Angeles Unified School District and elsewhere that require schools to offer "a-g" courses to all students might provide an

increased understanding of how this can be done and the challenges involved.

Will new Career Tech Education standards spur a major overhaul in the classroom?

A third area of focus for curricular improvement in high schools involves a dramatic strengthening of the strand traditionally referred to as vocational education and now called Career and Technical Education (CTE). The CTE movement's primary goal is to integrate academic knowledge and skills into courses that are academically rigorous and also relevant and engaging. Many advocates believe that this blend would help address part of the drop-out problem as well as increase student motivation and performance more generally.

An important spokesperson for this movement is Gov. Arnold Schwarzenegger, who has used his office to raise the visibility of CTE issues, sponsor related legislation, and push for additional funding. Legislators, researchers, and other state policymakers are also taking notice. The concurrent reauthorization of federal legislation adds more momentum.

Advocates for a new approach to career-focused education in the form of CTE hope proposed changes will help ensure that more students graduate from high school ready to enter postsecondary education and a well-paying, flexible career. However, there are many CTE teachers and others in the field who view CTE through a more traditional lens—as vocational courses that lead primarily to the workforce after high school. This tension looms large in discussions regarding California's new CTE content standards and accompanying curriculum framework. Others raise concerns

A variety of CTE programs and courses exist in California

- **Regional Occupational Centers and Programs (ROCPs):** Created in 1967, ROCPs were intended to serve students on a regional basis mostly because of the expensive equipment needed for some programs. Statewide, courses are available today in more than 100 diverse career areas, such as forensic science, engineering, manufacturing, technology, automotive technology, graphic design, digital pre-press, and healthcare. High school students frequently spend part of the school day in a traditional academic program and the other part focusing on a vocation—either in a program offered at their high school, a regional center, or an industry site, such as a hospital or automotive dealer.

By law, ROCPs must offer courses that meet current labor market demand. They work with other local agencies and businesses to design programs accordingly and update course content annually.

During the 2003–04 school year, 74 ROCPs served approximately 336,000 (about 37%) of California's high school students age 16 and older. According to the California Association of Regional Occupational Centers and Programs (CAROCP), enrollment was highest in business/information technology programs and in industrial/technology education. In addition, more than 630 ROCP courses are approved for college credit by community colleges and universities.

- **Career or Partnership Academies:** Academies are school, district, and local industry partnerships that provide integrated academic and CTE instruction to students, at least 50% of whom must be at risk of dropping out of school. The model is a three-year program for students in grades 10–12. These programs focus on a particular career area, such as health or digital arts and media. Students work with the same group of teachers over several years, focusing on both academics and job skills. The goal is to prepare students for college entrance and work success. Corporations or business organizations often sponsor and participate in these academies, which generally are configured as a “school within a school.”

In 2004–05, the state provided a total of \$23 million to support 289 career academies, which served about 2% of high school students. In January 2007, Superintendent of Public Instruction Jack O'Connell announced his intention to sponsor legislation to increase the number of academies to 500. State budget issues may preclude a major new investment in the short term, however.

- **Tech Prep Programs:** These programs also attempt to integrate academic and technical education, but they combine two or more years of high school education with two years of postsecondary education to prepare students for higher-wage employment and/or further education. In 2003–04, 80 Tech Prep consortia of high schools, community colleges, ROCPs, business, and industry were operating in California. The programs are almost exclusively administered by community college districts.

about how CTE fits into the larger context of the high school curriculum. They say that even if the new CTE standards were implemented many classes would still fall short of fulfilling “a-g” expectations.

California is moving from “voc ed” to CTE instruction based on new CTE standards

Throughout most of the 20th century, high school vocational education

programs focused mostly on job skills. The programs were often reserved for students who were either not viewed as “college bound” or who were struggling academically. Consequently, vocational education has had a stigma attached to it. It has been considered less rigorous and of lower quality than traditional academics—a perception that many experts concur was often true. Starting in the early 1990s, however, state and federal

figure 3 | The organizational structure for California's CTE approach includes a multitude of career pathways

A multitude of career pathways are organized into the 15 industry sectors indicated on this table, which are grouped into six general career areas.

Agriculture Education	Business & Marketing Education	Health & Human Services
Agriculture & Natural Resources	Business & Finance	Health Services
Information Technology	Public & Private Education Services*	
Retail & Wholesale Trade	Public Services	
Home Economics & Careers In Technology	Industrial & Technology Education	Arts, Media & Entertainment Technology
Fashion & Interior Design	Building Trades & Construction	Arts, Media & Entertainment Technology
Hospitality, Tourism & Recreation	Energy & Utilities	
Public & Private Education Services*	Engineering & Design	
Manufacturing & Product Development		
Transportation		

* Public and Private Education Services is listed under both Home Economics and Health and Human Services.

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policy-makers' goals for vocational education began to change along with the name.

In 1994 the federal School-to-Work Opportunities Act focused support on the integration of academic and vocational course work. It was viewed as a key high school reform element that might better prepare students for employment in a constantly changing world. The response in California included creation of a variety of CTE initiatives, particularly between 1994 and 1997. (See the box on CTE programs on page 15.) The passage of the Public Schools Accountability Act in 1997 slowed the CTE momentum as policymakers and educators focused on the development and implementation of standards-based reforms.

The state adopts CTE standards and a curriculum framework

Standards-based education, with its emphasis on a high level of academic achievement for all students, pushed the discussion of CTE off the education reform agenda for many

years as California developed and adopted content standards, assessments, and an accountability system that focused on core academic subject areas. In 2002, legislation passed requiring the state to apply its standards approach to CTE by developing content standards and a curriculum framework.

The State Board of Education officially adopted the California Career Technical Education Model Curriculum Standards in May 2005. Developed for grades 7–12, these standards integrate the state's academic content standards with industry-specific knowledge and skills. The expectation is that schools will prepare students for both the workforce and some form of postsecondary education.

Most recently, the SBE officially adopted a new CTE curriculum framework in January 2007. The framework is intended to:

- Guide schools in implementing the standards in relevant and rigorous ways;
- Give examples of best practices;

- Provide information to middle and high school teachers on the relationship between the CTE standards and their academic underpinnings; and
- Outline the relationships schools need to develop with business and community partners to ensure that students can apply academic, CTE, and employability standards in real-world settings and as preparation for postsecondary education.

In its development of the standards and framework, CDE solicited input from multiple groups and entities, including business and industry, community colleges, organized labor, UC, CSU, classroom teachers, school administrators, pupils, parents and guardians, CDE, representatives of the Legislature, and the Labor and Workforce Development Agency.

The framework is organized into six broad career areas that contain 15 industry sectors, each of which has two or more career pathways (see Figure 3). Each pathway includes a sequence of courses that focus on applying academics and developing

technical skills. The state developed standards for each industry sector and each pathway.

California's CTE standards and framework are comprehensive and rigorous

For the state's CTE standards, the key building blocks are the career pathways within each industry sector. Each pathway represents a sequence of academic and technical courses intended to teach students based on state standards and prepare them for more advanced postsecondary work in that specific career area. There are two types of standards for each industry sector: foundation standards that all students need to master and pathway standards that are specific to each career. Each standard includes subcomponents that elaborate on specific knowledge and skills.

The foundation standards cover II areas described as "essential to all students' success." The first two areas—academics and communications—align with the state's academic content standards, but they do not include every standard. Matrices in the standards document detail the extent of this alignment for each industry sector. The other foundation standards include career planning and management; technology; problem solving and critical thinking; health and safety; responsibility and flexibility; ethics and legal responsibilities; leadership and teamwork; technical knowledge and skills; and demonstration and application.

The pathway standards are built on existing Career Technical Education standards, the state's academic content standards where applicable, and appropriate standards established by business and industry. Each career pathway has between three and 12 standards, and each standard has anywhere from two to six subcomponents.

During the standards-development process, there was concern about how fully CTE teachers, particularly those with industry backgrounds, could implement the standards. In some cases, the standards were adjusted

procedural knowledge they have been taught.

For example, a recommended assignment for a certified nursing course includes having students take each other's blood pressure and then write a

A guiding principle behind the Career Technical Education standards-development process was that "students learn through the interaction of declarative and procedural knowledge."

accordingly. The standards therefore align with California's content standards, but they do not encompass or address each one.

A guiding principle behind the CTE standards-development process—based on research in the field—was that "students learn through the interaction of declarative and procedural knowledge." Declarative knowledge provides information (facts, events, concepts, and principles), and procedural knowledge is what the learner is able to do with the information. The interaction between these two types of knowledge gives students the ability to adapt and use information and skills in real-world situations.

California's standards set a high bar for CTE courses and are generally viewed as an international model for rigor and for including academic content. For schools that choose to use them, the expectations should be rigorous and demanding. The curriculum framework, in turn, helps educators develop courses based on the standards. As such, the framework focuses on transferable knowledge that will enable students to change careers more readily because they have mastered the conceptual and academic underpinnings of the

manual about the process. That assignment gives students specific procedural knowledge and also addresses standards in writing, technology, and the application of learned knowledge.

CTE implementation issues are substantial, but opportunities exist

Turning the state's vision for the CTE curriculum into reality in high school classrooms is a long-term challenge. Local schools, districts, and ROCPs have to embrace the vision and develop their capacity to implement it. Policymakers are looking at ways to change a complex system for credentialing CTE to reinforce the evolving expectations for educators, but professional development for current teachers is also essential. Strengthening relationships between community colleges and K–12 might also hold promise.

Implementing the CTE standards is the responsibility of local schools, districts, and ROCPs

The state's adoption of the new CTE standards and framework does not carry any mandates for local high schools and districts. They are not required to offer courses in any of the 15 industry sectors, align their existing courses with the new standards, or

Current Minimum Requirements for Vocational Education Credentials in California

To get a preliminary credential, regular high school teachers generally must have a bachelor's degree, pass a state exam, complete a credential program, and demonstrate subject-matter knowledge as appropriate. They have further educational requirements in order to secure a permanent credential.

In contrast, the minimum requirements for the preliminary vocational education credential in "designated subjects" include:

- (a) Five years or the equivalent of adequate, successful, and recent experience in, or experience and education in, the subject named on the credential.
- (b) Possession of a high school diploma or the passage of an equivalency examination as designated by the commission.
- (c) Completion of two semester units or passage of an examination on the principles and provisions of the U.S. Constitution.
- (d) Passage of an approved examination of basic reading, writing, and mathematics skills.
- (e) If an examination in the subject is necessary or desirable, such an examination may also be required.

The preliminary credential must be renewed within five years. That renewal requires the teacher to have completed two years of successful teaching (or the equivalent), an approved program of personalized preparation, and completion of specified courses in health education.

stop teaching courses in less demanding vocational fields, such as cosmetology. In addition, no standardized, aligned, CTE assessments and no accountability mechanism related to the standards and frameworks exist. As a result, the overall impact of the standards and frameworks depends entirely on how schools and districts implement them.

On the other hand, new CTE programs and changes in some established programs could compel local educators to align their offerings with the standards in order to receive funding. For example, the 2006 renewal of the federal Perkins Act requires that California develop a new state plan for the use of future funds. In December 2006, WestEd prepared a needs assessment as part of that process. In several places its recommendations focus on ways that the CTE Model Curriculum Standards can be used, including a suggestion that they could provide the basis for student

assessments. That approach would be consistent with a standards-based system that holds schools accountable for the results, rather than the implementation, of a particular program.

The current teaching force is not well prepared to teach CTE as it has been newly envisioned

A serious obstacle to creating CTE courses built on the state standards is the limited availability of a CTE teaching force capable of implementing this new vision. One issue is a shortage of CTE teachers, reflecting the fact that CTE programs often compete with industry for teachers and that decreased interest in CTE in recent years has also reduced the supply of candidates. A second issue is the training and current certification requirements for new CTE teachers. Experts also express concern about the professional development needed to help existing high school teachers—whether they work in CTE or

traditional academics—to effectively teach the new brand of CTE courses.

One long-term strategy for strengthening CTE teacher capacity is to leverage the teacher credentialing process to ensure that all newly credentialed teachers can teach to the new CTE standards. However, the current process presents challenges in that regard and is yet another area where policymakers are targeting reforms.

Currently, more than 175 CTE credentials exist. The large number of credentials reflects the state's attempt over time to include all industries and trades in its instructional programs. Schwarzenegger is among those on record saying that the number of specialized credentials has created an overly bureaucratic and complex credentialing process. In 2007, the governor said his administration would sponsor legislation to base the number of credentials on the 15 industry sectors identified in the new CTE standards. The intent is to simplify the credentialing process to improve recruitment efforts, help CTE teachers move more easily across subject areas, and provide districts with more flexibility to hire CTE teachers and expand course offerings.

Another recurrent concern among experts is that the designated subject-credential requirements do not provide enough training for teachers to be able to teach to the new CTE standards. (See the box above for the current minimum requirements.) For example, California does not require holders of these special subject and vocational credentials to pass the California Basic Educational Skills Test (CBEST) unless the credential also requires a bachelor's degree.

Team teaching may build capacity of current high school teachers

Many observers express concern that the effort to integrate academic and CTE knowledge and skills in a

classroom cannot succeed if teachers do not know how to combine those two areas. Historically, in teacher preparation programs, academic teachers do not learn how to teach in an applied way, nor do CTE teachers learn how to teach the academic core of a technical area. For example, a construction teacher can do the trigonometry required to figure out a roof angle, but she might not be able explain the mathematics behind the calculations. The mathematics teacher can explain the concepts, but he often cannot apply it to building a bridge or apartment building.

One suggestion is that these teachers could provide a stronger curriculum to students—and one consistent with the CTE standards—by using a team-teaching approach. A practical obstacle to this, however, is the common divide within traditional high schools between their academic and CTE faculty. When CTE courses are offered in separate ROCPs, that division can be even more pronounced.

For California high schools to move successfully into this new approach to CTE, the instructional capacity issues must be seriously addressed. That will likely require technical and academic teachers to collaborate in new ways, a process that could be facilitated both through effective professional development and increased awareness of existing model programs. The availability of resources—in terms of funding, time, and expertise—could be a central ingredient to making such capacity building possible.

California's community colleges could be strong partners in local Career Tech Education efforts

California's community colleges play a central role in preparing students for the workplace. They could be more effective, however, in assisting with the

development and implementation of CTE-related programs and policies in the state's high schools. For example, they could do a better job of signaling to high schools the knowledge and skills necessary for students to be able to succeed in course work or degree

also common. In addition, various groups are exploring different models that integrate academic and CTE curricula and connect K–12 with community colleges.

An example is the Early College High Schools model. Promoted by the

California's standards set a high bar for Career Technical Education courses and are generally viewed as an international model for rigor and for including academic content.

programs that lead to particular careers. Some local and regional CTE collaborations between high schools and community colleges exist now, ranging from formalized relationships at ROCPs to more informal course- or pathway-related activities. But this is not done systematically throughout the state or within all the CTE areas where it would be valuable.

Historically, community colleges have had minimal involvement in statewide K–12 reforms, and this was true for the development of the new CTE standards. Policymakers have tried to improve this situation in recent years. For example, a new Economic Development and Career Technical Education Reform Initiative, passed in 2005 (Senate Bill 70), provides funds for “Quick Start” Partnerships in part to strengthen CTE linkages and pathways between high schools and community colleges.

K–12 and community college partnerships break down barriers between the two systems and offer alternatives to students

Throughout California, dual-enrollment programs—in which high school students take college-level course work during high school—are

Foundation for California Community Colleges in partnership with CDE and the California Community Colleges Chancellor's Office (CCCCO), these programs blend high school and college so that students can complete two years of college while in high school. The programs provide support services for students in the middle school and early high school years to ensure that all students in the program will be ready for college-level work. The efforts focus on students who are traditionally underrepresented in postsecondary education.

The CCCCCO also runs 13 Middle College High Schools (MCHS) that serve approximately 2,000 students. These programs focus on providing traditionally underrepresented “high-potential” students with a quality high school education and access to community college courses and services. High school students attend classes on a community college campus, earn credit toward a high school diploma, and have an opportunity to take college courses and to receive academic counseling. The programs leverage greater use of CTE resources, including laboratories and equipment.

figure 4 | Comparison of High School Graduation Requirements, CTE Recommendations, and UC/CSU “a-g” Requirements

Subject Area	State High School Graduation Requirements*	Recommended Career Technical Education	UC/CSU “a-g” Subject Area Requirements
History/Social Science	3 years Including U.S. history & geography, world history/culture/geography, American gov't/economics**	3 years Including U.S. history & geography, world history/culture/geography, American gov't/economics**	2 years 1 yr world history/cultures/ geography, plus 1 yr U.S. history/gov't
English	3 years	4 years	4 years College preparatory English
Mathematics	2 years Including algebra	2–3 years At least algebra & geometry; intermediate algebra for many paths	3 years Algebra, geometry, intermediate algebra
Laboratory Science	2 years Including physical and biological sciences	2–4 years Specific courses depend on CTE area of focus	2 years From biology, chemistry, and physics
Foreign Language	1 year Either foreign language <i>or</i> visual and performing arts	2 years	2 years Same language
Visual and Performing Arts	1 year Either foreign language <i>or</i> visual and performing arts	1 year	1 year
Electives: General	1/2 year Health***	0 years	1 year
Electives: Career Technical	0 years	2–4 years Specific requirements depend on CTE focus area	0 years
Physical Education	2 years	2 years	0 years
SUBTOTAL	13.5 courses (units)	18–23 courses (units)	15 courses (units)
Remaining Electives	8.5 courses (units)	0–4 courses (units)	7 courses (units)
TOTAL REQUIRED FOR GRADUATION	22 courses (units) (220 credits)	22 courses (units) (220 credits)	22 courses (units) (220 credits)

* The governing board of any school district may require additional course work for graduation.

** UC accepts economics in the elective area, rather than the history/social science area.

*** The State Education Code does not require a semester course but rather a list of topics that can generally be accomplished in less than a semester.

DATA: CALIFORNIA DEPARTMENT OF EDUCATION (CDE)

EDSOURCE 5/07

These partnerships with community colleges are generally discrete programs offered to a few students. However, UC has recently paid more attention to what is needed to certify CTE courses as fulfilling the “a-g” requirements, an action that could have a more universal impact on the curricula in California high schools.

UC course approvals are a linchpin in the effort to unite academics with Career Tech Education

In an acknowledgement of the substantial rigor incorporated in some CTE courses, UC began two decades ago to approve CTE programs and courses that meet its course criteria. Senate Bill 813 (The Educational Reform Act of 1983) set the stage for

this. The bill mandated specific high school graduation requirements in English, history, science, mathematics, fine arts/or foreign language, and physical education, but CTE courses were not part of the requirements. However, the Legislature also stipulated that local education agencies were to provide alternative methods for students to meet mandated

graduation requirements, including “practical demonstration of skills and competencies, supervised work experience or other outside school experience, interdisciplinary study, independent study, and credit earned at a postsecondary institution.”

This provision enabled CTE educators to design integrated courses that could meet graduation requirements in many of these mandated academic areas—and also meet UC expectations. Although the record is not entirely clear, the first known CTE courses to meet UC admission requirements came from two agriculture programs located in the San Joaquin Valley in the mid-1980s.

In 2003, the Superintendent of Public Instruction Jack O’Connell began actively encouraging CTE educators to develop rigorous, standards-based CTE courses that could meet UC admission requirements. Since then, UC has approved an increasing number of CTE courses.

Even with this increased emphasis, however, fewer than 20% of CTE courses meet the “a-g” requirements, according to an analysis completed by UCOP in 2005–06. This analysis grouped CTE courses into six broad categories (agriculture, business, health careers, home economics careers/technology, industrial and technology education, arts and entertainment, and other career-technical industry sectors) and then reported which of the “a-g” subject-matter areas they fit. Most notably, there are very few approved courses in history/social science (21), English (19), mathematics (5), or languages other than English (2). The bulk of the CTE approved courses are in laboratory sciences (684), visual and performing arts (2,107), and college preparatory electives (1,183). Almost 10% of the 914 high schools that UCOP reviewed did not have any “a-g” approved CTE courses.

These numbers indicate how many courses in each area are approved, not how many are offered throughout the state. Once a course receives approval for one high school, it can be offered by others. So although only five math CTE

Recognizing this need to go beyond the “a-g” courses, the analysis discusses opportunities for students to take more than six courses per year through the use of more flexible school bell schedules and/or taking summer school and

UC has recently paid more attention to what is needed to certify CTE courses as fulfilling the “a-g” requirements, an action that could have a more universal impact on the curricula in California high schools.

courses have been approved, more than five classrooms/high schools likely offer the courses. There is some agreement that a greater number of CTE courses could be submitted to UC and approved. Yet, there is also some agreement that it is neither appropriate nor desirable for all CTE courses to seek “a-g” approval.

UCOP also examined the differences and compatibility between the minimum course-taking requirements for high school graduation, recommended CTE courses of study in high school, and the “a-g” requirements (see Figure 4). For the CTE courses, UCOP referenced specific course sequences recommended by CDE. In many schools, students complete CTE programs with many fewer courses.

UC concludes its analysis by stating that “it is manageable for a student to meet all three sets of requirements (high school graduation, CTE recommendations, UC/CSU eligibility) while completing the minimum number of units for high school graduation (22 units/220 credits).” This conclusion is based on the fact that students need to take 15 approved courses to be eligible for UC admission. However, as noted earlier, in order to be competitive at most UC campuses, students generally complete more than 15 “a-g” courses.

community college classes. Ultimately, it concludes that when “students take full advantage of extended opportunities to complete coursework, it is possible for a student to take enough college preparatory coursework to be competitively eligible for the most selective UC campuses, while simultaneously completing recommended CTE coursework.” Within this context, the UCOP analysis demonstrates that the task is more manageable when students have an opportunity to complete “a-g” approved CTE courses. However, when students attend high schools that do not offer enough “a-g” courses, have few or no “a-g” approved CTE courses, and/or are operating on a traditional six-period day schedule, they may face barriers to meeting these mutual goals.

The situation with CSU is somewhat different, in part because of fundamental differences between the goals of UC and CSU that are often lost in the larger discussion. Although both systems have the same course-taking requirements, they have a very different overall focus. In addition, it takes fewer “a-g” courses to be competitive for admission into the majority of CSU campuses. That means there could likely

be more opportunity for a student entering CSU to complete both the minimum required “a-g” courses and a CTE pathway. Given that the CSU system is also more oriented to a professional education—in contrast to UC, which is a research-based university system—the match between

Others on the “CTE side” believe that the high school curriculum needs to include more options for high school students who intend to pursue further education but also wish to gain career skills and better understand the connection between learning and earning. They are often concerned that

strongly advocate a departure from that organization of high school courses and students. Reformers say that the traditional system generally has been ineffective and particularly unfair and damaging to low-income, African American, and Latino students. Many point to the general education track, in particular, as not preparing students well for life after high school, regardless of their aspirations. Students who have not completed the “a-g” sequence or a CTE program are arguably not prepared for much of anything, and that group represents a substantial portion of today’s high school graduates.

Most multiple pathway advocates reject the notion that instruction should be organized with college-bound students on a separate path from those who either are not likely to go on to college or who school officials label as unable to do so. As a paper by Jobs for the Future states, “Multiple pathways do not imply multiple standards—but rather clear standards at various levels and many ways of moving toward the standards.”

The tensions between traditional academic and CTE curricular approaches in high schools are historic and run deep....Recent debates have pitted “a-g for all” advocates against CTE supporters.

students interested in CTE and those interested in a CSU education holds particular promise.

Multiple pathways approach tries to circumvent “dual and dueling” views of high school curriculum

The tensions between traditional academic and CTE curricular approaches in high schools are historic and run deep. Based partly on the historical structuring of the comprehensive high school into separate tracks, some experts characterize the high school curriculum as dual systems that are constantly dueling over how high schools ought to be teaching students. Recent debates in California that have pitted the “a-g for all” advocates against CTE supporters illustrate the point.

Many people on the “academic side” claim that far too often low-level, occupation-specific CTE has been the “dumping ground” for Latino, African American, and low-income students. It has removed them from the college preparatory curriculum and curtailed their postsecondary opportunities. They want policies that ensure that all students have access to rigorous academic course work.

the current standards movement and the push for schools to meet accountability targets—combined with the emphasis on preparing more students for university admission—is forcing CTE courses out of middle and high schools. One consequence is that school is less engaging for students.

Nationally, and in California, there is increasing interest in refocusing this “dual and dueling” discussion by promoting a vision for how high schools can provide curricula that are engaging, rigorous, and prepare students both for postsecondary education and for a career after high school. That vision is often referred to as multiple pathways. One challenge, however, is that the term itself is not universally recognized and can also be defined many different ways.

For example, it might initially appear that the traditional high school already offers multiple pathways by having separate course sequences that lead to postsecondary preparation and to workforce preparation, as well as the general education sequence for students who are unsure about their goals.

However, current reform movements that focus on multiple pathways

Do multiple pathways provide a new vision for California’s high school curricula?

In California, support for connecting CTE and postsecondary preparation is gaining momentum, including some notable new initiatives. ConnectEd: The California Center for College and Career is a nonprofit effort recently formed to “support the demonstration, expansion, and replication of promising practices and programs that prepare students for success in college and career.” This new organization is working to expand the number of multiple pathway options for California high school students.

In support of this work, UCLA’s Institute for Democracy, Education, and Access (IDEA) recently released a set of papers entitled “Multiple

Perspectives on Multiple Pathways: Preparing California's Youth for College, Career, and Civic Responsibility." The authors concluded that courses that combine CTE and academic curricula have the potential to reform California's high schools in ways that will benefit the state's diverse student body. IDEA is a network of UCLA scholars and students, professionals in schools and public agencies, advocates, community activists, and urban youth whose mission is to make high-quality public schooling and successful college participation routine occurrences in low-income neighborhoods of color.

The current multiple pathways movement in California—as defined by ConnectEd and IDEA—calls for every curricular pathway to have three essential components:

1) a college-preparatory academic core (satisfying the “a-g” course requirements for entry into California's public universities);

2) a professional/technical core well grounded in academic and real-world standards; and

3) increasingly more demanding opportunities for field-based learning that deepen students' understanding of academic and technical knowledge through application in authentic situations.

Each pathway also provides students with support services, such as supplemental instruction, counseling, and transportation. Although the structural components may vary, the goal is the same: all pathways prepare students to succeed in college and career, not one or the other.

IDEA acknowledges that the multiple pathways vision “seeks to change a century-old tradition that continues to make sense to most people” and that the shift would be difficult to achieve. The authors are also emphatic, however, that such a shift is necessary

if all students are to have real opportunities in today's society—simply reorganizing the high school structure will not be sufficient for California schools to achieve that goal. The report makes several policy recommendations, including the convening of a joint K–12/postsecondary education planning committee; analyzing cost and feasibility issues; and investing in curriculum development and teacher professional development.

Developing teachers' skills might represent the most difficult challenge, and it is a significant focus for ConnectEd. Its major activities involve developing illustrative examples of what successful multiple pathways look like and working to build a network of schools throughout California that is dedicated to strengthening and expanding multiple pathways.

At the classroom level, high-quality CTE includes the integration of academic and CTE curricula; adherence to high industry-driven standards; opportunities for interest-driven, hands-on, and applied learning; the integration of career exploration and experiences in the workplace; and the teaching of higher-order thinking.

ConnectEd has as a central goal the increased visibility of effective programs already in existence throughout the country and support for their replication. In many cases, the programs have staff and resources dedicated to helping local educators who wish to move in this direction. (The box on page 24 describes several model programs that exemplify the multiple pathways approach and that ConnectEd staff see as effective.)

California's network of Partnership Academies also includes many examples of effective programs. A March 2007 profile of California's Partnership Academies highlights



DEFINING COMMONLY USED TERMS

What are multiple pathways?

Advocates of high school reform continue to grapple with this term as they use it to define their various approaches to the high school curriculum.

Most advocates agree on the goal: provide all students with access to a rigorous core curriculum and help them achieve high standards while also allowing for enough choice and flexibility within the high school curriculum to meet students' diverse interests and post-graduation goals. Student engagement is key. The goal is to make sure all students develop skills and knowledge such that they will have many options when they graduate from high school and later in their lives and careers.

The term “multiple pathways” also refers to specific models for reforming the way academic and career technical content are taught in high schools and the extent to which the two are integrated into students' educational and life experiences. Those models differ in significant ways and also challenge areas of the traditional curriculum, which can evoke strong feelings among advocates.

Some advocates use multiple pathways to explicitly refer to various high school course sequences that emphasize a career focus (e.g., health, construction, engineering) and that blend CTE and “a-g” requirements.

What is postsecondary education?

The term includes any of the various educational options open to students after the completion of high school, including certification programs for specific trades or industries, additional academic course work, a two-year associate's degree, a four-year bachelor's degree, and so on.

What is meant by entering the workforce?

Educators and advocates use this phrase to refer to entry into a career that offers advancement and will eventually pay enough to support a family of four.

Model CTE Programs

Arthur A. Benjamin Health Professions High School, Sacramento City Unified School District (<http://schools.scusd.edu/healthprofessions>)

Health Professions High School, which began accepting freshmen in September 2005, is one of Sacramento City Unified School District's "small, focused high schools." The high school was conceived in part to address a shortage of new, qualified health care workers in the Sacramento area. It is aimed at students who want to investigate careers in medicine or veterinary medicine.

Each year the school enrolls about 180 freshmen who participate in an academically rigorous curriculum focused on science. Using an Early College model, students begin college work in high school and participate in leadership training and workplace learning with health care partners. The school is open to students within the district or in other Sacramento-area school districts.

Students are expected to at least complete calculus by the time they graduate. Besides the more traditional biology, chemistry, and physics courses, students must also take health and biomedical science for four years as well as courses on nutrition, microbiology, and anatomy and physiology. The school emphasizes hands-on learning and works to place students in job shadowing opportunities and then internships in a health care field that interests them. During their junior and senior years, students participate in such internships or take a college or Regional Occupational Program (ROP) course in their area of interest. Seniors must also study research methodologies and complete a senior project.

Students learn "in an extremely supportive environment that blends positive relationships with adults, a solid academic foundation, and community-centered learning," according to Principal Matt Perry.

Project Lead the Way (www.pltw.org)

A not-for-profit organization with programs in high schools and middle schools in California and across the nation, Project Lead the Way (PLTW) introduces students to the scope, rigor, and discipline of engineering and engineering technology. The overall purpose of PLTW is to make math and science relevant to students by emphasizing hands-on, real-world projects. Students synthesize knowledge and learn how to resolve problems within the context of a particular subject, thereby helping them to make connections and see the value in what they are learning.

The high school program—which includes a four-year sequence of courses—was also created to attract more students to engineering and help them determine if it is a career they would like to pursue. According

to PLTW, students who participate in the program are more likely to be successful in college engineering courses, thus reducing the attrition rate, "which currently exceeds 50% nationally." In addition, a specific goal of the 40-week middle school program is to attract girls and minority students to technology and related career fields.

Students either improve existing products or invent new ones, with an emphasis on analyzing potential solutions and communicating ideas to others. Working cooperatively as a class or in small groups, students focus on one project over an extended period of time, with activities geared to an increasing level of complexity.

A key component of the PLTW program is teacher education because the curriculum requires teachers to use cutting-edge technology and software that require specialized and ongoing training.

Ford Partnership for Advanced Studies (www.fordpas.org)

The Ford Partnership for Advanced Studies (Ford PAS) is an academically rigorous, interdisciplinary curriculum and program that provides students with the content knowledge and skills necessary for future success in areas such as business, economics, engineering, and technology. The Ford Motor Company Fund and Education Development Center Inc. (EDC) created the inquiry- and project-based program, which offers five semester-long elective courses that link learning in traditional academic subjects with realistic applications. These links are forged through communitywide, cooperative efforts and innovative partnerships that join local high schools, colleges and universities, and businesses.

The learning modules within the courses are designed so that skills and content knowledge develop as students move from one module to the next, and the realistic applications prepare students for the challenges they will face in postsecondary education and the workplace. For example, in a semester-long course, Planning for Business Success, students become managers of a fictitious local band trying to break into the national music scene. Through case studies and computer simulations, they learn about marketing and finance. They also debate ethical issues involved in marketing. Eventually, they create a business plan that they then pitch to potential "investors" from the community.

In addition to the semester-long courses, Ford PAS offers five modules that can be used independently as units in existing courses in economics, engineering, physics, statistics, and U.S. history.

Ford PAS also assists teachers through online courses and forums, professional development institutes, technical assistance, and conferences that provide networking opportunities.

some substantial successes for these programs and documents their overall success in having students eligible for university admission when they graduate. Published by ConnectEd and the Career Academy Support Network (CASN), the profile says that these programs “offer some of the most promising strategies for delivering multiple pathways to both postsecondary education and career—for at-risk students, as well as a cross-section of all students.”

Currently, almost all the evidence about this approach comes from programs like these, which involve self-selected students and teachers. Little rigorous evaluation exists about whether this approach, if it were implemented statewide, would lead to increased high school graduation, a greater proportion of students being ready for and completing some form of postsecondary education, and increased workforce preparation. There is a great deal of hope, however, that done well, this way of teaching and learning offers an alternative that could improve academic and career opportunities for a large proportion of students. Further, it is one way to integrate all three of the curriculum approaches or levers mentioned in this report—standards, “a-g” requirements, and CTE—and to encourage more alternatives for students.

Obstacles and opportunities exist for strengthening California’s high school curriculum

Regardless of the means, the end goals of California’s current high school reform efforts converge in many places. There is widespread agreement that the state’s public education system needs to:

- Increase high school completion rates;
- Offer curricula and instruction that engages students in learning;

- Improve students’ academic achievement;
- Narrow current achievement gaps among ethnic groups of students; and
- Increase the number and percent of students—particularly of traditionally underrepresented students—

The state’s academic content standards, for example, have established a rigorous set of expectations for what students need to know and be able to do. A crucial issue in the implementation of standards remains the capacity of districts, schools, and teachers to align their curriculum

Students who have not completed the “a-g” sequence or a CTE program are arguably not prepared for much of anything, and that group represents a substantial portion of today’s high school graduates.

who are well prepared for postsecondary education and work after high school.

The curriculum offered in California high schools—and the quality with which it is taught—is an important lever for achieving all these goals. As this report has summarized, the state currently has three powerful levers for strengthening that curriculum—its 9–12 academic content standards; university (UC and CSU) eligibility requirements and postsecondary placement standards (UC, CSU, and community college); and reforms of Career Technical Education.

These three mechanisms are not particularly well coordinated and depend heavily on the abilities of local educators for their effective implementation. It seems clear that none of them can be used in isolation to meet the needs of every California student or create positive change in every high school. The demands and the challenges are too varied and complex. Each leverage point for improving the curriculum, however, contributes to the whole and has a place in the state’s emerging discussion of the high school curriculum.

with these demanding expectations and ensure that the curriculum is engaging for students. Educators need high-quality professional development and sustained support to do so. Equally potent is the question of what incentives they have to do that hard work and what tools they have for motivating students—particularly those students who struggle the most academically or who have the least sense of why school achievement matters.

Aside from getting a high school diploma, one of the most salient incentives for students is going to college. Students and parents are clear that people with college degrees are more successful economically, and the demand for college preparation and access has grown. For the most recent discussions of the high school curriculum in California, college preparation has generally been translated into completing the “a-g” course requirements, in part because that provides some clarity and focus. In reality, that has obscured what it means to prepare for postsecondary institutions other than UC or CSU and has not always provided the appropriate information for UC or

California institutes a new counseling program

The most recent data (from 2004–05) show that the state’s ratio of K–12 students to counselors is about 1,000-to-1—twice the national average. In 2006–07, California’s Legislature appropriated \$200 million for an ongoing program to increase the number of counselors serving students in grades 7–12. The stated goal of the legislation is to bring the student-counselor ratio down to 500-to-1 in grades 7–8 and 300-to-1 in grades 9–12. It is estimated that the \$200 million translates to about \$71 per student.

Schools must spend this money to provide counseling services by people who hold a valid pupil personnel services credential. This credential is an umbrella for four specializations: counseling, social work, psychology, and child welfare and attendance services. In addition to more detailed requirements regarding meeting with and providing information to students and their parents, districts must also submit an annual report on their counseling activities to the California Department of Education.

College counseling is one of a set of conditions consistent with the development of a college culture in high schools. Traditionally, counselors have been responsible for providing students with the necessary information and resources to prepare for college. Students need early and high-quality information about postsecondary preparation, choices, and financial aid. This need is particularly acute for students who have no relatives, siblings, or peers who attended college and thus must rely on someone at the school site to provide that information. And for all students, counselors have the potential to provide more specific, accurate, and up-to-date information than can noneducators or teachers.

An issue not specifically addressed in California’s program is that counselors today have so many responsibilities that college counseling is often neglected. Over the past 30 years, counselors’ professional responsibilities have evolved and multiplied. The three main tasks of counselors today are scheduling, disciplining, and monitoring students who might drop out. After diffusing day-to-day crises, administering tests, and completing other tasks, counselors may have limited time for college advising. However, this infusion of counseling resources might also prompt new approaches in high schools that are under pressure to improve their students’ prospects after graduation.

CSU readiness either. Data also show that students from historically disadvantaged groups are less likely to even complete the course work needed for admission to four-year universities.

There has been a great deal of debate in California about mandating that all high school students complete the “a-g” sequence. But the issues and opportunities are more nuanced than the dualistic view that students must take the “a-g” course sequence or they will not get a rigorous high school education. The “a-g” requirements do not take the place of California’s academic content standards. They do

not constitute a curriculum per se, there is minimal quality control, and they do not necessarily result in student readiness for college-level course work. Strong indications exist that the current processes for course approval and monitoring by themselves do not and cannot ensure that the “a-g” courses provide the academic rigor and effective instruction that students need. Again, local high school educators are the critical component in determining whether that happens.

Increasing the percentage of currently underrepresented students

who attend and succeed in UC and CSU institutions is important to California’s future. However, the admission of every California high school graduate into a four-year university simply cannot happen. The capacity of California’s public universities makes it unlikely that attendance can grow much beyond the current levels, and not every young person wants to pursue a bachelor’s degree. Those realities reinforce the need to broaden students’, parents’, and educators’ visions and understanding regarding what it takes to succeed in other postsecondary settings, such as community colleges and the workplace. Central to this are support services and adult-student relationships that enable all students to get the help and guidance they need to think and plan beyond their high school years. A key issue is making sure that students’ aspirations are not diminished by adult perceptions or expectations of them—an issue that state policy cannot impact very much.

In 2006, state policymakers addressed one facet of this issue by earmarking \$200 million to encourage school districts to increase the number of counselors in middle and high schools. For a number of years, California has ranked at the bottom among the states in the ratio of guidance counselors to students, and the new program’s goal is to raise the ratio to the national average. This goal is consistent with expert opinion that adequate counseling services help create a “college culture” in high schools. (See the box above for more on this program.)

The state also needs to consider its obligation to the approximately 30% of students who do not complete high school on time. Improving the curriculum so they can understand how learning is relevant

to their lives—and their potential for adult success—might be a crucial part of the solution. Many surveys of student opinion echo the findings of the 2006 High School Survey of Student Engagement, which reported that a large portion of students is disengaged from school, in part because the class work seems uninteresting or irrelevant.

For these reasons, CTE has resonance—but its rigor needs to match its relevance. State standards are a promising first step for pulling this portion of the high school curriculum into the 21st century in terms of academic expectations. Central to that is the ongoing work toward a curriculum that serves students better by emphasizing not only job skills, but also the underlying knowledge that helps ensure long-term success. Educator capacity is a huge issue here as well.

Multiple pathways is one proposal for how high schools in California can restructure their curricula in a way that taps into all these approaches. The philosophy is to redefine the conversation away from students either preparing for college or for work. Instead, the high school curriculum would incorporate high academic standards and applied learning, preparing students for adult success regardless of the path they choose.

This report identifies several important leverage points that can improve the high school curriculum so more students finish high school prepared to take on challenging postsecondary options. These include:

- Improving instruction and content to align with the state’s academic

guidance they need to take challenging courses and to understand their postsecondary options and how to reach them.

California needs all these levers in place if it is to strengthen the high school curriculum. A key seems to be to use them in concert

No single approach to the high school curriculum provides the answer for every student, and no one set of reforms will be best in every situation.

standards so that more students are mastering them at higher levels;

- Strengthening teacher and principal professional development and aligning it to the specific demands of standards-based instruction in California;
- Improving access to and quality of “a-g” course work across high schools;
- Increasing the availability of high-quality CTE courses and pathways that are academically robust and that provide engaging hands-on experiences; and
- Providing students with the support, encouragement, and

instead of seeing them as being opposites. No single approach to the high school curriculum provides the answer for every student, and no one set of reforms will be best in every situation. There are many curricular options that combine rigor and relevance, and many ways to organize high schools so students have stronger relationships with caring, skilled adults. Perhaps accepting the need for multiple strategies is the most important step California can take to strengthen its high school curriculum and improve all its students’ chances for adult success. ■■

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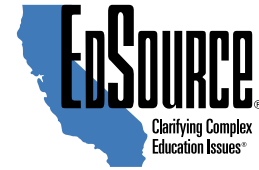
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