

Multiple Pathways to Success: PREPARING HIGH SCHOOL STUDENTS FOR COLLEGE AND CAREER

SUBMITTED BY:

Gary Hoachlander, President
Roman J. Stearns, Director for Policy Analysis and Development

CONTACT INFORMATION:

**CONNECTED: THE CALIFORNIA CENTER FOR COLLEGE
AND CAREER**
2150 Shattuck Avenue, Suite 1200
Berkeley, CA 94704
Phone (510) 849-4945
Fax (510) 841-1076
Ghoachlander@ConnectEdCalifornia.org
RStearns@ConnectEdCalifornia.org

TOPICS COVERED:

Personnel and leadership, School finance and governance,
State data systems

PROBLEM STATEMENT

California's high schools are not succeeding in preparing large numbers of young people for lasting success in further education, careers, and the civic affairs of the state. The evidence is increasingly compelling not only to educators, but also to policymakers and the public. In 2006, California graduated only 67 percent of students who started 9th grade four years earlier.¹ In 2005, adults without a high school diploma earned an average of about \$19,000—or approximately \$10,000 less than what graduates earned.² Not surprisingly, high school dropouts are more likely to be non-voters, on welfare, and in the criminal justice system.³ In California, the 2006 dropouts may cost the state more than \$36 billion in lost wages, taxes, and productivity over their lifetime.⁴

Dropouts are not the only ones who are struggling. Of the two-thirds of students who graduate from high school, only half enroll directly in college upon high school graduation—and just over half of those then receive a degree within 150 percent of the time estimated to earn it (three years for an associate's degree or six years for a bachelor's degree).⁵ Many enrolling in college also find that they are underprepared. Placement test results show that they must complete remedial coursework before starting credit-bearing college-level classes.

To compound matters, many predict that more jobs will *require* some postsecondary education in the future. Employers prefer to hire more highly educated workers and given growth in the number of college-educated candidates worldwide, they are in a good position to insist on this credential. A recent survey of 431 human resources officers reported that, over the next five years, 28 percent of employers intend to hire fewer entry-level workers holding only a high school diploma. Almost 50 percent of employers expect to hire more two-year college graduates, 60 percent to hire more college graduates, and 42 percent to hire more postgraduates.⁶ Employers want to hire college graduates because high school graduates often have not yet learned “soft skills,” such as teamwork, problem solving, critical thinking, and effective communication.⁷ In fact, 70 percent of surveyed employers find the applied skills of new high school graduates to be deficient.⁸

Why are high schools ineffective in keeping students engaged in school and fully preparing them for postsecondary and employment options? Many point to the curriculum, which lacks both rigor and relevance in many high schools. Students need not only rigorous material to stay engaged, but also an understanding of why the material is relevant to the real world. Without these factors, they feel unchallenged and disengaged because they do not understand why they need to learn abstract principles outlined in textbooks. In a survey of 10,000 students ages 16–18 (which includes those currently or formerly enrolled), students confirmed their high school courses' lack of rigor with approximately one-third saying high school has been easy.

Two-thirds said they would work harder if high school offered more demanding and interesting courses.⁹ They also stated the need for a curriculum connected to the real world. Approximately 60 percent agreed that taking courses that

matter later in life, receiving practical information on college, and taking courses that count for college credit would make the senior year more meaningful.¹⁰ In a separate survey and interviews with 467 dropouts, 81 percent reported that more opportunities for experience-based, career-related learning would have made the connection between getting an education and getting a good job more transparent to them. The top reason they identified for dropping out was that classes were not interesting.¹¹

Clearly, it is time for a change. A new approach for improving high schools and corresponding policy changes to support it are needed.

DISCUSSION OF POLICY ISSUES, OPTIONS, AND RECOMMENDATIONS

Across the state, there is growing agreement that the development and expansion of “multiple pathways” is a promising strategy for improving student achievement in high schools. A “pathway” is a multi-year program of academic and technical study organized around a broad industry theme that prepares high school students for a full range of postsecondary options. “Multiple pathways” give students access to a variety of industry-themed programs of study in such fields as business and finance, biomedical and health science, building and environmental design, engineering, and arts, media, and entertainment, to name just a few. These pathways share four key components:

1. **Rigorous academic core:** all students take the academic courses meeting entrance requirements for four-year universities in California and other states, as well as reducing the need for remediation in community colleges, apprenticeship programs, and other postsecondary options. These academic courses focus on an industry sector to show students the relevance of what they are learning and integrate academic lessons with technical courses to help students understand how abstract concepts and real-world scenarios are related.
2. **Technical core:** all students take a cluster or sequence of technical courses focused on the same industry sector as their academic courses. Lessons incorporate academic principles to show students how concepts are applied.
3. **Work-based learning:** students participate in learning activities outside the classroom that connect coursework to real-world applications. Students might start with job shadowing and mentoring in 9th grade and progress to an internship or a school-based enterprise in 12th grade.
4. **Support services:** students have access to academic support services that help them succeed in a demanding program of study, as well as career counseling services that help them map out how to meet self-defined secondary and postsecondary goals.

Multiple pathways can take many different forms, such as career academies, themed small schools, and others. Whatever the particular features of each pathway, however, they all share some central guiding principles.

1. By design, **pathways prepare students for both postsecondary education *and* careers**, not just one or the other. If there ever was a time when high schools could be content to prepare some students just for college and others just for work, that day is past. The probability of making a living wage in today’s economy (let alone the economy of tomorrow) without some form of postsecondary education is low and continuing to diminish. Increasingly, career success depends on postsecondary education and completion of a formal credential—certificate, associate’s degree, bachelor’s degree, or higher.
2. **Pathways integrate challenging academics with demanding career and technical curriculum** to help students better understand how academic concepts apply in the real world. Pathways alter *how* core academic subjects are taught; they do not lower expectations about *what* is taught. Pathways expect students to achieve to high levels in mathematics, science, English, social studies, and foreign language, and they promote mastery

through the power of real-world application to authentic problems and situations that are part of the modern workplace.

3. **Pathways prepare students for the full range of postsecondary opportunities**—two- and four-year college, apprenticeship, the military, and formal employment training. The broad industry focus of each pathway provides a framework that can appeal to any student, regardless of postsecondary aspirations or prior academic achievement. Pathways, well designed and implemented, eliminate sorting and tracking high school students in ways that limit options after high school.
4. **Pathways produce** high levels of academic and technical achievement, high school completion, postsecondary transition, and attainment of a formal postsecondary credential. They also contribute—in ways that most conventional academic and CTE curriculum do not—to students’ becoming more proficient in critical thinking, problem solving, media and information literacy, and collaboration. Finally, pathways contribute directly to higher earnings immediately after high school by giving students a leg up in the labor market while they pursue postsecondary education.

Currently, comprehensive pathways are available to only about five percent of California high school students through various school and program designs. Changes to state policy can help expand this approach to more schools so that more students can gain access to it. While policy changes in curriculum and instruction, student support services, and postsecondary articulation and other areas would facilitate implementation of this approach, this paper focuses on policies related to personnel and leadership, school finance and governance, and state data systems.

Personnel and Leadership

Building a cadre of teachers who understand the benefits of integrating academic and technical curriculum and have mastered the instructional approaches needed to do so is critical to the implementation of a multiple pathways approach. While technical teachers often have more experience in project-based learning, they often lack expertise in identifying, reinforcing, and supplementing key academic concepts in particular disciplines. Academic teachers, while proficient in a particular discipline, often have limited knowledge of technical fields and in helping students apply academic content to practical industry problems. And both academic and technical teachers have little training in how to integrate academics and technical content. Teacher preparation programs, and the Commission on Teacher Credentialing (CTC) standards that regulate them, need to be modified to promote better preparation of teachers, academic and technical, who can successfully deliver pathways that integrate challenging academic content with demanding technical knowledge and skill.

Both new and veteran teachers—through teacher preparation and professional development programs, respectively—should receive guidance in teaching in a multiple pathways program. Elements might include curriculum integration, joint planning, project- or problem-based learning, work-based learning, authentic assessment, and other essential aspects of instructional practice directly related to effective delivery of pathway programs. Team teaching also can help bridge the gap between the training and experiences of academic and technical teachers. For example, automotive technology and physics teachers could team teach to help students understand the physics embedded in the technology of the modern automobile including propulsion systems, fuel efficiency, deceleration and braking, ergonomics, safety, and environmental protection.

In addition to teachers, pathways make additional demands of school guidance counselors. Specifically, they need to be able (and have time) to guide students in exploring career options and mapping the education, training, and work-related experiences that will help them achieve their career aspirations and goals.

Finally, school principals, superintendents, and state leaders must be able to articulate the vision of multiple pathways and manage the development and continuous improvement of a system of pathway options for California high school students.

Policy Recommendations:

- Invest in professional development that helps academic and career and technical teachers share expertise to develop integrated curriculum and improved instructional approaches.
- Evaluate the need to, and, as appropriate, modify teacher preparation programs to incorporate appropriate strategies for integrating academic and technical curriculum, incorporating project- and problem-based learning, and connecting classroom instruction to structured work-based learning opportunities.
- Invest in increasing the supply of counselors, particularly in high-poverty schools, and, through training, increase the capacity of counselors to help students explore the full range of postsecondary and career options with an eye toward long-term career planning.
- Provide administrators with professional development on managing change, securing resources, engaging industry and community partners, using flexible scheduling options, understanding legal responsibilities related to work-based learning, recruiting uniquely qualified teachers, and understanding and advocating for teacher and counselor professional development needs.

Finance and Governance

For nearly 100 years, U.S. educational policy and funding have separated vocational (now career and technical) education from mainstream education policies and funding. In California, this separation has led to dual, and often dueling, systems of education, with some advocating for career and technical education (CTE) while others lobby exclusively for college preparatory curriculum. This division extends throughout the system—from teacher credential requirements, standards, facilities, funding, data collection and reporting, and program administration. Ultimately, it is a counter-productive separation, as students need these systems to work together to optimize resources and opportunities that will prepare them for college and career, both objectives and not just one or the other.

Some educators have led efforts to bridge the gap between CTE and college preparatory emphases—overcoming regulatory barriers, using funds creatively, tapping into community resources, seeking outside funding, requesting state waivers, and exercising other means to ensure students gain access to pathways. To offer pathways to an increasing number of high school students, some finance and governance structures need modification.

Policy Recommendations:

FINANCE

- Allocate funds based on the cost of implementing pathway programs, considering that many advanced technical courses require more funding for reduced class size, equipment, and special facilities.
- Develop policies promoting more flexible and shared use of categorical funds for those adopting multiple pathways to allow schools and districts to address programmatic needs (e.g., flexible scheduling, work-based learning opportunities, supplemental support services, etc.).
- Enable more flexible and shared use of facilities (those in school districts, ROPs, colleges, and community and industry) to maximize use of facilities funding.

GOVERNANCE

- Designate one or more state-level leaders to spearhead the multiple pathways approach and provide the necessary resources to do so.
- Align state policies affecting the implementation and outcomes of multiple pathways, such that secondary and postsecondary as well as academic and technical programs reinforce each other's work in the adoption of multiple pathways and that they are likewise aligned with industry and business' needs.

State Education Data Systems

To better assess the effectiveness of high school programs in preparing students for *both* postsecondary education and employment, policy makers need appropriate indicators and data systems to collect the appropriate data. The indicators should be able to track students from high school to further education, training options, and employment. Specific indicators might include high school graduation rates, postsecondary enrollment (including public and private two- and four-year colleges, apprenticeship programs, military, and formal employment training), postsecondary remediation rates, postsecondary persistence and completion rates, certificates and degrees earned, employment rates, earnings, and other factors.

Policy Recommendations:

- Determine which measures the state will use as success indicators for high schools generally and multiple pathways in particular.
- Modify current data systems to effectively monitor these outcomes; fund further data system development to ensure appropriate information can be monitored.
- Determine which indicators the state should incorporate into state accountability systems and when changes should take effect.

SUMMARY OF RESEARCH / EVIDENCE SUPPORTING RECOMMENDATIONS

Studies examining multiple pathways or separate elements of the approach (such as context-based learning, an integrated curriculum, or programs offering a blend of academic and technical courses) have found increased achievement, graduation rates, and wages for participants. Following are a few examples:

An integrated academic and technical curriculum may lead to higher test scores if implemented well. In a particularly rigorous and prominent study, CTE teachers were paired with math teachers who identified the mathematical content embedded in the CTE teachers' subjects—agriculture, auto technology, business and marketing, health, and information technology—and then developed lesson plans to teach the math within the occupational context. The 57 CTE teachers who helped develop the math-enhanced lessons were randomly assigned to classrooms and delivered the curriculum for one year for about 10 percent of class time; 74 CTE teachers not participating in such development taught other classrooms with traditional instruction. The almost 3,000 students participating were given math pre-tests and were tested again a year later. Students taught the curriculum developed by the integrated teacher teams significantly outscored the control group on two tests of math ability.¹²

Integrated curriculum combined with work-based learning and career guidance leads to higher wages after high school. An MDRC study, employing experimental design and random assignment, examined the outcomes of 1,700 students enrolled in career academies, which offer the multiple pathways approach, serving predominantly minority students. The study showed that five years after graduation from high school, compared with similar students, career academy graduates were earning more. While this was true for both males and females, it was statistically significant for academy males—who earned 18 percent or \$10,000 more over the four-year period after high school.¹³

Students may be more likely to complete the a-g requirements needed for eligibility to the UC and CSU systems when participating in multiple pathways. A ConnectEd study of 33,000 California Partnership Academy students found that 50 percent of graduating seniors had completed the a-g requirements compared with only 35 percent of graduates statewide. Graduation rates were also better with 96% of academy seniors graduating while only 87 percent did so statewide.¹⁴ (Data was unavailable for the study to calculate graduation rates from entry in 9th grade to graduation.) While it is possible that selection effects—that students enrolled in the academies were more motivated or better prepared to begin with—account for some of the outcome, it seems unlikely that it could explain such a large difference.

Even without an integrated curriculum, students simply taking both academic and technical courses may have lower dropout rates and better achievement gains than comparison groups of students. A study of California's Regional Occupational Centers and Programs, the state's largest CTE program which serves high school students and adults, found in examining data on more than 4,000 students that those in the ROCPs improved their grade point averages more than comparison students not enrolled. They were as likely to enroll in postsecondary education and to earn higher wages. Significantly, these students were lower achieving and of lower socioeconomic status than the comparison group.¹⁵

ENDNOTES

¹ California Department of Education. Retrieved 9/24/07

<http://dq.cde.ca.gov/dataquest/CompletionRate/CompRate1.asp?cChoice=StGradRate&cYear=2005-06&level=state>.

² MDRC. (2007). *Fast fact: How much is a college degree worth?* Retrieved September 28, 2007, from http://www.mdrc.org/area_fact_33.html.

³ Bridgeland, J. M., John J. Dilulio, J., & Morison, K. B. (2006, March). *The silent epidemic: Perspectives of high school dropouts*. Washington, DC: Civic Enterprises, LLC.

⁴ Alliance for Excellent Education. (2007, June). *Understanding high school graduation rates in California*. Issue Brief. Washington, DC: Author. Retrieved 9/28/07 http://www.all4ed.org/publications/wcwc/California_wc.pdf.

⁵ The National Center for Public Policy and Higher Education. (2004, April). *The education pipeline: Big investment, big returns*. San Jose, CA: Author. Retrieved 9/28/07 <http://www.highereducation.org/reports/pipeline/pipeline.pdf>, citing 2001–02 data from national sources.

⁶ Casner-Lotto, J., & Barrington, L. (2006, October). *Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce*. The Conference Board, Corporate Voices for Working Families, Partnership for 21st Century Skills, Society for Human Resource Management. Retrieved 9/28/07 http://www.21stcenturyskills.org/documents/FINAL_REPORT_PDF09-29-06.pdf.

⁷ For a discussion of employer surveys, including the 2001 National Association of Manufacturers survey and, in 2006, both the Chamber of Commerce and Conference Board surveys, respectively, see Barton, P. E. (2006). *High school reform and work: Facing labor market realities*. Policy Information Report. Princeton, NJ: Educational Testing Service. Retrieved 9/28/07 <http://www.ets.org/Media/Research/pdf/PICHSWORK.pdf>; Casner-Lotto, J., & Barrington, L. (2006).

⁸ Ibid.

⁹ National Governor's Association. (2005, July 16). *Summary of results for the Rate Your Future survey*. Washington, DC: NGA Center for Best Practices. Retrieved 9/28/07 <http://www.nga.org/portal/site/nga/menuitem.9123e83a1f6786440ddcbeeb501010a0/?vgnnextoid=2d7ef891bc025010VgnVCM1000001a01010aRCRD>.

¹⁰ Ibid.

¹¹ Bridgeland, et al. (2006).

¹² Stone III, J. R., Alfeld, C., Pearson, D., Lewis, M. V., & Jensen, S. (2006). *Building academic skills in context: Testing the value of enhanced math learning in CTE*. Columbus, OH: National Dissemination Center for Career and Technical Education, Ohio State University. Retrieved 9/28/07 <http://www.education.umn.edu/nrccte/publications/PDFResearch/MathLearningFinalStudy.pdf>.

¹³ Kemple, J. J., & Scott-Clayton, J. (2004, March). *Career academies: Impacts on labor market outcomes and educational attainment*. MDRC. Retrieved 9/28/07 http://www.people.fas.harvard.edu/~jclayton/files/KempleScott-Clayton_2004_CareerAcademies.pdf.

¹⁴ Bradby, D., Malloy, A., Hanna, T., & Dayton, C. (2007, March). *A profile of the California partnership academies, 2004–2005*. Berkeley, CA: ConnectEd: The California Center for College and Career and Career Academy Support Network, University of California Berkeley. Retrieved 9/28/07 http://www.connectedcalifornia.org/publications/CA_Partnerships.pdf.

¹⁵ Mitchell, D. E. (2006, October). *California regional occupational centers and programs (ROCP) 2006 longitudinal study technical report*. Riverside, CA: School Improvement Research Group, University of California, Riverside. Retrieved 9/28/07 <http://www.carocp.org/2006LongitudinalStudy.pdf>.