

▶▶▶▶▶ **Earning,  
Learning,  
and Choice**  
*Career and Technical Education  
Works for Students and Employers*

*Report of the  
NAVE Independent Advisory Panel  
June 2004*

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This report is also available on the U.S. Department of Education's National Assessment of Vocational Education Web site at: <http://www.ed.gov/rschstat/eval/sectech/nave/index.html>

# Preface

This report of the NAVE Independent Advisory Panel fulfills an important obligation under the 1998 Carl D. Perkins Vocational and Technical Education Act (Perkins III). Perkins III

directed the Secretary of Education to complete an “independent evaluation and assessment of vocational and technical education programs under this Act” (Section 114(c)(3)). The law also directed the Secretary to appoint an Independent Advisory Panel to provide advice on conducting this National Assessment of Vocational Education (NAVE). Such a panel was selected in mid-1999 and included employers, secondary school and district administrators, representatives of postsecondary institutions, state directors of vocational education at both the secondary and postsecondary levels, union representatives, education and workforce development policy experts, and researchers with experience in relevant fields.

The panel met on seven occasions to (1) identify the key policy and research questions NAVE was to address, (2) review the analytic framework and study designs, and (3) receive and help interpret results from NAVE analyses, including those described in the NAVE final report already transmitted to Congress. Perkins III required the panel to submit to Congress and the Secretary of Education its own independent analysis of NAVE findings and recommendations. This report contains that independent analysis, and the judgments expressed in it are solely those of the panel and do not represent the views of the NAVE authors or the U.S. Department of Education.

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# Independent Advisory Panel



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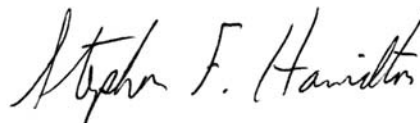


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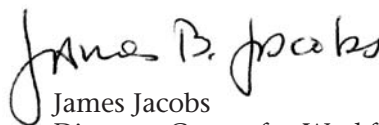
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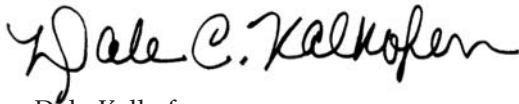
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## Independent Advisory Panel—continued



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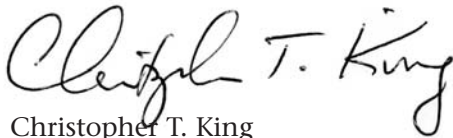
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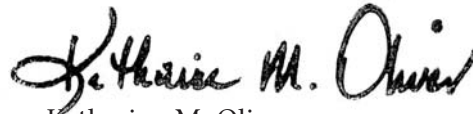
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# Earning, Learning, and Choice

*Career and Technical Education  
Works for Students and Employers*

Twenty years ago, *A Nation at Risk* called upon schools to turn back the rising tide of educational mediocrity threatening American competitiveness and living standards. Arguing that access to well-paying jobs increasing-

ly would depend on strong academic and technical skills, the report recommended that **all** teachers expect more of their students and that **all** high school students take the New Basics curriculum of at least four credits in English, three credits each in mathematics, science, and social studies, and a half credit in computer science. Responding to the report, many states increased academic course graduation requirements and introduced a minimum competency test requirement for receiving the high school diploma.

Career and technical education, which was also subject to criticism for not providing sufficient academic fundamentals, had to respond as well. The Carl D. Perkins Vocational and Technical Act of 1990 focused on integrating academic and vocational proficiencies, and the 1998 Perkins Act made rigorous academic standards and accountability additional priorities for career and technical education.

Career and technical education (CTE), a formal part of American education since the first federal vocational education law was passed in 1917, has changed not only in response to the education reform movement but also to changes in our nation's economy. CTE now is increasingly linked to high academic standards as well as particularly responsive to our nation's need for a labor force better prepared with the diverse skills required for our knowledge-based economy. In addition to significantly enhancing students' earnings, CTE expands their opportunities for learning, careers, and further education.

These are the key messages we wish to convey as the congressionally mandated Independent Advisory Panel to the National Assessment of Vocational Education (NAVE). Our 22-member panel includes state and local career and technical education leaders at the secondary and postsecondary levels, business and labor leaders, academics, and workforce development professionals. The panel was charged by the 1998 Carl D. Perkins legislation with providing independent advice to the secretary of education on implementing NAVE and reporting to the Congress on “. . . the issues addressed, the methodology of the studies involved, and the findings and recommendations resulting” from it [Section 114 (c)(2)]. The panel has met seven times since it was selected in 1999 and has drawn on the findings of NAVE, as well as other research and its members’ own experience and expertise, in articulating the ideas and recommendations presented in this paper.

We are united around three large and important conclusions: First, CTE “works” by increasing earnings for students. Second, the changes that have been initiated under the Perkins Act are aligning CTE with the school reform movement and raising academic standards for CTE students. And third, CTE provides students with choices for how to learn and which careers and postsecondary education options to pursue.

## CTE Increases Earnings

High school career and technical education helps students develop technical skills that are highly valued by employers. The most significant effect of secondary school CTE is the boost in earnings and wages that students get from even a handful of courses. Analysis of nationally representative data for NAVE found that taking four high school CTE courses increases a student’s average earnings by \$1,200 immediately after graduation and by \$1,800 seven years later. Because the instructional cost of a high school CTE program is less than \$6,000, this amounts to a rate of return of more than 20 percent per year.<sup>1</sup> Rates of return on

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<sup>1</sup>Rates of return describe the annual payoff, usually over a number of years, of an investment or one-time cost. Because they compare benefits to costs, rates of return characterize the payoff of CTE in a way that is independent of how many courses a student takes.

the investment in CTE are equally high when students take only two or three courses. Millions of high school students who take several career and technical courses reap this short- and medium-term benefit. In addition, given the fact that 37 percent of America's three million annual high school graduates go directly to work after receiving their diplomas, it is critical that they be prepared for the labor market.

Since most students work to put themselves through college, the skills learned in CTE courses can help them pay for their higher education. This is one reason why more than 50 percent of those who complete a CTE concentration in high school are able to attend college and persist long enough to obtain at least a two-year degree or certificate. In addition, because CTE is more likely to benefit those students who are less well served by strictly academic classes, these students are more likely to stay in school learning productive skills than to drop out and potentially burden the welfare or criminal justice systems.

Economic benefits also accrue to the millions of students who participate in career and technical education at the postsecondary level. NAVE reports that for each year of postsecondary vocational education, participants earn between 5 and 15 percent more than high school graduates with similar characteristics. Earnings for women who receive an associate degree in a CTE field are on average 47 percent higher than those for females with only a high school diploma, whereas CTE associate degrees for men raise average earnings by 30 percent over similar high school graduates. These earnings gains for women help to close the gender gap in earnings. They are particularly impressive given the fact that more than one-fifth of these students are from economically disadvantaged backgrounds.

**opportunities**  
*In addition to significantly enhancing students' earnings, CTE expands their opportunities for learning, careers, and further education.*

Thus, at both the secondary and postsecondary levels, CTE plays an important role in advancing economic opportunity and social equity. In contrast to the mixed results of many other initiatives intended to improve earnings and well-being among disadvantaged populations in the United States—including short-term adult training programs—CTE stands virtually alone in having an unambiguously positive economic effect.

## CTE Improves Learning

Learning among CTE students has undergone a major transformation during the last two decades: Students have demonstrated significant increases in academic course taking, test score results, and college matriculation. Prompted by congressional direction, the CTE system has responded.

Indeed, CTE students have been closing the gap with academic students. CTE programs have led the way toward increasing the number and rigor of academic courses required. As a result, the number of academic courses taken by occupational concentrators increased by nearly 30 percent from 1982 to 1998 without a corresponding decline in the number of CTE courses taken. During the same period, the number of CTE students completing the New Basics curriculum has risen from 5 percent to 46 percent. Today, 26 percent of CTE concentrators take trigonometry, pre-calculus, and other advanced math courses, compared to 42 percent of other students. The proportion of U.S. students successfully completing both college prep and vocational concentrations in high school has risen from 1 percent in 1982 to 7 percent in 1998.

The types of CTE courses that students are taking are also changing in response to employers' growing knowledge and skill demands. Since 1982, enrollments in traditional fields such as auto mechanics have been declining, while health-care courses have more than tripled their enrollment, and communications and information technology have nearly quintupled their enrollment. Rather than a low road to a high school diploma, CTE is now a rigorous and rewarding means

of acquiring the academic and technical learning that meets the high standards required for both productive employment and further education.

This greater emphasis on academics has produced quantifiable results. The test score gap between CTE concentrators and other students is closing. For example, reading scores of CTE concentrators rose by nearly a grade equivalent on the National Assessment of Educational Progress (NAEP) scale<sup>2</sup> between 1994 and 1998, according to NAVE.

CTE keeps students engaged in learning, as data show that the option of taking CTE courses reduces the probability of dropping out of high school. Without this option, more young people would be left behind.

Another sign of the increased academic proficiency of CTE students is the fact that college attendance among CTE students increased by 32 percent between 1982 and 1992, keeping pace with increases in postsecondary attendance among all students. Nearly half of vocational concentrators go on to college, compared to 64 percent of college prep students. The articulation agreements linking high schools and community colleges that were encouraged by tech prep and other initiatives have made CTE a bridge between secondary and postsecondary education. In fact, high school CTE programs increasingly serve as a pipeline to community colleges.

In short, CTE students have opted for more academic rigor in their studies and have remained engaged in their learning.

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<sup>2</sup>National Assessment of Educational Progress, the test that is popularly known as “the Nation’s Report Card.”

## CTE Provides Choices

Career and technical education empowers students by providing a range of learning opportunities that serve different learning styles. CTE relies on a powerful mode of teaching and learning that cognitive scientists call “contextual” or “situated” learning, both in classrooms and in workplaces. For many students, applying academic and technical skills to real-world activities, using computers and other tools, and being able to see how their learning is related to the world of work make CTE classes more interesting and motivating, and more educationally powerful, than standard academic classes. A career focus often gives students a sense of direction and motivates them to achieve and to stay in school. Practically inclined students can become hooked on academic learning through CTE study. This is especially important for young people who learn best by doing, a group that includes disproportionate numbers of disadvantaged and special education students. Just having the option of being able to concentrate in CTE in high school results in more young people staying in school because more individually relevant choices are available to them.

*At both the secondary and postsecondary levels, CTE courses enable students to develop marketable skills that meet industry-recognized skill standards.*

Academically inclined students taking CTE courses also benefit from getting different kinds of learning experiences that can complement their academic learning to give them a richer, more rounded education and help them identify and refine their education and career goals.

Most European countries offer a very broad range of CTE programs that attract a majority of upper secondary school students. Because of the greater number of CTE options offered there, secondary school graduation rates

and proportions of 15- to 19-year-olds attending school or college are higher in Europe than in the United States.

CTE also allows students to explore career options and clarify career goals. CTE promotes learning in workplaces through internships, job shadowing, cooperative education, and apprenticeships. More students now gain some work experience as part of their high school program—31.6 percent in 1998 compared to 28.3 percent in 1990, NAVE reports. High school seniors describe CTE classes and related work experience as very helpful to them in clarifying their career goals.

At both the secondary and postsecondary levels, CTE courses enable students to develop marketable skills that meet industry-recognized skill standards. As a result, students can earn credentials or certificates that are valuable for career placement and advancement. Youths and adults gain occupational skills through secondary and postsecondary education more efficiently and without the stigma often attached to remedial employment training programs. As a result, high school CTE has a much higher rate of return than second-chance programs such as Jobs Corps.

In short, CTE prepares students for a variety of postsecondary options, including higher education, skilled employment, and lifelong learning. For the 1.25 million high school graduates who go directly to work after graduating each year, and for many of those who have not yet completed high school, CTE provides skills that are critical in first jobs. And for the millions who do not attain a four-year college degree, an associate degree provides a recognized credential for countless career options.

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## Recommendations

While today's career and technical education is clearly providing meaningful benefits to millions of American students, it can be improved so that our education system successfully prepares our young people for rewarding careers and helps our nation's workforce be the best trained and most productive in the world.

Approved, high-quality programs of study should become a central feature of future CTE legislation at the federal level.

What would such programs look like? A CTE program of study is a multi-year sequence of courses that integrates core academic knowledge with technical and occupational knowledge leading to higher levels of skill attainment and whose curriculum is organized around a unifying career theme. Such a program of study provides students with a pathway to postsecondary education and a career by detailing academic and occupational competencies needed for advancement and by providing a series of related courses. Programs of study must provide articulated pathways between the high school and postsecondary curricula and help students move efficiently into college and careers.<sup>3</sup>

Programs of study can take several forms. They resemble or are found in career clusters, career academies, tech prep programs, small learning communities, and small schools. Secondary students in CTE programs of study take a core academic curriculum that is strong in literacy development, numeracy, and science, together with a concentration of electives in a broad career area.

In addition, career-themed programs of study must provide comprehensive career exploration and counseling. Partnerships with employers and the community are needed to help provide information about careers and the workplace to students and their parents, to expand the roles of mentors or advisers, and to help relieve the burden on school counselors.

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<sup>3</sup>See Brand, Betsy, "Rigor and Relevance: A New Vision for Career and Technical Education" (American Youth Policy Forum, 2003).



The federal government is well positioned to support the development of programs of study by creating, evaluating, and disseminating effective practices. It should continue to play a leadership role by funding strategically designed programs and sharing information on best practices, thus promoting the continuous improvement of CTE in our schools and colleges. The federal government should invest in research to determine how young people best learn skills and acquire knowledge. This will have significant payoff for our nation in the years ahead.

Continuous improvement and greater accountability for outcomes, in line with the school reform movement and the No Child Left Behind Act, require rigorous research, with targeted evaluations, technical skills assessments, and better tracking of employment and earnings outcomes.

Rigor cannot be assured when there is limited accountability for CTE program outcomes. As NAVE indicates, there is considerable inconsistency of measurement across and within states, and measurements often are not tied to outcomes of interest. Overarching assessments such as NAVE are important to get a national picture, but CTE has suffered from a dearth of research that evaluates local promising practices aimed at the broader goal of developing well-educated, highly trained citizens and workers.

We need to bring a meaningful and consistent standards and assessment strategy to career and technical education. Outcomes—such as college matriculation and completion rates, skills attainment, attainment of industry-recognized credentials, employment, and earnings—need to be better measured, and schools need to be held accountable for these outcomes. Student achievement would benefit from investments in assessment systems that take into account more than just academic skills, for example, skills that will be important for young people's future employability. In addition, given current problems in measuring

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and comparing outcomes across and within states, the federal government should support states in developing meaningful data collection systems for career and technical education that are coordinated with the accountability systems required by No Child Left Behind. One way to do this would be to develop

means by which income gains can be measured and linked to specific degrees earned.

**support**  
*In addition to supporting changes in the CTE curriculum, the federal government needs to support improved CTE teacher preparation and development.*

Consistent with this, the federal government needs to step up its support for programs and activities that explicitly, and successfully, integrate academic and career and technical education. Since there is basic agreement that young people need both good academic skills and higher-order career competencies, federal dollars should go to CTE programs that emphasize these academic connections, evaluations that measure this learning, and efforts to replicate programs that succeed.

While federal policy and funding for CTE clearly must be aligned with No Child Left Behind and broader efforts to improve student achievement, these funds should focus on the goals of continuing to prepare students for careers and life-long learning, but with a greater academic focus. One of the goals should be to prepare students to succeed in postsecondary education even if they do not choose to enter postsecondary education right after high school or if they choose to pursue education and work at the same time.

To further enhance academic achievement among CTE students, in addition to supporting changes in the CTE curriculum, the federal government needs to support improved CTE teacher preparation and development. Despite some promising changes, a profound pedagogical disconnect exists between most academic and CTE teachers, with few interested or able to venture onto the instructional turf of the other. Many CTE teachers lack the mathematics and other academic knowledge to be able to integrate these subjects into their curricula, and they have few opportunities for professional development in which to gain these skills, as NAVE reports.

Because teachers are such a vital part of the learning process, federal funding and policy should foster the improvement of CTE teachers' academic skills. CTE teacher training in math, science, English, and other subjects, as well as the integration of academic teachers into contextual CTE foundation skills programs, would go a long way to enhance the academic rigor of career and technical education. Professional development should ensure depth of content knowledge; provide a strong foundation in pedagogy; be rooted in best available practices; contribute to measurable improvement in student achievement; provide sufficient time, support, and resources to enable teachers to master new content and pedagogy, and integrate these into their practice; and provide opportunities for CTE and academic teachers to plan jointly.

The federal role should be to support state and local CTE leaders as they develop, institute, and promote the improvements called for in this paper and in the NAVE report itself. Because previous NAVE reports and other research have demonstrated the importance of effective state leadership in promoting curriculum integration, secondary-postsecondary articulation, and other Perkins reforms, states should have considerable latitude in designing systems and initiatives that meet the legislation's goals. Thus, the federal government should reinforce and support the states' role in reforming CTE, as long as states are held accountable for making these reforms.

The federal government can also help CTE programs improve their connections to employers through support of industry-endorsed skill standards and assessments and by providing better, more updated labor market demand data. In addition, because students consistently report that college and career planning activities in high school are helpful, the federal government should support efforts to improve career guidance and counseling services.

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Clearly, if we want at least 14 years of education to be the norm in America, we must do much more to make the transition from high school to college more seamless to enable more of the two-thirds of young adults who do not receive a bachelor's degree to earn a postsecondary degree. Limited federal funds for postsecondary career and technical education need to be targeted to efforts that get secondary and postsecondary CTE programs to work together so that career and technical students can follow more clearly delineated pathways from high school to community college. In well-coordinated programs, community colleges can enhance the quality of vocational learning at the secondary level. The federal investment also should be used to improve career information and linkages to employers for secondary school students. In a new version of the federal law, well-marked pathways through various educational levels and into the labor market should be a main feature of all state plans.

## Conclusion

By promoting a new, more rigorous vision for career and technical education, the federal government can have a profound influence on how state and local funds are spent and how millions of students are educated.

The federal government is involved in career and technical education to enhance the well-being of the American people. Our nation needs, and will continue to need, highly skilled workers with strong academic, occupational, and technical skills. Although the federal government, through the Perkins Act, provides only a small fraction of the total resources devoted to CTE in the United States, its investment is strategic and essential.

Federal support for CTE signals the priorities that national policy-makers want for career and technical education. Legislation can specify that funded programs should not only develop students' occupational skills to meet challenging standards but also contribute to students' academic improvement. In addition, federal legislation can direct secondary school CTE programs to encourage

students to pursue postsecondary education or training and can focus on increasing disadvantaged students' access to high-quality CTE programs.

The federal government is also able to distance itself from state and local policies that inhibit reform and to help promote equal access by providing funding targeted to low-income communities. National leaders can play a vital role in coordinating policies and funding among the many federal initiatives designed to improve our people's skills and well-being—ranging from the No Child Left Behind Act and the Higher Education Act to the Workforce Investment Act and Temporary Assistance to Needy Families. Federal funding is also important for ensuring a focus on results because accountability requirements mean that federally funded CTE programs must demonstrate continuous improvement if they are to continue to receive federal support.

If we truly want to leave no child behind academically or economically, we need to combine our humanistic values with an awareness of educational and labor force realities and a recognition that one-size-does-not-fit-all. We need young people who are able to gain the very best academic skills. While 65 to 70 percent of American youths do not go on to receive four-year degrees, and a commensurate number of jobs do not require such degrees, we do not do as well in ensuring that our millions of students are literate, numerate, civic-minded, and prepared for careers after 12 or 14 years of education. Finally, the hundreds of thousands of young people who do not graduate from high school or are at risk of dropping out are at risk of being excluded from the American Dream unless we concentrate our efforts to engage them in their education. As we look ahead to new federal CTE legislation, it is this vision of a reformed career and technical education that we hold up. It is one in which academic rigor and real-world relevance, buttressed by strong accountability, combine to provide expanded opportunity for millions of young Americans.

*vision*  
*We need to combine our humanistic values with an awareness of educational and labor force realities and a recognition that one-size-does-not-fit-all.*