

EDUCATION WEEK

Diplomas Count: Ready for What?

Preparing Students for College, Careers, and Life After High School

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Published: June 12, 2007

What Does 'Ready' Mean?

There is plenty of confusion about what it means to fully prepare students for life after high school.

By [Lynn Olson](#)

As high school commencement time rolls around, states are working to ensure that their graduates are "ready" for life after high school.

Eleven states report that they have adopted a definition of "college readiness," and 14 more are in the process of doing so. Twenty-one states report they have a definition of "work readiness," and 10 more states are tackling the issue.

Despite all the activity, there is still plenty of confusion about precisely what it means to be "college" or "career" ready. Do Americans expect all students to be ready for college *and* work—or just for one or the other? And if they're saying all students should be ready for both, does that mean every teenager must have exactly the same preparation in high school?

A few things are clear, as an analysis conducted by the [Editorial Projects in Education Research Center](#) for this report shows: Having at least some college under your belt is more likely to land you a decent job at a decent wage. And young people who lack a high school diploma have a tough time finding any job at all.

Because the discussion about college and career readiness typically tilts heavily toward preparation for college, this edition of *Diplomas Count* looks more closely at what it means to be "career ready," based on the recognition that even college graduates will eventually have to find their way in the labor market.

While better defining college and career readiness requires the formal involvement of both higher education and the business community, state K-12 players, in general, have found it easier to reach out to their postsecondary brethren than to employers. In part, that's because most states lack the business equivalent of a university system's board of regents. In addition, local businesses come in all shapes and sizes—making it hard to define the target job market for which high school graduates should be prepared.

"The task here is not to figure out what a student leaving high school needs to know in order to do any first job they're going to get when they leave high school," says Michael Cohen, the president of



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the Washington-based nonprofit group **Achieve**, which focuses on issues of college and workforce readiness. "There are plenty of those jobs that don't require high skills and that high schools shouldn't be expected to prepare students for, because they don't open doors of opportunity."

In contrast, he argues, states need to focus on areas of high-skill, high-wage job growth that may not necessarily require a four-year college degree, but typically do require some education and training beyond high school.

To help states see how large that job market is, the EPE Research Center has conducted an analysis for this report that examines the distribution of jobs within each state and the related education and pay levels.

The analysis uses information from the **Occupational Information Network**, or O*NET, a database developed for the **U.S. Department of Labor**. O*NET classifies jobs into five "zones," each defined by various worker attributes, including particular education, training, and experience requirements. Using another national database—the **American Community Survey**, conducted by the **U.S. Census Bureau**—the EPE Research Center is able to show what proportions of adults in each state hold occupations in the various job zones, their median earnings, and their average education levels.

The findings underscore that to earn a decent wage in this country, young people need to anticipate completing at least some college. For Job Zone 3, for which the median annual income is \$35,672 nationally, 37 percent of jobholders have some college education and another 26 percent hold a bachelor's degree. For Job Zone 4, with a median annual income of \$50,552, fully 68 percent of jobholders have a bachelor's degree and 21 percent have some college. Fewer than one in 10 employees in Job Zone 3 or higher have less than a high school diploma.

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At the bottom end of the job-zone classifications, in which workers with a high school diploma or less are concentrated, the median annual income is \$12,638 a year.

But while the analysis confirms the strong link between education and earnings, it's just a first step. For one thing, it captures only a moment in time. It doesn't show what a state's job market will look like when today's 18-year-olds are in their 40s. And it doesn't answer the more detailed question that many states are now struggling with: What's the precise mix of academic and nonacademic skills that best prepares young people to take advantage of labor-market opportunities?

Academic Gaps

Clearly, employers want better academic skills than many high school graduates now possess.

A **survey of more than 430 human-resource officials, conducted in spring 2006** by the New York City-based Conference Board, found that 72 percent rated recent hires as deficient in basic English writing skills, such as grammar and spelling, and 81 percent rated them as deficient in written communications more broadly, such as memos, letters, and complex technical reports.

In a **2005 survey**  conducted for the National Association of Manufacturers, 84 percent of respondents said schools were not doing a good job preparing students for the workplace, with more than half citing specific deficiencies in mathematics and science and 38 percent citing deficiencies in reading and comprehension

Daniel Furman, the director of education policy for the nonprofit **Fund for Colorado's Future**, which provided staff support for a governor-appointed council to align high school standards with the demands of college and work, remembers being surprised by a representative of the Denver pipe fitters' union.

"He had just looked at 100 applications," he says, "and he mentioned they just had weak math and science skills. For a pipe fitter, perhaps you don't assume that you need individuals with strong math and science skills, but in fact you really do."

Through the **American Diploma Project Network**, coordinated by Achieve, 29 states have committed to aligning their high school standards with what it takes to succeed in college and the workplace. Achieve, which was formed by business leaders and state governors, has been working with 24 of those states to help them adopt high school standards that meet that goal.

Based on that work, the group has found that state standards tend to lack attention to several key areas that college faculty members and business leaders have identified as critical for success:

- While high school English standards and courses tend to emphasize literature, most of the reading material students will encounter in college or on the job is informational, such as textbooks, manuals, articles, briefs, and essays.
- While state academic-content standards tend to stress narrative writing, most of the writing young people will do in college and at work is to inform or to persuade, often requiring them to conduct research and use evidence to support a position.
- The ability to work in teams and to orally present one's work is cited by professors and employers as critical for success. Yet state standards don't always cover those skills sufficiently, according to Achieve.

On the math side of the ledger, Achieve found that state standards sometimes fall short on data analysis and statistics, and often give only superficial treatment to important geometric concepts, such as proofs. Moreover, while reasoning and solving mathematical problems are often cited as the most important skills for both college freshmen and employees, state standards don't always cover those topics explicitly.

Studies have found that students who take advanced math courses such as Algebra 2 in high school or who score higher on math tests are more likely to succeed in college and secure better-paying jobs. But some researchers and labor experts say that in many high-salary, in-demand jobs, the level of math actually needed rarely rises above the 9th or 10th grade level. Fluency in advanced math topics is less crucial, they contend, than skills in solving problems and applying math to different tasks.

College professors appear to agree. Based on a **national survey of more than 6,500 middle school, high school, and postsecondary teachers**, the Iowa City, Iowa-based test-maker ACT Inc. found that postsecondary instructors rated being able to understand and rigorously apply fundamental math skills and processes as more important than exposure to more advanced topics.

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this stuff in the real world?" says Cohen of Achieve.

That question has led states such as Louisiana to search for examples of the specific math or English skills needed in various occupations, in part to demonstrate the relevance of state content standards to the business community.

Louisiana officials point out, for example, that to calculate drug dosages, nurses with an associate's degree need to know how to calculate and apply ratios, proportions, rates, and percentages. Nurses with a bachelor's degree must be able to select and use formal, informal, literary, or technical language appropriate for their audience so they can write formal reports to health-care managers.

"I just think there's such a lack, in textbook or curriculum guides, of 'real world' applications" of such skills, says Stanley G. Jones, Indiana's commissioner of higher education.

Soft Skills

Employers complain even more, though, about a lack of "soft" or "applied" skills among America's high school graduates than about inadequate academic skills.


In the Conference Board survey, for example, 70 percent of human-resource officials cited deficiencies among graduates in applied skills, such as professionalism and work ethic, defined as "demonstrating personal accountability and effective work habits, such as punctuality, working productively with others, time and workload management."

Similarly, in the NAM survey, 55 percent of employers rated the public education system as deficient in equipping students with basic employability skills, such as attendance, punctuality, and a strong work ethic.

Those sentiments were echoed in focus groups and roundtables that were conducted in Arkansas and Colorado with local employers.

In his state, says Furman of the Fund for Colorado's Future, employers complained that high school graduates "would not come into an interview dressed appropriately. They would not come prepared to talk about the job they were interviewing for."

"If they were lucky enough to land a job," he says, "they didn't realize they had to show up to work on time Monday through Friday."

In Arkansas, according to a **January 2007 study by the Arkansas Department of Education** , 76 percent of employers said recent high school graduates who applied for jobs in their companies lacked the necessary writing skills and the ability to do basic math. And more than 60 percent weren't satisfied with graduates' ability to read and understand instructions and other materials.

But the lack of soft skills—defined as everyday social skills, such as work ethic, verbal and nonverbal communications, attendance, interview abilities, and attitude—dominated the complaints of business leaders in Arkansas.

As one Arkansas employer said in a focus group, "We want somebody who shows up on time, somebody who works hard, and someone who's trainable."

James E. Rosenbaum, a sociologist at Northwestern University who's


"Employers we interviewed said they were able to redesign jobs

interviewed employers about their workforce needs, says: "Employers we interviewed said they were able to redesign jobs around academic-skill deficiencies, but not soft-skills deficiencies."

Nearly all jobs, he says, "require basic work habits, such as regular attendance, motivation, and discipline, and our schools are not taking steps to improve students in these areas. Indeed, the opposite may be occurring. If teachers are compelled to focus more on academic skills and test scores, they may devote less attention to soft skills and efforts to improve them."

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At least one analysis  by the Princeton, N.J.-based Mathematica Policy Research Inc., suggests that improvements in nonacademic competencies—such as work habits and a belief that success results from hard work rather than luck—may be just as important for improving later earnings and postsecondary success for some students as gains in academic skills.

Using **data from the National Educational Longitudinal Survey**, or NELS, a federal database that followed a cohort of students from the time they were 8th graders in 1988 until 2000, the study found that for most students, improving one of the nonacademic competencies would have had a larger effect than better math scores on their chances of enrolling in and completing a postsecondary program, with 43 percent benefiting most from an improvement in work habits.

When it came to earning a bachelor's degree, however, improving math scores still had the largest effect for the most students.

In general, the Mathematica study found, students reaped the most benefit from improving in areas where they were weak. "Considering individual strengths and weaknesses when deciding which competencies to improve might be a more effective strategy than simply encouraging all students to improve the same competencies," write researchers John Deke and Joshua Haimson.

21st-Century Skills

Beyond specific content knowledge and soft skills, researchers increasingly point to a range of applied skills that span academic areas as important for success.

According to Anthony P. Carnevale, an economist and research professor at Georgetown University, individuals who score higher on measures of complex problem-solving, critical thinking, creativity, and fluency with ideas have higher mean earnings in the labor market, across all levels of education.

David T. Conley, a professor of education at the University of Oregon, says that in addition to specific content knowledge, "a range of cognitive and meta-cognitive capabilities, often described as 'habits of mind,' have been consistently and emphatically identified by those who teach entry-level college courses as being as important or more important than any specific content knowledge taught in high school."

Examples include analysis, interpretation, precision and accuracy, problem-solving, and reasoning, he writes in "Toward a More Comprehensive Conception of College Readiness," a paper prepared for the Seattle-based **Bill & Melinda Gates Foundation**. Similarly important, he continues, are the attitudes and behavioral attributes that students who succeed in college demonstrate, including study skills, time management, awareness of their own performance, persistence, and the ability to use study groups.

And the Harvard University psychologist Howard Gardner, writing in his new book, *Five Minds for the Future*, defines the cognitive abilities that he argues will command a premium in the years ahead.

He describes them as the disciplinary mind (mastering ways of thinking in one or more content disciplines or a professional craft); the synthesizing mind (able to integrate ideas across disciplines and communicate that to others); the creating mind (able to uncover and clarify new problems, questions, and phenomena); the respectful mind (being aware of and appreciating differences among human beings); and the ethical mind (knowing and acting on one's responsibilities as a worker and a citizen).

Unfortunately, Gardner writes, "No one knows precisely how to fashion an education that will yield individuals who are disciplined, synthesizing, creative, respectful, and ethical."

Such skills, moreover, are hard to assess or to insert in content-oriented state high school standards.

"It's easier to get some coalescing around standards with respect to content," says Jones, the Indiana higher education commissioner. "Some of these other concepts—like working in teams, or leadership skills, or communication skills—are harder to quantify and clearly harder to assess. And so I think people recognize their importance, but they're still grappling with how you would actually do it."

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Howard Gardner
Harvard University
psychologist

More than half the employers surveyed for the Conference Board, for example, said critical thinking and problem-solving were "very important" for successful performance on the job, yet nearly three-quarters rated recent high school graduates as deficient in such skills.

Career and Technical Education

The focus on college and workforce readiness, combined with concerns about maintaining the United States' economic competitiveness, has led at least some states to place a renewed emphasis on career and technical education.

Research suggests that participation in CTE courses can reduce high school dropout rates and increase short- and medium-term earnings for students. But the research is mixed about whether participation in various types of career and technical education reduces college-going rates—or simply has no effect.

Based on analyses using students' transcript data from the **National Longitudinal Survey of Youth 1997**, researchers Stefanie DeLuca and Stephen Plank, sociologists at Johns Hopkins University, found that while participation in career-related programs did not generally impede college attendance, students who took proportionately more career and technical courses than academic ones were less likely to attend college, even after adjusting for other characteristics.

Moreover, while students from low-income families were the least likely to participate in career-related programs and activities, they were the most likely to take higher ratios of CTE to academic courses.

Using the same database, the Johns Hopkins researchers found that a middle-range mix of career and academic courses may decrease the risk of dropping out for students who are not over the

normal age for their grades—but only up to a point, or “something in the range of one CTE course for every two core academic courses,” the authors write.

They suggest trying to keep an “optimal balance” between career and academic classes, and giving students a chance to take career classes earlier, as a way to increase graduation rates.

Given that about 45 percent of high school students earned three or more occupational-course credits throughout the 1990s, the improvement of career and technical education has to be part of the “readiness” agenda, argues Richard Kazis, the director of policy for the Boston-based **Jobs for the Future**. But CTE programs of the future need to have greater academic rigor, be more responsive to economic trends and local labor markets, and have stronger connections to postsecondary education, he says.

Maryland, for example, has redesigned its career and technical education system around 10 career clusters, representing high-growth areas of the state’s economy. More than 350 employers from across the state validated the clusters, all of which must have a postsecondary component so that students can earn at least some higher education credits while in high school.

In the 2006 graduating class, 51 percent of students who had completed a CTE program (defined as four credits in one career concentration) also had completed all the course requirements for entry into the state’s four-year public colleges.

“When we first started to measure that, in 1998, it was only 14 percent,” says Kathy Oliver, Maryland’s assistant state superintendent for career technology and adult learning. “The goal is 100 percent, and we’re moving toward that.”

This past year, the **National Governors Association** contracted with the **Monitor Group**, a consulting group based in Cambridge, Mass., to produce **analyses for each state of emerging, high-growth clusters**.

“Cluster strategies for states are efforts to take advantage of naturally existing groupings of companies, usually within a particular industry but often including suppliers,” explains Steve Crawford, who directs the NGA’s division of social, economic, and workforce programs. “That sort of expertise creates a synergy in a region and gives a competitive advantage to the companies and firms.”

While there is a well-established literature on the competitive advantage of clusters, he adds, “the key ingredient in any industry is knowledge or human talent, so part of a good cluster strategy is to make sure that universities, the high schools with their career academies, the community colleges, are producing folks with the skills you’d want.”

Vol. 26, Issue 40, Pages 7-8, 10,12

Diplomas Count is produced with support from the Bill & Melinda Gates Foundation.