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June 2006
Policy Evaluation and
Research Center
Policy Information Center
Educational Testing Service



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Preface

High school reform is front and center in the nation's attention, as well it should be. Most of the attention has been focused on the need for high school students to complete rigorous academic courses that qualify them to enter college and equip them to perform well enough on college placement tests to be assigned to regular credit-bearing courses rather than remedial courses. Substantial research supports the case that a rigorous curriculum is necessary to prepare students for success in college.

There is much less consensus, however, on how best to prepare students who are graduating from high school but who will not attend college. Some believe that high school graduates proceeding directly to the workforce need the same level of academic preparation as those going on to college. Yet analyses are not available to support this conclusion, nor to specify the kinds of skills that work-bound students need and that employers look for in new hires.

Paul Barton's report on what he calls "labor market realities" draws on his background and expertise in education policy and the labor market, particularly as a past president of the National Institute of Work and Learning. He describes how the occupational structure has changed over the past several decades, the rising

levels of education among workers, two decades of surveys about what employers look for when hiring, a pervasive view that recent high school graduates are not ready for "adult-type" jobs, projections of job openings and what they tell us about the education levels needed for the workforce of the future, and the quantitative literacy levels required to perform jobs that are now becoming available. Barton also considers the skills and knowledge that will be required for high school graduates to secure good jobs without a college diploma.

Barton's purpose is not to promote particular policies about the content of a high school education, but to bring to the attention of educators and policymakers the body of facts and knowledge about present and future work requirements, including what employers say they want — and need — from their employees. This information will be useful to policymakers defining and promoting high school reform.

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Acknowledgments

This report was reviewed by Betsy Brand, Director, American Youth Policy Forum; Richard J. Coley, Director, ETS Policy Information Center; Donna Desrochers, Vice President, Committee for Economic Development; Emerson J. Elliott, Director, Program Standards Development Project, National Council for Accreditation of Teacher Education; Drew Gitomer, Distinguished

Presidential Appointee, ETS; Samuel Halperin, Senior Fellow and Founder, American Youth Policy Forum; James Rosenbaum, Professor, University of Pennsylvania; and Dylan Wiliam, Senior Research Director, Educational Testing Service. Janet Levy was the editor and Christina Guzikowski provided desktop publishing and designed the cover.

Executive Summary

The focus of the current high school reform movement goes beyond qualifying students to enter college. It extends to raising the rigor of coursework so that students are prepared for college-level classes, rather than forced to enter remedial courses. That this is needed is based on extensive study of the gap between college admissions criteria and the more rigorous requirements for entering credit courses, as determined by college placement tests.

Reformers further assert that all students, not just the college bound, should reach that higher level of academic preparedness. The notion is that non-college-bound students require that level of preparation to enter the employment world, or as it is sometimes stated, to get “good jobs.”

To date, however, no one has extensively analyzed the subject to reach conclusions about the actual necessity of that level of achievement for all students and about the ramifications of insisting on it. This report attempts to bring together available information on the work world, what employers say they want, what employment projections show, and the requirements and qualifications necessary to meet employer needs and standards. It does not try to propose a set of policies and objectives for secondary education.

This analysis does not find support for the proposition that those not going to college need to be qualified to enter college credit courses in order to enter the workforce. It does, however, find a strong case for advancing the academic skills of a high proportion of those high school graduates if they are to compete successfully for the higher-paying jobs available to those without a college degree, and advance in such jobs. Beyond what employers are specifically looking for in job applicants, other important benefits are attached to higher levels of educational attainment.

The Age of Hiring. Little research is available on the minimum age employers set for entry into regular jobs at which adults can make a living. No current research is available, and no one has examined how the age requirements may have changed since researchers last studied the subject.

This report sets forth what is known and argues that employers, other than those in industries that rely heavily on teenagers, *do not want to hire high school*

graduates until they are well into their 20s, irrespective of how well they do in high school. That creates a large gap between the end of a person’s secondary education and his or her entry into jobs with adequate wages and benefits. Those ramifications need to be understood and addressed.

Employers Speak. This report summarizes studies of what employers say they are looking for when they hire for jobs that do not require college degrees. Such studies show that employers typically put school achievement below other qualities and attributes. The National Association of Manufacturers (NAM) conducted the most recent survey on this topic in 2001. Supportive of the findings of similar studies, the NAM study identifies the “most common reasons companies reject applicants as hourly production workers.” The reasons are shown in Table 1.

Table 1
Most Common Reasons Companies Reject Applicants as Hourly Production Workers

Inadequate basic employability skills (attendance, timeliness, work ethic, etc.)	69%
Insufficient work experience	34%
Inadequate reading/writing skills	32%
Applicants do not pass drug screening	27%
Inadequate math skills	21%
Poor references from previous employers	20%
Inadequate oral-communication skills	18%
Inability to work in a team environment	12%
Inadequate problem-solving skills	11%
Inadequate technical/computer skills	11%
Lack of degree or vocational training	8%
Problems with citizenship/immigration status	7%
Other	4%

Source: National Association of Manufacturers, *The Skills Gap 2001*, 2001.

Other surveys report somewhat different results but come from a different mix of employers and industries. The U.S. Census Bureau conducted a comprehensive survey that found the top three reasons to be attitude, communication skills, and previous work experience. Grades in school were ninth.

The NAM report supports setting educational standards but cautions that such standards “should not be pursued to the point where often equally worthy elements are driven out of the curriculum.” The report argues that partnerships between businesses and schools should be expanded and that employers should support such activities, “including providing internships that bring education and students into the workplace.”

A major new initiative by the U.S. Chamber of Commerce to develop, test, and validate a new assessment of readiness for entry-level work, scheduled for release in June 2006, will provide considerable guidance to high school reform efforts. The assessment will identify what new workers in entry-level jobs need to be able to do in the areas of communication, interpersonal, decision-making, and lifelong learning skills.

Educational Attainment and Job Requirements.

The use of employment projections for educational planning has been exclusively on average annual employment in an occupation and on the associated education requirements. What is needed are projections of *job openings*, taking into account employee turnover, retirements, and similar losses.

This report analyzes half of the 26 million job openings projected for 2001 to 2012 by the U.S. Bureau of Labor Statistics in terms of the education requirements associated with those openings and the quantitative abilities needed to perform each job in the 44 occupations involved.

- About half of the openings in those occupations, according to the Bureau of Labor Statistics, require short-term on-the-job training (one month or less experience and informal training).
- Eight require moderate-term on-the-job training (one to 12 months), and the rest require a longer period of training, a higher-education degree, or certification.
- The occupations are identified by the level of quantitative literacy needed to perform them, based on the National Adult Literacy Survey. Levels range from 1 to 5, with 5 being the highest.
 - None of the jobs is in Level 1 or 5.
 - Seventeen are in Level 2, where a typical task might be calculating the total cost of merchandise from an order form.

- Nineteen are in Level 3, where a typical task includes calculating the difference between the regular and sales price of an item in an advertisement or determining the discount for an oil bill if paid within 30 days.
- Only four are in Level 4, where tasks include using an eligibility pamphlet to calculate how much money a couple would receive for basic supplemental security income in one year.
- The report matches the 44 occupations with an education “cluster,” such as “high school/some college,” and lists the distribution of education levels of people working in them. It also shows the average job openings per year, the “most significant” source of education and training for each occupation, and the median annual earnings in the occupation in 2002. That, too, is available for all Census Bureau occupations.
- This report looks at changes in the occupational structure from the standpoint of education required to perform each job. A couple of major studies covering the 1980s and 1990s, and projecting to 2006, show that occupations with the fastest growth rates have the highest educational requirements. Those jobs are a small percentage of the total, however, and average requirements for all occupations show no change. The other kind of change that occurs is *within* an occupation. It would be a massive undertaking to measure such change in the Census Bureau’s 750 occupational classifications, but studies that have examined specific occupations have found differences over time. Such changes, due to technology and other factors, occur continuously — with unknown net results.
- To identify workers who, one day, may be able to advance in their company, some employers may seek employees who have qualifications higher than those required to do entry-level work.

The New Basics and Middle-Class Wages. What does it take to earn a “middle-class” wage in the United States? That is examined in *Teaching the New Basic Skills*, by Richard Murnane and Frank Levy.

- **Skills:** The authors found that employers wanted a set of “soft skills,” such as the basic employability skills employers cited in a National Association of Manufacturers’ survey. Complicating matters, they

found there was not a high correlation between those skills and the results of paper-and-pencil-tests.

- **Education:** Murnane and Levy identify ninth-grade levels of reading and mathematics as necessary.

Pinning down what constitutes a ninth-grade level of achievement in the United States is hard, because the distribution of achievement in any one grade is wide and varies by state. We do have good information from the National Assessment of Educational Progress (NAEP) for grades 4, 8, and 12. For each grade, NAEP defines what students have to know and be able to do to reach the *basic*, *proficient*, or *advanced* level in each subject. A description of the *proficient* level in mathematics is provided in this report. In 2003, just 29 percent of eighth-graders reached the *proficient* level, and only about half of 12th-graders reached a scale score equivalent to that level. Based on such results, there is a long way to go to raise mathematics achievement even to a level Murnane and Levy agree would enable graduates to qualify for middle-class wages.

The School of Work. Evidence abounds that employers greatly value experience, which brings with it learned behaviors, abilities, and attitudes. Because of such evidence the National Association of Manu-

facturers' report advocates employer involvement in internship programs, or cooperative education, where students alternate between school and related work.

- Cooperative education is now largely ignored, and no regular data collection addresses its scope. Cooperative education needs to be revisited.
- Opportunities for teenagers to work part time while in school, in jobs sought on their own, are diminishing. The number of in-school teenagers who work dropped from 38 percent in 2000 to 30 percent in 2004. The employment rate for minority teenagers is much lower than the rate for White teenagers. The teenage employment rates are dropping, whether the teenagers are in or out of school. Research has generally found that working a modest number of hours per week has no negative effect on school performance.

The bottom line of this report is that students' preparation for entry into the world of work has been all but invisible in national discussions of high school reform. However, a considerable amount of knowledge, facts, and information is available — or attainable — that can be used to inform a larger discussion about high school reform and the world of work.

Introduction

As the movement for high school reform gains momentum, it becomes increasingly important that policymakers have comprehensive information. Much of the recent impetus for reform comes from extensive work on identifying what is required to enter college and also pass the college placement exams for eligibility to take credit courses. More rigor is required in high school to prepare students — at least those who are going on to college — for real college-level work, not just to enter college and take remedial courses.

Typical statements about the purposes of reform say that high school graduates who are not going to college, but are, instead, going directly into jobs, require the same rigorous academic preparation as those going to college.¹ Sometimes these statements elaborate that the increased level of academic preparation is necessary for high school graduates to secure “good jobs” — but it is often unclear what is meant by good jobs, how many there are, and how many might be open to recent high school graduates.

This report was written because there has been insufficient focus on the type of high school preparation that meets the needs of students who decide not to go to college or who leave soon after enrolling — and on education that meets the needs of potential employers. It is insufficient, for example, to simply assert that all high school students should be prepared to enroll in credit courses in college math without taking remedial courses. It is also insufficient to assume that such a level of preparation is what employers of high school graduates want or need, or that there are not other important skills, behaviors, and qualities that employers want to see addressed.

This report will examine the available facts and analyses related to the abilities and qualities needed to enter employment with a high school diploma. Such knowledge should be one starting point for considering changes to high school curriculum to assure that all students are served — and in doing so, that the needs of employers and the economy are met.

Debate over what is best for preparing students for work is not new. As a nation with the highest degree

of inequality in educational attainment and income in the developed world, the United States struggles with a host of issues and choices in trying to re-create a high school curriculum for all its students. Difficulty defining purposes and setting goals is similar in many respects to the struggles over other school reform issues debated off and on during the past 75 years or so. A refresher course on those debates can be found in Diane Ravitch’s book, *Left Back: A Century of Failed School Reforms*.

In such debates, which are sure to come, there will be ideological differences over the purposes of public education; differences in judgment about effective instructional approaches; and differences over the balance among direct occupational preparation, work-readiness efforts, and academic content.

Different viewpoints, philosophies, and ideologies are to be expected. But it can also be expected, or at least hoped, that policymakers and influencers will seek and work from a common set of facts, while recognizing that different views of what the facts mean for policy will exist. Of course, what Alice Rivlin has called “forensic social science” will abound, particularly over evidence of what policies, practices, and programs have been shown to work.

From an individual’s perspective, the question of whether to pursue additional education is answered by knowing that, generally speaking, the more advanced diplomas and certificates a person gets, the better that person is likely to do financially.

From the perspective of an economist, the question is whether additional levels of education will have positive rates of return for the economy, and whether those returns are high enough, relative to other investments, to justify the increased investment in education. The economist may see the changing wage differentials between those with different levels of education as indicative of trends in the balance of supply and demand. The labor market is speaking to the question of how much it will reward the attainment of additional schooling.

¹ See American Diploma Project, *Ready or Not: Creating a High School Diploma That Works*, The American Diploma Project, Achieve Inc., The Thomas B. Fordham Foundation, and The Education Trust, 2004.

Education policymakers focus on something else entirely: how to best educate students. To determine curriculum and standards, however, policymakers must consider future job requirements. Although preparation for work is only one of several purposes of education, such information affects what schools decide to teach and the transition services they provide.

This report is written largely from the latter perspective. The writer has been around long enough to have developed informed viewpoints about policy and practice. For this report, however, policy views and program ideas have been checked at the door; a serious effort is made to provide the facts about the youth labor market that are relevant to the discussion about high school reform.

The report starts with information on the age of hiring. It continues with a discussion of what employers say they want high school graduates to know and be able to do. Sporadic surveys have produced considerably consistent findings on this topic across the years. This writer thinks it is time for another survey.

Questions raised in this report include: How has the occupational structure changed over the past several decades? How is it changing with respect to the educational attainment needed to enter occupations?

The report addresses those questions by considering trends in educational attainment, the comparative returns in employment success at different levels of educational attainment, how employment projections can inform educational planning, where job openings are expected to occur over the next decade, and the requirements of occupations that are projected to grow.

Finally, the report looks at prospects for earning a “middle-class” wage with less than a college degree, and the new basics likely required to obtain such wages. In that section, particularly, we see the need for considerable improvement in educational achievement if high school graduates are to be qualified for the better-paying jobs that can enable a middle-class life style. Such jobs are no longer as bountiful as they once were, and the earnings of high school graduates continue to erode.

The Age of Hiring

Important information is missing in the discussion of high school reform, the hiring requirements of employers, and youth employment success. This author would grant a sizable reward to anyone who found a relatively recent and fact-based analysis of typical hiring ages by employers in different occupations and industries, and changes in that hiring age over time. It is simply not on the agenda of educators, government agencies, employer organizations, or human capital or labor market economists. The absence of this knowledge can lead policymakers astray. Several research efforts in the 1970s dealt with the hiring age. Several of them are summarized below.²

The research of Hugh Folk showed how teenagers, whether dropouts or graduates, go into jobs in industries that are “teenage intensive.” He called them “youth jobs”:

Youth jobs do not necessarily lead to career jobs but are open to young workers . . . Both high school graduates and dropouts have occupational distributions that are concentrated in youth jobs immediately after leaving school.

Edward Kalachek found that when the supply of teenagers expands, as it did in the 1960s, recent graduates and dropouts do not branch out into other markets but fight for a larger share of the teenage jobs.

And then there were the initially surprising results of Gerald Bachman’s analysis of 1970 data from a longitudinal study of 2,000 10th-grade boys:

After removing extreme cases, the mean weekly earnings for graduates was \$112, compared with \$119 for dropouts. With all cases included, the dropouts averaged much better than the graduates.

Bachman found this to be consistent with data from the massive longitudinal survey Project TAL-ENT, which showed that salaries for dropouts averaged about four percent higher than for graduates. The dropouts had, of course, accumulated more work experience by the same age as the graduates, and experience is what employers are most looking for in that sector of the labor market.

Those results are consistent with the proposition that, *for the good jobs*, employers do not hire recent high school graduates — 17- or 18-year-olds. At the time of those studies, however, no data on the hiring age existed.

Daniel Diamond and Hrach Bedrosian studied jobs in New York and St. Louis that served as entry points to higher-level positions. In St. Louis, none of the hotels wanted to hire people under 21 as a hotel clerk and 94 percent of banks rejected them as tellers. Two-thirds of employers refused to consider them as hospital orderlies. The best chance the under-21 set had for securing a job was as “press feeder,” for which a comparably low 47 percent would not hire them.

The situation varied more among occupations in New York City. In banks, 78 percent would not hire below the age of 21. Another study found a similar situation in rural Southern counties.

But what about a national picture? Luckily, the U.S. Department of Labor studied the impact of the minimum wage on youth employment; information on hiring ages in 10 cities came from this research. As out of date as that survey is, it is the only one this author has encountered on the topic.

Table 2 provides a model for the kind of information that should be updated. It shows not a universal refusal to hire people under age 20, but a substantial one.

The reason employers are not as reluctant to hire teenagers for office jobs, as indicated in the table, is likely because high schools offer classes related to typing and administrative assistance. Where students have been prepared in high school with a specific skill that is in demand, employers may hire them, since employers prefer workers who are already trained.

Fragments of evidence and information indicate that the practice of not hiring recent high school graduates and dropouts has spread and that the age of hiring for “adult type” jobs (as this author calls them) has been advancing well into the 20s. With a much larger proportion of high school graduates going to college compared with 40 or so years ago, and

² See Paul E. Barton, “Youth Employment and Career Entry,” in Seymour Wolfbein (ed.), *Labor Market Information for Youth*, Temple University School of Business Administration, 1975.

Table 2**Percentage of Establishments Not Hiring Under Age 20 for Full-time Jobs***

	Non-Office	Office
Battle Creek	76	61
Baltimore	70	66
Los Angeles	66	61
Auburn	65	49
El Paso	63	66
Atlanta	60	64
Detroit	60	46
Galveston	55	48
Milwaukee	55	51
Cleveland	48	45

* The establishments surveyed were governed by the minimum-wage law. Source: U.S. Department of Labor's study of the minimum wage law, 1969.

with trends showing that parents are supporting their children financially for a longer time, employers may consider the age of maturity to have increased.

Over the decades, the structure of the labor market became such that employers with the better-paying jobs were able to fill those positions with individuals who were older and more experienced. Labor shortages have not forced employers to dip down into the age pool.

Traditionally, people were considered adults and expected to shoulder responsibility by the time they were 17, 18, or 19 years old. The term “adolescence” originated in the 1940s.

So, are 17- to 19-year-olds less mature today than in prior decades? While everyone may have an opinion, evidence on such a nebulous concept as “maturity” is difficult to obtain.

One should not conclude from this discussion that teenage-intensive industries provide “bad” jobs per se — although their average wages are lower.³ For a great many people, those jobs are a way station; and for some, they are an end point. Statistics show that teenagers with greater educational attainment differentiate themselves from others as they age.

The task ahead is to understand what role schools can and should play in helping graduates navigate throughout the employment world. Good information is needed about what work-related experience teenagers have when they leave high school.

In the early 1980s, this author served as an advisor to the Committee for Economic Development Study that produced a major report, *Investing in Our Children*. Some of the results are reported elsewhere in this report, but one episode from the experience is especially noteworthy for the purposes of this section: At a meeting of the employers on the advisory committee, this author asked how many had hired recent high school graduates. The answer was none.

The age gap also means time remains to extend the period of preparation for the “adult-type jobs;” another year or two could be used to prepare for employment. This time could be spent strengthening skills or extending time in school and potentially, as a result, in school-employer programs that strengthen employment skills through actual experience. Such programs are beneficial all around, as they allow employers to identify academic weaknesses and then communicate them to schools; they also result in connections that can assist in the school-to-work transition.

As schools improve student employment readiness, an information program is needed to convince employers that graduates are ready for employment. The military is a visible example of how high school graduates can go immediately into positions of responsibility.

We jump from information of the early 1970s to what we learned in the mid-1990s from the NELS:88 longitudinal survey conducted by the National Center for Education Statistics. The survey started with eighth-graders in 1988 and followed those who did not drop out through graduation in 1992. NCES again surveyed the students in 1994.

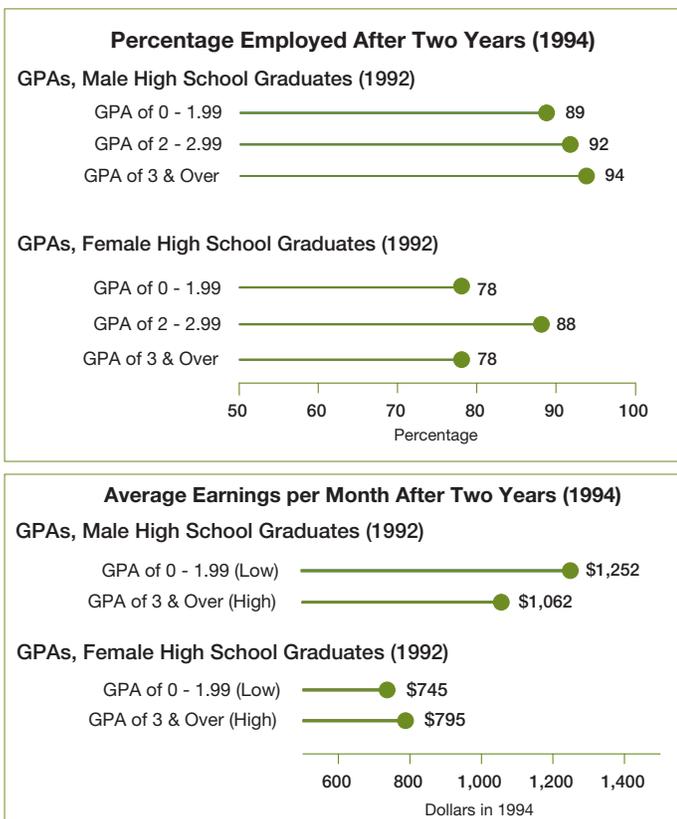
We know a lot about the students who graduated or dropped out. We know their grades in school and their test scores on the tests NELS:88 administered to this large national sample. We know about their

³ In the early 1980s, this author participated in a large study of youth fast-food jobs. Many of the youth involved had positive experiences.

post-school/labor market experiences, including their employment status and earnings.⁴ And we know which ones were not enrolled in higher education two years later — those who went directly into the labor market.

Figure 1 shows the relationship between school achievement, employment, and earnings for those students. The percent of males employed was slightly higher for those with high grades, but the differences were not statistically significant. Among females, the middle-grades group had the highest employment rate;

Figure 1
The Difference Grades Make – Employment and Earnings of Male and Female 1992 High School Graduates (not enrolled in school) Two Years After High School (1994), by Grade Point Average



Source: NELS:88 data (National Center for Education Statistics) calculated by the ETS Policy Information Center.

the groups with the highest and lowest grades had identical employment rates.

The bottom half of Figure 1 shows the differences in earnings. While it shows that male graduates with the lowest GPAs had higher average earnings than those with the highest GPAs, the difference was not statistically significant. For females, the monthly earnings were about the same. Comparisons based on reading test scores showed a similar pattern of little difference.

Differentials in labor market success do come with time. Data that show a strong relationship between educational attainment and earnings have been repeated often enough to become generally familiar. This is well-illustrated by data from the Armed Services Vocational Aptitude Battery (ASVAB) and the National Longitudinal Survey of Youth, conducted by the U.S. Bureau of Labor Statistics.

Figure 2 shows how differentiation occurs with age. Real wage rates differ little initially, irrespective of the ASVAB quartile in which the workers scored. However, after about age 22, the pay rates start to separate a bit, and those with higher scores start to receive higher pay. Commenting on the reasons, John Bishop of Cornell University offers one possibility:

...high school graduates who got higher grades or scores entered jobs that had greater training opportunities, so even though these jobs may not have paid more initially, their related training ultimately led to higher pay.

The other possibility Bishop suggests is that employers may not fully realize the skills of younger hires initially, but may over time.⁵

It is unclear whether employers end up paying more for specific academic knowledge or whether the same set of characteristics that allow people to excel in the school environment also enables them to rise to the top in employment settings. And as years go by, the higher scorers are likely migrating from teenage-intensive industries to more adult-type employment in companies with higher-paying jobs.⁶

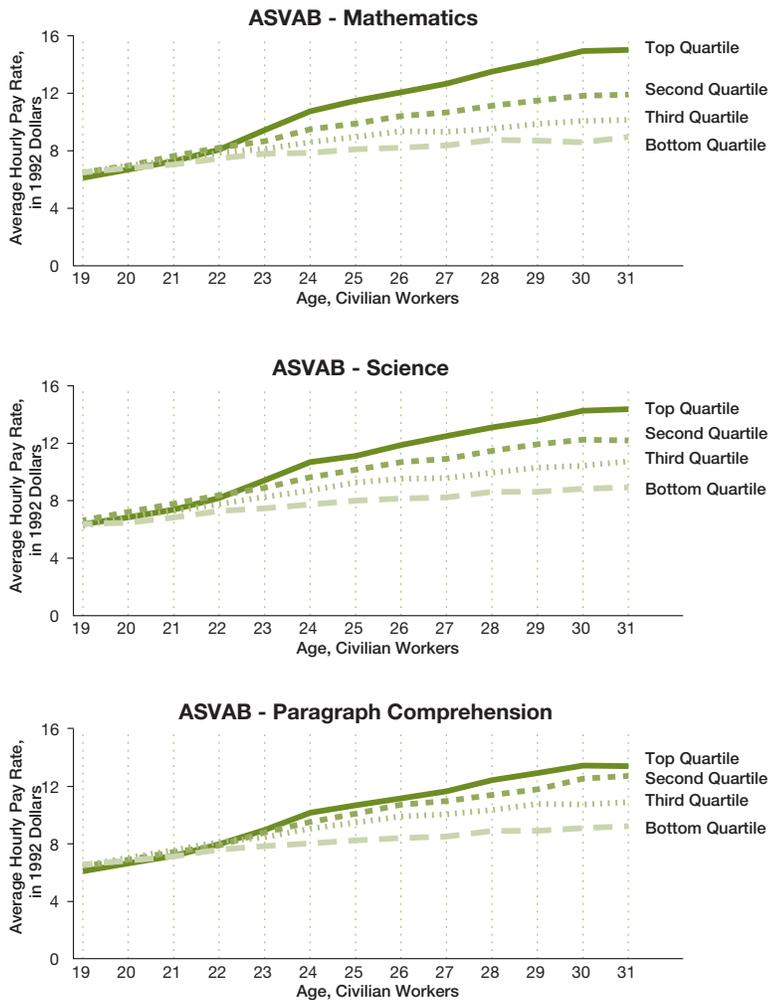
⁴ For a more complete analysis, see Paul E. Barton, "Learn More, Earn More," *ETS Policy Notes*, Vol. 9, No. 2, Summer 1999.

⁵ Barton, 1999.

⁶ This is a longitudinal survey. Also included are people who acquire more education as they get older; this segment of the population could contribute to the separation that comes in the middle 20s.

Figure 2

The Difference Age Makes – Average Hourly Rate for Civilian Workers by Age and Armed Services Vocational Aptitude Battery (ASVAB) Average Quartile



Source: U.S. Department of Labor Statistics, National Longitudinal Survey of Youth, 1973-93.
 Note: To control for differences in age at testing, individuals were assigned to age-specific quartiles for each subject, based on their age at testing.

In a 2004 poll on current considerations of high school reform, Achieve, Inc., is to be commended for including employers. While the 400 employers surveyed are drawn from many sectors of the economy, there is nothing in the public report about sampling approaches and response rates.

The employers estimated that “39 percent of recent high school graduates with no further education are unprepared for the expectations that they face in entry-level jobs.” Also, they estimate that “an even larger proportion (45 percent) are not adequately prepared with the skills and abilities they need to advance beyond entry level.”⁷

Likely for those reasons, a large proportion of employers engage in limited hiring of high school graduates who do not get a college degree. And only one in five say high school graduates represent a large proportion of those they hire. Another 38 percent say they hire a moderate proportion of high school graduates. The rest, it can be assumed, hired precious few.

It can also be presumed that the hiring of *recent* high school graduates is even more restricted, given the reluctance of some employers to hire teenagers. The American Diploma Project report lists areas in which employers typically hire recent high school graduates with no further education as labor, construction, and skilled trades and services — including food service, personal service, and cashier work. But the report doesn’t define “recent graduate” or provide the graduates’ ages.

Given the limited amount of hiring of recent high school graduates, it is hard to understand how a high proportion of employers could respond in polls about the qualifications of those high school graduates for entry level jobs or for advancement in their companies.

Unlike colleges deciding whether to admit students, employers do not typically ask for transcripts when they hire high school graduates. That alone provides insight into what employers think about school achievement.

⁷ American Diploma Project, 2004.

John Bishop pointed that out in a study he led in the early 1990s. Employers of high school graduates were not giving signals that it mattered what students studied in school or how well they did. It obviously was not important for the kinds of jobs the employers were filling.

Concern about the lack of employer interest in school achievement mounted and in the late 1990s the Business Coalition for Education Reform began urging employers to ask schools for transcripts. By May 1999, about 5,000 employers had agreed to cooperate. The National Alliance of Business led the effort, but the organization went out of business several years ago. The lack of requests for transcripts by employers is consistent with the surveys of employers who hire

high school graduates, indicating that, in general, evidence of academic achievement is not high on the list of skills and qualities that employers are looking for.

The question, then, is what does all that mean regarding how high schools should change to serve the many graduates who do not pursue further education? For a great many teenagers, the age of perceived economic adulthood is well beyond the age for which the public provides free academic preparation. What youth are really capable of, however, is a different question. For example, the military takes recent high school graduates, trains them for the jobs that need to be filled, and often puts them in positions of considerable responsibility.

From time to time, employer and other organizations directly ask employers what they are looking for when they hire and what predisposes them to turn away certain applicants. That is one window through which to gain perspective on the preparation and qualities students need to enter the workforce successfully.

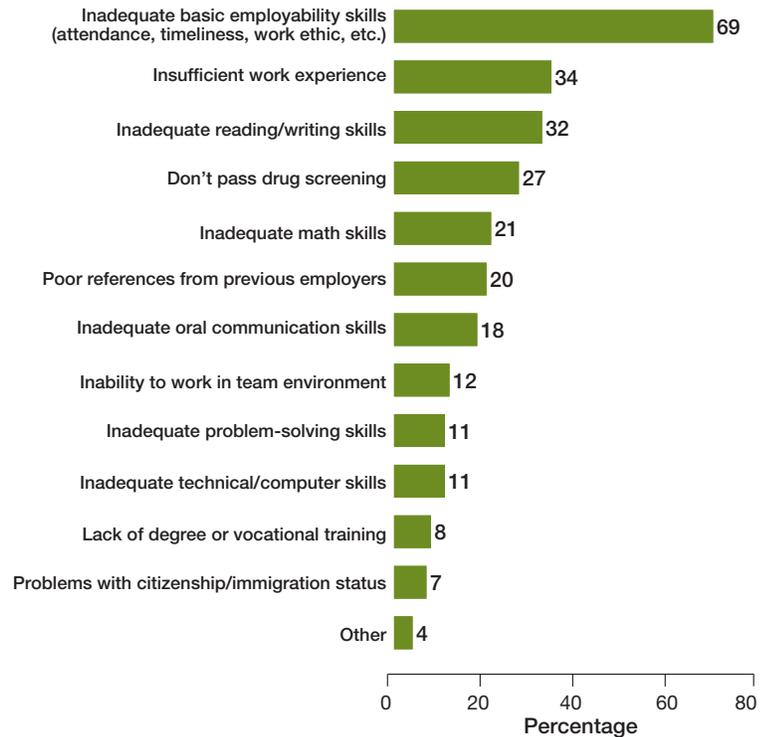
Employer surveys have somewhat varying purposes, and only some of them focus directly on those coming out of high school and entering the labor force. The questionnaires are not uniform, so it is not possible to sum them up neatly or to compare trends over time. However, perusal of the results will at least lead to a basic understanding of what employers are looking for. Seven such surveys are summarized below, with more emphasis on the recent ones.

National Association of Manufacturers (NAM), 2001. The results of a survey of NAM members were reported in *The Skills Gap 2001*. Respondents were from more than 20 industries. On education, the overall conclusion was as follows:

We continue to support educational standards and testing that provide essential goals and accountability to the educational process. We caution, however, that they should not be pursued to the point where often equally worthy elements are driven out of the curriculum. Manufacturers want well-rounded high school graduates who can read, write, calculate, solve problems, work in teams and have strong employability skills. They want graduates familiar with the world of work and with varied career and post-secondary education options. However, we urge that business/education partnerships continue and expand, with appropriate state and local supports. We urge, too, that employers support such activities, including providing internships that bring education and students into the workplace.⁸

Figure 3

Most Common Reasons Companies Reject Applicants as Hourly Production Workers



Source: National Association of Manufacturers, 2001.

Figure 3 shows the ranking of reasons given by companies for rejecting applicants as hourly production workers. By far, inadequate employability skills — attendance, timeliness, and work ethics — were most frequently cited (69 percent). These were followed by insufficient work experience (34 percent), inadequate reading and writing skills (32 percent), and failure to pass a drug screening test (27 percent). Inadequate math skills ranked fifth, with poor references from previous employers following. Oral communications, problem solving, and technical and computer skills were sometimes cited. Previous satisfactory experience is always high on employers' lists, and employability skills almost always top the list.

Educational Quality of the Workforce National Employer Survey, 1995. The National Center on the Educational Quality of the Workforce at the University

⁸ National Association of Manufacturers, *The Skills Gap 2001*, 2001.

of Pennsylvania designed this survey, the Bureau of the Census administered it, and the U.S. Department of Education funded it.⁹ It is a broad survey that asks, among many other questions, “When you consider hiring a new non-supervisory or production worker (front-line worker), how important are the following in your decision to hire?” Respondents ranked reasons on a scale of 1 to 5, with 1 meaning “not important” and 5 meaning “very important.”

With 75 percent of interviews completed in the manufacturing sector and 69 percent completed in the non-manufacturing sector, the survey is probably of the highest quality of any survey available on the subject, in terms of sample quality and response rate. The results are shown in Figure 4.

The chart reflects feedback on making hiring decisions about front-line workers generally, and was not limited to hiring recent graduates or young workers. The same factors appear to be valued by employers, regardless of applicant age.

At the top of the list are attitudes and communications skills. The next three factors show how much prior experience and recommendations mean to employers. Factors directly related to schooling appear in the lowest third of the list, although it is possible that they play a larger role when employers consider younger workers.

Department of Education Survey of 101 Executives, 1988. This survey focused on executives from small- and medium-size firms. According to the report:

- “The definition of basic skills typically used by employers includes not only the ability to read and write but also computation, communication, and problem solving skills.”
- “Business leaders also believe that schools should emphasize the importance of good habits such as self-discipline, reliability, perseverance, accepting responsibility, and respect for the rights of others.”¹⁰

The Committee for Economic Development Survey of Employer Needs, 1984. The CED surveyed a random sample of Fortune 500 companies as well as 6,000 small companies.

Figure 4

Importance of Applicant Characteristics for Hiring Front-Line Workers



Source: National Center on the Educational Quality of the Workforce National Employer Survey, 1995.

- The large companies ranked as most desirable the characteristics of “striving to work well,” “learning how to learn,” “priority setting,” and “communicating.” The small company rankings were similar, except that their fourth-ranked characteristic was “working well with others.”
- Respondents from both groups indicated that the most desirable characteristics were difficult to find in young applicants.¹¹

Conference Board Survey of Executives, 1984. The Conference Board surveyed public affairs and training/personnel executives. Also, a more in-depth telephone survey reached 100 employers. The survey found:

⁹ Findings from the National Center on the Educational Quality of the Workforce National Employer Survey, 1995.

¹⁰ U.S. Department of Education and U.S. Department of Labor, *The Bottom Line: Basic Skills in the Workplace*, 1988.

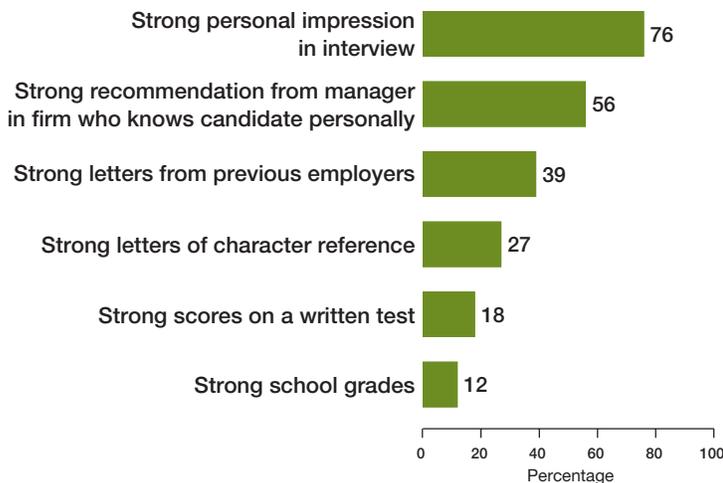
¹¹ Committee for Economic Development, *Investing in Our Children: Business and the Public Schools*, 1985.

- Employers were concerned with the observed inability of high school graduates to function effectively as communicators.
- Attitudes toward work and the workplace were a primary problem for the employers.
- *The large firms reported hiring few recent high school graduates.* The report says that people ages 17 to 20 tend to find their first employment with the nation's 650,000 small businesses or in franchise organizations.¹²

Survey of Personnel Officers, Center for Social Organization of Schools, The Johns Hopkins University, 1984. For this study, the Center interviewed a sample of employers who had hired high school graduates who were tracked in the third and fourth follow-ups of the National Longitudinal Study of 20,000 high school seniors. What those employers considered “very important” to their hiring decisions are shown in Figure 5. Particularly noteworthy is that academic factors ranked among the lowest.¹³

Figure 5

Factors That Employers Considered “Very Important” in Hiring Decisions for High School Graduates



Robert L. Crain, *The Quality of American High School Graduates: What Personnel Officers Say and Do About It*, The Johns Hopkins University, May 1984.

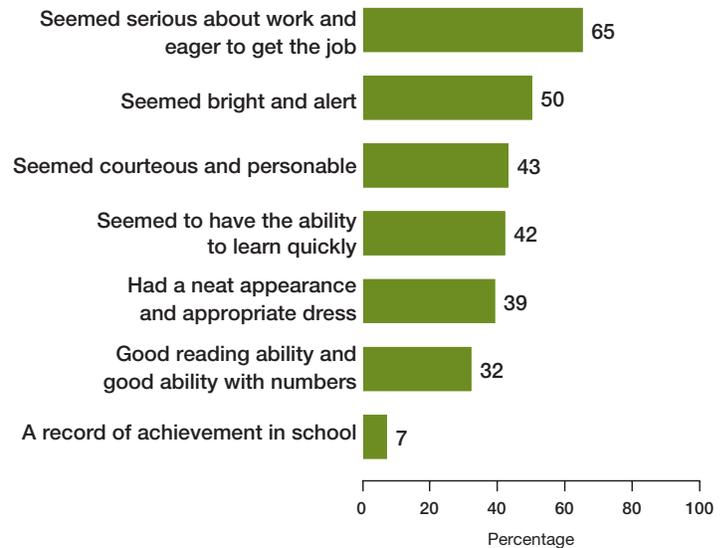
¹² Leonard Lund and E. Patrick McGuire, the Conference Board, 1984.

¹³ Robert L. Crain, *The Quality of American High School Graduates: What Personnel Officers Say and Do About It*, The Johns Hopkins University, May 1984.

¹⁴ Paul E. Barton, *Skills Employers Need: Time to Measure Them?*, Policy Information Center, Educational Testing Service 1990, p. 4.

Figure 6

Factors Employers Considered Most Important in Young Entry-Level Applicants



Paul E. Barton, *Skills Employers Need: Time to Measure Them?*, Policy Information Center, Educational Testing Service 1990, p. 4.

San Francisco Employers, 1983. This survey asked employers in San Francisco which characteristics they were looking for in entry-level applicants, specifically. While the survey covers just one city, it is directed at the hiring of young new entrants to the job market. Their responses are shown in Figure 6.¹⁴

* * * * *

In general, the surveys — which span almost two decades — show a lot of commonality on what is important to employers: attitude, first impressions, and recommendations.

Each survey of what employers consider important when they hire could be criticized on one basis or another, and not all of the surveys are directed specifically at people who recently left school. Response rates are obviously important, but are frequently low on surveys, unless the U.S. Census Bureau or a strong survey research organization conducts them. For example, the NAM study obtained responses from just 600 of the 6,000 members it pursued.

Table 3**What New Workers in Entry Level Jobs Need to Be Able to Do**

Communication Skills	Interpersonal Skills	Decision-Making Skills	Lifelong Learning Skills
Speak so others can understand	Cooperate with others	Use math to solve problems	Take responsibility for learning
Listen actively	Resolve conflict and negotiate	Solve problems and make decisions	Use information and communications technology
Read with understanding			
Observe critically			

Source: Equipped for the Future Work Readiness credential (http://eff.cls.utk.edu/workreadiness/work_readiness.htm)

The overall picture, however, is clear enough. Employers emphasize a set of employability skills that are sometimes referred to as “soft skills.” Citing his research along with the research of Richard Murnane and Frank Levy, James Rosenbaum of Northwestern University found that “although soft skills are often employers’ highest priority, they are rarely taught in high schools or colleges.”¹⁵

Employers also heavily weigh previous experience and recommendations — something a young person who leaves high school may not have. Considering that school achievement is listed low among the factors that employers consider important for hiring, there is little reason to believe that the employers surveyed are looking for advanced academic skills. Researcher Anthony Carnevale puts it this way: “Students who do best in high school also do best on the job, but the match between the academic content in high school and the subsequent knowledge required on the job is not significant.”¹⁶

When considering these employer preferences, it is important to keep in mind the discussion in this report about the age of hiring. Large employers and employers offering adult-type jobs with fringe benefits and job-advancement opportunities generally defer hiring until the potential employees are in their mid-20s — for both high school and college graduates.

The surveys highlighted in this section cover two decades. But what is striking is the degree of similarity in ranking among employer priorities over the period.

If we are serious about recognizing employer needs, we ought to bring that work up-to-date with a new survey.

Donna Desrochers, vice president of the Committee for Economic Development, adds that prospective workers who impress employers with their non-cognitive skills may then be required to meet a requirement for the necessary academic skills for the job.¹⁷ This author believes future surveys should consider and explore that possibility.

The longstanding views of employers as to what they look for in entry workers have coalesced in a major project initiated by the U.S. Chamber of Commerce’s Center of Workforce Preparation, in partnership with five states.¹⁸ They are developing, field testing, and validating “The Equipped for the Future Work Readiness Credential,” a portable and nationally valid assessment scheduled for release in June 2006. The WRC is based on a cross-industry standard, defined by experts from multiple business sectors, for what entry-level workers need to be able to do to be fully competent (see U.S. Chamber of Commerce Web site).

The four categories of skills of “What New Workers in Entry Level Jobs Need To Be Able To Do” are shown in Table 3.

This major new project in the business community should go far in helping the high school reform movement make changes that will help prepare students to enter the work world.

¹⁵ James Rosenbaum, *Educational Opportunity in American Society: A Research Agenda for Studying Transitions*, Learning Point Associates, a paper given at the Institute of Education Science Conference on Research for Improving High Schools, May 5, 2005.

¹⁶ Anthony Carnevale, *Connecting the Dots Between High School, College, and Careers*, Learning Point Associates, a paper given at the Institute of Education Science Conference on Research for Improving High Schools, May 5, 2005.

¹⁷ Personal correspondence, December 2005.

¹⁸ The contractors for the technical work are SRI International, HumRRO, the BMC, Inc., Center for Literacy Studies, University of Tennessee, and WestEd.

Educational Attainment and Job Requirements

Learning about the education requirements of jobs, understanding how the requirements have changed over time, and predicting future trends are daunting tasks. The activity is a bit like a blindfolded person trying to describe an elephant after touching only part of it.

This section of the report examines the occupational landscape and how it is changing; how the content that is necessary to master before entering an occupation might be changing; the generally rising education levels of those employed over the past few decades, along with what this trend may or may not mean; the difference it makes to look at job openings rather than at average annual employment; and job projections.

The Occupational Structure. A typical — though very limited — approach to determining changes in the occupational structure is to list 10 or 20 of the fastest-growing occupations in terms of average employment. A large proportion of such occupations tend to require advanced education. People look at that information and conclude education requirements are advancing rapidly. Further, the growing occupations are sometimes contrasted with occupations showing the steepest rates of decline; those, in turn, generally reflect a high proportion of jobs that require less academic preparation.

A major limitation of looking at the rate of growth is that the fastest-growing jobs tend to have relatively few people in them, so a high percentage increase can result in a relatively small number of new jobs. And, as we will see later, the use of counts of “average employment” is limited in forecasting hiring opportunities.

This fastest-growing-jobs approach to occupational structure (measured as the percentage increase) is reflected in *Workforce 2000*, a bestseller published in 1987, and its sequel, *Workforce 2020*, published in 1997. But how do such changes in that kind of growth affect the total of all jobs? What is happening in the

occupations with large numbers of jobs? *Workforce 2000* said the education requirements for all jobs were provided in the appendix — but there was no appendix. This author ultimately requested and received the information, which shows that the average educational requirements for *all* jobs in 1984 is exactly the same as the average for *all* jobs in the projections for 2000. The sequel tells a similar story, but it does not summarize changes in the average requirements for all jobs.¹⁹

In *What Jobs Require: Literacy, Education, and Training, 1940-2006*, this author married several bodies of data to show the prose, document, and quantitative literacy requirements for most census occupations and then compared 1996 data with projections for 2006 to get a more comprehensive picture.²⁰ Again, the occupations most rapidly increasing, in terms of percentages, required higher literacy levels. However, once again, the numbers involved were so small that there was no impact on the total situation: The average literacy requirements for all jobs combined were the same for 1996 as for the U.S. Bureau of Labor Statistics’ (BLS) projected occupations for 2006.²¹

What Jobs Require drew on all related studies this author could find for the post-World War II period and concluded that there likely had been a very gradual rise in education levels needed to perform the available jobs over that period of time, based on changes in the occupational structure.

The Changing Content of Occupations. Work done regarding the extent of shifts in the occupational structure is relatively straightforward. It would tell a fairly complete story if the content of individual occupations — meaning the nature of skills and abilities required — remained reasonably constant. But that is not the case.

¹⁹ William Johnston and Arnold Packer, *Workforce 2000: Work and Workers for the Twenty-First Century*, Hudson Institute, 1987; and its sequel, Richard W. Judy, Carol D’Amico, and Gary L. Geipel, *Workforce 2020: Work and Workers in the Twenty-first Century*, Hudson Institute, 1997. The unpublished technical appendix was by Matthew Joffe, December 1987. Table 17 shows the average GED language requirement at 3.1 for 1984 and at 3.2 for projected occupations in 2000.

²⁰ Published by the Policy Information Center, Educational Testing Service, 1999. The report can be downloaded from <http://www.ets.org/Media/Research/pdf/PICJOBS.pdf>.

²¹ In personal correspondence, December 2005, Donna Desrochers points out that “new jobs tend to represent less than 15 percent of job increases over 10 years — therefore, it is not surprising that the average literacy level changes little over a decade.”

How much have changes *within* the occupational titles changed the quantity or type of education and skills requirements? That is a hard question, for which there is really no answer, at least in measurement terms. There are people who know some occupations well and who have a good notion of such changes, but what they know has not likely made it into print and circulation, so the information is not available to educators and policymakers. Studies are available from time to time on a very limited number of occupations, but those studies are not able to offer conclusions about trends over time for a large segment of the labor market.

An example of some good work is that of Peter Cappelli at the University of Pennsylvania in 1992. The focus was on production and clerical jobs. His analysis was possible thanks to Hay Associates, the world's largest compensation consulting firm. To establish what various employers are paying for work of identical content, Hay collects data on jobs and their characteristics that allow an assessment of skill changes made over time.

The production jobs examined by Cappelli were those typically found only in large manufacturing operations. Cappelli's report concludes that some upskilling was taking place in those jobs. In the case of clerical jobs, which varied in nature, "half the jobs experienced upskilling and half had significant deskilling."²²

Public opinion often contends that a great many jobs are becoming more complex because of technological changes. But the reality is that advances in technology work both to upskill jobs and to deskill them. Sometimes changes eliminate the need for low-skill labor, and the jobs that replace them call for higher technical skills or more responsibility, with a likelihood that there are fewer of the new jobs than the old ones — the economic imperative behind the development of the technology. In such cases, the new jobs are likely given different occupational titles than the old ones.

Other changes occur within an occupation that alter the skills needed for the work. Tool and die makers had to switch to computer-aided design, which if nothing else, required retraining. On the opposite end, consider how advances in the retail industry have resulted in deskilling workers. As a kid working in the corner drugstore, this author used paper and pencil to compute the price of the items being purchased, then applied a 3 percent sales tax. Sales had to be separated into several drawers in the cash register, depending on the category of merchandise. Nowadays, the items are scanned, a clerk enters the amount the customer gave him or her, presses a key, and the computer reports the amount of change to give to the customer. If the item is on sale, the computer knows that, too.

So technological change works both ways, and this author is not aware that anyone has ever netted it out for the job market as a whole. Doing so is likely impossible.²³

Although difficult, efforts should be made to obtain more information on educational requirements to inform education and training policymakers. This would require a large, sustained effort.²⁴ But, as noted by Anthony Carnevale at a research planning meeting convened by the Department of Education's Institute of Educational Sciences on May 5, 2005, it is quite possible that some good information could come from the Department of Labor's O*Net computerized database — the replacement for the Dictionary of Occupational Titles that marries Department of Labor occupational codes with census occupational classifications. The possibility is worth a close look, as was pointed out. That database might help in understanding job content and requirements, but it will yield change information only when the job analyses are repeated — and those are done very infrequently.

Rising Education Levels. It is well-known that the average number of years of school completed has risen in the United States. That was true when this author looked at trends in the 1970s; and in each decade

²² Peter Cappelli, *Are Skill Requirements Rising?*, University of Pennsylvania, National Center on the Educational Quality of the Workforce, 1992.

²³ I have focused here on content changes resulting from technology, but jobs may be restructured for a variety of reasons.

²⁴ Where there is local career and technical instruction in schools and community colleges, instructional staff and industry experts can interact to bring instruction and requirements together.

thereafter, the average educational level of those in any given occupation advanced — even those clearly not requiring additional education, such as waiters and waitresses. One way to tell the story of changing job requirements is simply to look at the proportion of employees who have gone to college. That proportion has been increasing, and now about six in ten people employed have some college or a college degree.²⁵

While there has been a steady increase in high school graduates entering college, there also has been a steady rise in non-completers and in the number of people who have college credits but not a two- or four-year degree. When we see that more employees have some college, should we conclude that the jobs they are in *required* the knowledge the employee learned in school? This is an assumption commonly made by those who assert that education requirements for work are advancing rapidly. However, who gets hired is determined by an interaction of supply and demand. In deep recessions, news stories reported that people with Ph.D.s were driving taxicabs. No one would conclude, however, that a Ph.D. is needed for a person to drive a taxicab.

Similarly, we know that not all four-year college graduates land jobs that require a college degree. Four years after receiving a bachelor's degree, 40 percent of those not enrolled in graduate education say they are employed in a job where a college degree "is not required."²⁶ No comparable information is available for those with some college.

Research findings are mixed on the economic returns of going to college but not earning a degree.²⁷ In 2001, using national data, the National Center for Education Statistics published *Credits and Attainment: The Returns to Postsecondary Education Ten Years After High School*. Researchers examined 16 student characteristics and their association with earnings. The object was to see by how much college credits and degrees result in higher earnings, after controlling for other factors taken into consideration when employers hire.

The findings for two- and four-year degrees were clear and positive. However, "after controlling for multiple aspects of student experience and background, the economic returns of some college credits apart from degree completion were negligible, irrespective of the number of credits completed."²⁸ Other studies in the 1990s found that people benefited from one year of course work.

People who go on to college but do not graduate likely possess, on average, a greater number of qualities or characteristics that employers value than those who do not enter college. That said, even if they had not gone to college, they likely would have done better in the labor market than those who did not enter college at all. If the college non-completers had remained high school graduates, there likely would have been less of an absolute and relative decline in the earnings of high school graduates. Economists should not rely on the "wage premium" to judge changes in job requirements and need to consider more than just changes in wage differentials when judging changes in job requirements. In the case of this NCEES analysis, using a large data base, there is no wage premium in favor of people with just some college over high school graduates, after controlling for other characteristics desirable to employers.

Also problematic is the use of "average annual employment." All the analyses this author has seen, except for that of the U.S. Bureau of Labor Statistics (BLS), use this kind of data, comparing the average employment in an occupation with the average projected employment for that occupation ten years out, or farther. The percentage increase is represented as the increase in employment in that occupation, as a means of informing people about which occupations will exhibit strong growth and present the most opportunity over a ten-year period, or of informing policymakers about whether educational requirements are advancing. But people do not apply for an average job, they apply for a specific job.

²⁵ See Anthony Carnevale and Donna Desrochers, *Standards for What? The Economic Roots of K-16 Reform*, Educational Testing Service, 2003, p. 19.

²⁶ Laura J. Horn, Lisa Zahn, and Dennis Carroll, *From Bachelor's Degree to Work*, National Center for Education Statistics, NCEES 2001-165, February 2001.

²⁷ For a short summary of this research, see Paul E. Barton, *The Closing of the Education Frontier?*, Policy Information Report, Policy Information Center, Educational Testing Service 2002, p. 20.

²⁸ Brian Zucker and Royal Dawson, *Credits and Attainment: Returns to Postsecondary Education Ten Years After High School*, National Center for Education Statistics, NCEES 2001-168, March 2001, page iv.

Changes in job openings are the result of two potential forces: growth or decline in a particular “job slot” and turnover among people occupying those job slots. Considering the impact of turnover, projections limited to average annual employment can be highly misleading if used to either counsel a student about future employment opportunities or to set education and training policy.

Turnover is tricky because not only is it an important factor in job projections, but it varies considerably among occupations. One element is the age of people in the occupation. For example, fields that started to thrive as baby boomers entered the market are now likely facing high levels of turnover, as that segment of the population nears retirement. Even if the actual number of job slots is not increasing, there will soon be surges of job openings in those fields.

Stability in occupations varies for a number of reasons. A tenured professor may have high job security. A doctor may remain unaffected by shifts in the economy. Generally, people are becoming increasingly less attached to their employing organization and are changing jobs more frequently (at least in some sectors of the economy over the post-World War II period). For some people, stability and long tenure are sought; others expect — or simply are forced — to move around as opportunities come and go.

BLS has long made projections by occupation, both for average employment in an occupation and for job openings, taking into account both growth and turnover. And it has long indicated the “most significant” sources of preparation for jobs, ranging anywhere from short-term on-the-job training to a bachelor’s degree or beyond.

Over the years, the BLS analysis has become more complete and useful. It ranks occupations by median earnings, unemployment levels suffered, and the extent of part-time employment. It also shows the distribution of educational attainment for each occupation, providing for 25- to 44-year-olds the percent-

age with high school or less,²⁹ some college, or college completion — what BLS calls “education attainment clusters.”

Job Openings and Education Clusters. The BLS report analyzes about 750 occupations — a huge undertaking. But there is no way to obtain a bird’s-eye view of 750 occupations. Table 4 shows the 44 occupations BLS rated as having a high or very high number of annual *job openings* between 2002 and 2012. The table shows the most significant source of education and training for the job, the median earnings for the job in 2002, the distribution of educational attainment in the job, and the estimated quantitative literacy required in that job.

The 44 occupations shown in Table 4 accounted for exactly half of the 26 million average annual job openings. A look at these occupations provides a useful orientation to the U.S. occupational structure and the nature of job openings over a decade.

The table shows that few occupations are monolithic with respect to the education level of the people who occupy them. For example, customer service representatives had differing educational levels: 38 percent had high school or less, 40 percent had some college, and 21 percent had a college diploma.³⁰

Eight of the occupations listed offered jobs with education requirements that spanned the spectrum. This is especially significant considering that those occupations create an average of 2.7 million job openings each year — more than 10 percent of all openings. Those are the actual educational attainments of people employed in the occupation, not the results of a job analysis done to determine the level of education required by the occupation.³¹

Most occupations are more homogeneous in that regard. Eighty-three percent of hand packers and packagers have attained a high school diploma or less. At the other end of the spectrum, 74 percent of accountants and auditors have completed college.

²⁹ In the “high school education” cluster, BLS does not separate high school dropouts and graduates.

³⁰ Bear in mind that looking at such things as the extent of variation in worker characteristics is somewhat the artifact of the occupational classification system itself. The aim is to identify a work activity where all who perform it are doing basically the same thing. However, some occupational titles will encompass more variation than others, leading to more variation in education and pay. And of course, how broad the occupation is helps determine how many workers are included in it. The number in the occupations includes both full- and part-time workers; the BLS data indicate those occupations with a high proportion of part-time workers.

³¹ It should be noted that studies show that within the same occupation, workers with more education tend to earn more.

Table 4**Occupations With Highest Number of Openings, 2001-2012, With Education/Training Characteristics**

Occupation	Average Jobs Open Per Year (000)	Most Significant Source of Education and Training	Median Annual Earnings, 2002	Percentage of Workers Age 25 to 44 by Educational Attainment*			Quantitative Literacy Required
				High School or Less	Some College	College or Higher	
High School Education Cluster							
Food Preparation Workers	292	Short-Term OJT#	16,330	77	18	5	255
Fast Food & Counter, Preparation & Serving	813	Short-Term OJT	14,500	77	18	5	257
Maids and Housecleaners	367	Short-Term OJT	16,440	82	14	5	237
Janitors and Cleaners	492	Short-Term OJT	18,250	79	17	4	257
Landscape & Groundskeeping	223	Short-Term OJT	19,770	77	18	6	267
Farm, Laborers, Crop, Nursery & Greenhouse	145	Short-Term OJT	15,070	84	12	5	267
Construction Laborers	177	Short-Term OJT	24,740	80	16	5	268
Helpers-Production Workers	139	Short-Term OJT	19,240	77	17	5	NA
Packers & Packers, Hand	211	Short-Term OJT	16,700	83	13	4	261
Total	2,859						
High School/Some College Cluster							
Agricultural Managers, Farm & Ranch	106	Long-Term OJT	24,076	55	29	17	NA
Teaching Assistants	286	Short-Term OJT	18,660	44	40	16	276
Home Health Aides	8	Short-Term OJT	18,090	63	31	6	234
Nursing Aides, Orderlies, Attendants	336	Short-Term OJT	19,960	63	31	6	244
Security Guards	259	Short-Term OJT	19,140	53	35	13	213
Firstline Supervisors of Food Preparation & Serving	166	Related Work	24,390	56	30	14	255
Hosts and Hostesses, Restaurant	103	Short-Term OJT	14,150	55	32	13	278
Child Care Workers	429	Short-Term OJT	16,350	53	34	13	255
Personal and Home Care Aides	181	Short-Term OJT	16,250	60	32	9	NA
Bookkeeping, Accounting, Clerks, Auditing	278	Mod-Term OJT	27,380	40	44	16	303
Receptionists & Information Clerks	335	Short-Term OJT	21,150	50	39	12	292
Carpenters	202	Long-Term OJT	34,190	73	22	5	287
Maintenance & Repair Workers, General	166	Mod-Term OJT	29,370	57	35	9	292
Team Assemblers	141	Mod-Term OJT	22,680	74	21	5	269
Truck Drivers, Heavy & Tractor Trailer	324	Mod-Term OJT	33,210	71	24	5	277
Truck Drivers, Light or Delivery	241	Short-Term OJT	23,870	61	26	13	277

* This is the actual attainment of workers in the occupation. # On-the-job training

Table 4 (Continued)**Occupations With Highest Number of Openings, 2001-2012, With Education/Training Characteristics**

Occupation	Average Jobs Open Per Year (000)	Most Significant Source of Education and Training	Median Annual Earnings, 2002	Percentage of Workers Age 25 to 44 by Educational Attainment*			Quantitative Literacy Required
				High School or Less	Some College	College or Higher	
Cashiers, Except Gaming	1,299	Short-Term OJT	15,420	66	26	8	278
Stock Clerks & Order Fillers	409	Short-Term OJT	19,270	65	26	9	265
Executive Secretaries and Administrative Assistants	218	Mod-Term OJT	33,410	37	47	16	293
Secretaries, Except Legal, Medical & Executive	251	Mod-Term OJT	25,290	37	47	16	303
Office Clerks, General	577	Short-Term OJT	22,280	41	42	17	295
Waiters & Waitresses	781	Short-Term OJT	14,150	55	32	13	271
Total	7,256						
High School/SomeCollege/College Cluster							
General & Operations Managers	280	Bachelor+Exp	68,210	21	30	48	330
Firstline Supervisors, Retail Sales Workers	262	Related Work	29,700	41	34	25	298
Counter and Retail Clerks	161	Short-Term OJT	17,280	49	28	23	247
Retail Salespersons	1,084	Short-Term OJT	17,770	42	33	25	295
Sales Representatives, Wholesale & Manufacturing, Except Technical	173	Mod-Term OJT	42,730	25	27	49	294
Firstline Supervisors, Office and Administrative Support	144	Related Work	38,820	33	40	27	301
Customer Service Representatives	465	Mod-Term OJT	26,240	38	40	21	292
All Other Managers	142	Related Work	66,890	25	27	48	326
Total	2,711						
Some College/College Cluster							
Business Operations Specialists (All Others)	181	Bachelors	50,680	16	29	56	NA
Other Teachers, Primary, Secondary, & Adult	146	Bachelors	29,250	14	30	55	316
Registered Nurses	236	Associate	48,090	2	40	58	306
Total	563						
College Cluster							
Accountants, Auditors	128	Bachelors	50,680	7	20	74	341
Postsecondary Teachers	245	Doctorate	49,090	3	7	90	NA
Middle School Teachers, Except Special & Vocational	196	Bachelors	41,820	3	5	92	333
Total	569						

* This is the actual attainment of workers in the occupation. # On-the-job training

Source: U.S. Bureau of Labor Statistics, *Occupational Projections 2002-2012*, Chapter III, Table 111-1. The last column on quantitative literacy is from Paul E. Barton, *What Jobs Require: Literacy, Education, and Training, 1940-2006*, Policy Information Report, Policy Information Center, Educational Testing Service, January 2000.

While the BLS data show median incomes of occupations, in reality there are likely considerable differences in income distribution. The basic point is that most occupations include jobs of varying levels.

Educational requirements vary in different labor markets, often reflecting how tight the local labor market is. And characteristics of the available labor supply vary by different educational choices made by employees within it and by the perceptions of opportunities available that shape personal decisions about preparation. Also, choices to prepare for particular occupations are made on both good and bad information about the nature of present and future demand. A complex set of market dynamics interacts with a multitude of individual choices and educational opportunities. Oversimplification simply leads to bad policy.

What is also striking in BLS's picture of half of all projected job openings is that so many of them are learned through on-the-job training. As used by BLS, "short-term" means one month or less of on-the-job experience and informal training. Moderate-term means from 1 to 12 months, and long-term means more than 12 months of combined work experience and formal classroom training. About half of the occupations shown in the table require only short-term on-the-job training and an additional seven require moderate-term on-the-job training.

Generally speaking, the lower the education levels, the lower the earnings. But there is large variation within clusters. For example, food-preparation workers earn a lot less than construction laborers. Also, many occupations in the high school/some college cluster have earnings similar to those in the high school cluster.³² Further, among people with the same level of educational attainment, a wide distribution exists regarding how much they earn.

Job Openings and Quantitative Literacy. Work done for a previous publication is drawn upon to show the estimated quantitative level of literacy required for occupations in the BLS table. The estimates were made using a combination of the National Adult Literacy Survey (NALS) conducted in 1992, data stemming from the Position Analysis Questionnaire

for 2,200 occupations, and the Bureau of Labor Statistics' Employment Projections.³³

The quantitative literacy estimates derive from the NALS survey, which had 26,000 respondents. Quantitative literacy involves the knowledge and skills required to apply arithmetic operations, either alone or sequentially, using numbers embedded in printed materials; for example, balancing a checkbook, calculating a tip, completing an order form, or determining an amount of interest from a loan investment. The assessment is scored on a scale from 0 to 500, with the scores further assigned to five levels, shown below.

Level 1 – Scores from 0 to 225. A typical task someone at this level would likely be able to perform is totaling a bank deposit slip.

Level 2 – Scores from 226 to 275. This includes calculating postage fees for certified mail or totaling the cost of a purchase from an order form.

Level 3 – Scores from 276 to 325. Tasks at this level include calculating the difference between the regular and sales price of an item in an advertisement and determining the discount from an oil bill if paid within 30 days.

Level 4 – Scores from 326 to 375. Tasks include using an eligibility pamphlet to calculate how much money a couple would receive for basic supplemental security income for one year.

Level 5 – Scores of 376 and above. This level includes tasks such as using a calculator to figure the total cost of carpet for a room or using information in a news article to calculate the difference in times for completing a race.

Full definitions of these levels appear in *What Jobs Require*, as do scores for most occupations. For 40 occupations in Table 4, the quantitative score is shown. Since *What Jobs Require* was published, the occupational classification system has changed; so 15 occupations are replaced by the best match, but an additional four could not be matched. Matched occupations are shown in the Appendix.

³² Confounding such earnings comparisons is that some occupations have many more part-time employees than others; these are not separated in the BLS analysis, although BLS does rank them on this factor.

³³ Barton, 2000 (particularly the Introduction and Appendix B on Methodology).

None of the occupations with the highest number of job openings are in Level 1 or 5. Seventeen are in Level 2, and 19 are in Level 3. Only four are in Level 4. All of the jobs in the high school cluster are in Level 2. Seven of the jobs in the high school/some college cluster are in Level 2, and five are in Level 3. All of the jobs except two in the high school/some college/college cluster are in Level 3; one is in Level 2, and one is in Level 4. The some college/college jobs are in Level 3, and the college jobs are in Level 4.

Each reader can look at the levels and make judgments about the degree of quantitative ability they require or go to *What Jobs Require* for more detail on the levels (prose, document, and quantitative literacy requirements for most all occupations can be found there). A considerable quantitative ability begins at Level 4, and that is by no stretch rocket-science mathematics. A more complete description of what people at Level 4 can do, for example, is as follows:

Individuals at this level have little difficulty performing two or more arithmetic operations in a sequence. They can also perform single arithmetic operations in which the quantities are found in different types of displays, or in which the operations must be inferred from the information given or from prior knowledge.

Comparable information is available for prose literacy and document literacy. The literacy levels do not translate into grade equivalents — at least not in any way this author considers valid or useful. At any of the levels, there is a wide range of years of school completed and degrees acquired. And there is huge overlap in the distribution of educational attainment among the different literacy levels. Extensive analysis by labor economist Andrew Sum at Northeastern University has shown that literacy as measured by the National Adult Literacy Survey is closely correlated with earnings.

So far, this report has addressed the education levels, skills, and personal requirements of jobs that high school graduates can enter. The discussion would not

be complete, however, without addressing the situation of companies that have jobs with lower requirements, but that also have jobs with higher requirements and established career ladders. Employers in such companies may consider the lower-level jobs “screening jobs” and may demand higher qualifications than necessary, expecting to recruit from the lower rungs into higher-level jobs. James Rosenbaum has summarized past research on “internal labor markets” and described how they work in *Beyond College for All*, a book valuable for understanding this complex way of entering the labor market.³⁴

The New Basics and Middle-Class Wages. In a chapter on “Skills for a Middle-Class Wage,” Richard Murnane and Frank Levy examine and report on the hiring requirements of several companies that have high selection standards and pay good wages with fringe benefits. The authors found that a ninth-grade level of reading and mathematics was a threshold to cross to secure jobs paying a middle-class wage. Beyond this, the authors found that a set of “soft skills” made the difference; those skills were not highly correlated with paper-and-pencil tests, such as IQ tests or the General Aptitude Test Battery (GATB) then used by the U.S. Employment Service. A validation study of recruiting methods used by Diamond-Starr Honda reports that once a required threshold was reached on the GATB, “the margin by which scores were above the threshold had almost no relationship to job performance.”³⁵

Of course, it is hard to know specifically what is meant by ninth-grade ability. A wide range of achievement among students in a single grade is found by the National Assessment of Educational Progress (NAEP). However, we can get some information from NAEP, which sets achievement levels at the fourth, eighth, and twelfth grades. The definition of *proficient* in eighth-grade mathematics describes a considerable level of mathematical ability; this level is set at a scale score of 299 on NAEP’s 0 to 500 scale:³⁶

³⁴ James E. Rosenbaum, *Beyond College for All: Career Paths for the Forgotten Half*, Russell Sage Foundation, 2001, pp. 117-119.

³⁵ Richard J. Murnane and Frank Levy, *Teaching the New Basic Skills: Principles for Educating Children to Thrive in a Changing Economy*, the Free Press, 1996. For a comprehensive text on the skills needed in the workplace, see Anthony P. Carnevale, Leila J. Garner, and Ann S. Meltzer, *Work Place Basics: The Essential Skills Employers Want*, Jossey-Bass Publishers, 1990.

³⁶ James B. Braswell et al., *The Nation’s Report Card: Mathematics 2000*, National Center for Education Statistics, August 2001, p. 11.

Eighth-grade students performing at the *proficient* level should apply mathematical concepts and procedures consistently to complex problems in the five NAEP content strands. Eighth graders performing at the *proficient* level should be able to conjecture, defend their ideas, and give supporting examples. They should understand the connections among fractions, percents, decimals, and other mathematical topics such as algebra and functions. Students at this level are expected to have a thorough understanding of basic level arithmetic operations — an understanding sufficient for problem solving in practical situations.

Quantity and spatial relationships in problem solving and reasoning should be familiar to them, and they should be able to convey underlying reasoning skills beyond the level of arithmetic. They should be able to compare and contrast mathematical ideas and generate their own examples. These students should make inferences from data and graphs; apply properties of informal geometry; and accurately use the tools of technology. Students at this level should understand the process of gathering and organizing data and be able to calculate, evaluate, and communicate results within the domain of statistics and probability.

In 2003, just 29 percent of eighth-graders were at or above this proficiency level; 68 percent reached the lower, *basic* level. How many 12th-graders reach the *proficient* level set for eighth-graders? In 2000, 12th-graders at the 50th percentile had a scale score of 302, just 3 points above the level of eighth-grade proficiency.³⁷ We can be sure that an eighth-grader at the *proficient* level as defined by NAEP exceeds the average performance of ninth-graders, the level identified by Murnane and Levy. The data suggest that seeing all high school students reach the target set by NAEP for eighth-graders is still a distant goal. The data also seem to show, however, that reaching that level of proficiency or higher would help qualify high school

graduates for better paying jobs. And then, beyond that, would be a goal of having all students qualify to pursue credit work in college.

The soft skills required in the “new basics” and listed by Murnane and Levy support results from the various employer surveys summarized in this report — skills such as the ability to “solve semi-structured” problems, to work in groups with persons of various backgrounds, and to communicate effectively, both verbally and in writing. One firm examined also lists ability to use personal computers to carry out simple tasks such as word processing.

Another finding from the report is that employers value cooperative education. Northwestern Mutual Life said it preferred to hire college graduates, but that the high school graduates it hired “were usually individuals who had worked at NML while in high school as part of a cooperative education program, a program which provides supervisors a firsthand opportunity to observe a student at work.”³⁸

Cooperative education has long been off the radar screen at the national level, and enrollment levels are not even tracked by the U.S. Department of Education. In 1996, this author reported that “the data on enrollments and completions in high school cooperative education programs have never been particularly good, and data collection was abandoned by the Department of Education in the 1980s.” The high school reform movement needs to revisit this well-tried partnership between schools and employers, where there can be a back-and-forth about what needs to be taught in the classroom and on how soft skills can be acquired.

Murnane and Levy have made the case that a ninth-grade education along with desired soft skills can equal an opportunity to earn a middle-class wage. But what is meant by such a wage? Some in the reform movement have equated it with a “good job.” In 2002, the median annual earnings for a 25- to 34-year-old male who worked full-time for a full year was \$35,487; for a female it was \$30,093 (see Figure 7). That figure has been going down for men, from \$42,918 in 1971*, and up for women, from \$27,567 in 1971 — with earnings often not moving in a straight line over in-

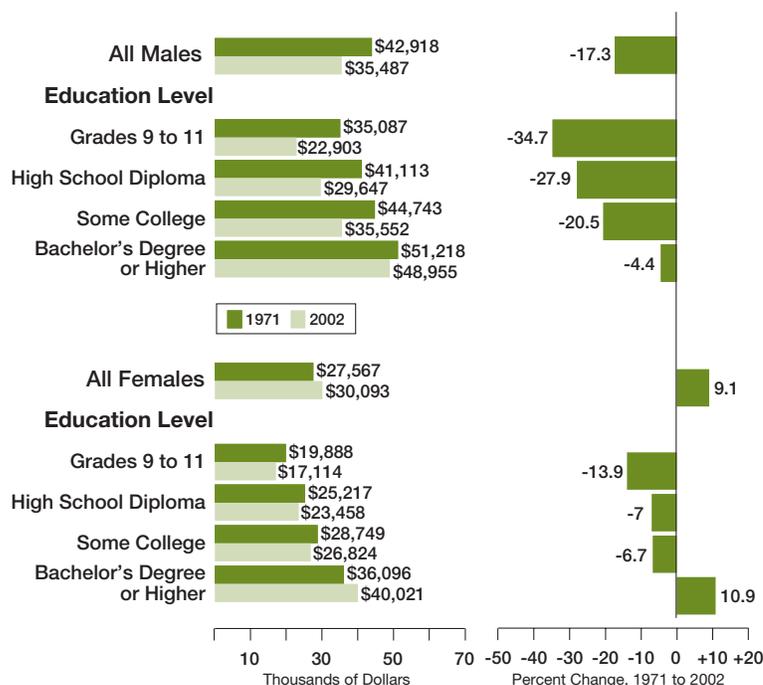
³⁷ Braswell et al., 2001.

³⁸ Murnane and Levy, 1996, p. 31.

* The incomes here and in the following paragraph are in constant 2002 dollars.

Figure 7

Median Annual Earnings (in 2002 Dollars) of 25- to 34-Year-Olds Who Worked Full Time for a Full Year, 1971 and 2002, and Percent Change



Source: National Center for Education Statistics, *The Condition of Education, 2004*, Table 14-1.

tervening years. Those are middle-class earnings, by definition. Depending on where a person lives, such earnings might permit what is considered a middle-class life for a single person, but not for a family with children. And it is important to remember that those are the earnings of people with a *full-time job who work for a full year*.

The averages are for all levels of education. Males in the age range described — a time of achieving independence and forming families for many people — who have a high school diploma had median earnings of \$29,647 in 2002, down 28 percent from \$41,113 in 1971. Females with a high school diploma had lower earnings, but their earnings declined less, from \$25,217 in 1971 to \$23,458 in 2002.

The truth about middle-class lifestyles for families is that, increasingly, they are not attained with a single wage. As earnings have slipped for men at all educational levels, remained lower for women, and decreased for those with less than a bachelor's degree, *family income* has stayed at middle-class levels be-

cause of the increasing frequency of two-earner families, and of individuals holding down more than one job. More and more, middle-class standards of living for high school graduates are out of reach for one-earner families — and to an even greater degree for those not completing high school. Average median individual incomes at all educational levels are in long-term decline for 25- to 34-year-olds, except for women with a bachelor's degree or higher.

The goal of having everyone who does not pursue postsecondary education reach the level of academic achievement identified by Murnane and Levy, while also acquiring the set of the “soft skills” desired by employers, is an ambitious one. Of course, encouraging individuals to pursue further education is also a laudable goal in itself. While a large proportion of jobs are open to those with lower levels of educational attainment, prudence (and social justice goals) dictate the importance of efforts to raise the level of achievement for everyone.

While the BLS data on employment projections used in this report attempt to factor in the potential effects of globalization, the picture may be bleaker than the one painted here. Higher educational attainment is necessary insurance for the economy and for individual security.

Teenagers, whether in school or out, have been steadily slipping in the labor market, as have both young and older high school graduates. The future will likely bring more competition stemming from the increased participation of women in the labor market and from older workers who remain in the labor market as they live longer and face less stable pension and medical insurance programs. Questions about the long-term adequacy of Social Security and Medicare also come into play. More education can provide a buffer for these uncertainties and provide insurance against potential adversity. We need better information from which to predict our economic future in what author and journalist Thomas L. Friedman has called a “flatter world,” and what that information means for both the structure of occupations and for education policy.

The School of Work

The evidence is clear that previous work experience is at or near the top of the list of what employers look for in candidates, when higher education is not required. Many teenagers gain that experience while in school, working part time and during summers. And their first jobs after leaving school, typically in teenage-intensive industries, provide experience and recommendations that can be helpful in moving many of them into more desirable jobs over time.

While the opportunity for “useful” experience varies from job to job, important lessons are learned from most jobs. Discipline and responsiveness to employer demands must be learned in order to stay employed. An employee has to show up on time, dress appropriately, relate to and get along with co-workers, follow instructions, take responsibility (of course, to varying degrees), and often interact with customers.

Given the recognized role of school in preparing for success in work — wherever that is in order of importance — schools have an unavoidable responsibility to their students in this regard. But how can schools best prepare students for the workforce? Do schools need to be knowledgeable about the role that work experience plays and make efforts to remedy the gap between the haves and have-nots with regard to the schooling role of work? In cooperative education-type arrangements, there is a close relationship between the school and employer.

Trends in unemployment rates for teenagers paint a bleak picture for teens seeking to gain experience in the school of work, Andrew Sum and his colleagues recently disclosed. Sum’s principal conclusion is, “New job growth since the early fall of 2003 has completely bypassed the nation’s teenage population.”³⁹

In 2000, 45 percent of teenagers were employed; this number fell to 36 percent in 2004, making it the largest decline of any age group. Going back to 1979, 49 percent of teenagers were employed. Today, in 2006, the teenage employment rate is at its lowest in the 57 years that data have been available.

There is a similar pattern of decline in employment among 16- to 19-year-olds who are in school, specifically,

falling from 38 percent in 2000 to 30 percent in 2004. Students who work while in school and do not continue their education have more job experience immediately after leaving school than those who did not work.

In 2000, there was a large disparity by race and ethnicity among high school students who worked: 30 percent for Black and Hispanic students, and 49 percent for White students. By 2004, all high school employment rates had declined — to 22 percent, 30 percent, and 40 percent, respectively. Not coincidentally, Sum found that those in groups with the highest unemployment rates as adults are getting the least employment experience when they are teenagers enrolled in school.⁴⁰

Somewhat surprisingly, high school students with low-income parents (under \$20,000) have the lowest employment rate: 15.3 percent. The rate rises as income increases, up to 39.6 for those with parental incomes of \$60,000-\$75,000, and then dips slightly at incomes above those amounts.

Reports Sum: “Fewer than 7 percent of Black male high school students in low-income households were employed in 2004, versus 12 percent of low-income Hispanic males and 23 percent of low-income White males.” Youth from low-income families may need money more than others, but they have the fewest jobs. As a result, they are getting the least real work experience and, are therefore, setting themselves up for difficulties later on.⁴¹

* * * * *

High school reformers recently have been describing their areas of emphasis as better preparation for college and better preparation for work, for those not going to college. With regard to preparation for work, the quality of judgments exhibited by reformers will determine how useful resulting changes are. This report offers a short version of what the employment world looks like and what it might look like over the next half-dozen years, based on substantial — but still limited — information.

³⁹ Andrew Sum et al., *The Paradox of Rising Teen Joblessness in an Expanding Labor Market*, Center for Labor Market Studies, Northeastern University, January 2005.

⁴⁰ Sum et al., 2005, pp. 6-12.

⁴¹ Sum et al., 2005, p. 12.

Discussion

This short report is often a distillation of other distillations. Further compression of the data presented is hardly possible or useful.⁴²

Overall, this author thinks the public must listen to what employers and hiring agents say about hiring preferences — especially when the preferences relate to those who recently left school. And we cannot ignore the age at which employers hire, particularly for higher-paying jobs. If employers don't want to hire high school graduates until the graduates are four to six (or even more) years out of high school, *no change in the high school curriculum will make them any older*. On the plus side, this would mean students have more than just the four years of high school to gain academic knowledge and also prepare for the world of work. So the fixed objective for students can be adequate preparation for what is to come — but the preparation **time** can be flexible.

We also cannot ignore the fact that when hiring candidates just a few years after leaving high school, employers are not necessarily preferring those with high test scores and high grades; even when hiring high school graduates years down the road, employers are not asking for transcripts. That is unfortunate, because it sends signals to applicants that school achievement doesn't matter.

There are, the data projections show, a lot of openings for high school graduates who do not go on to college. However, the jobs immediately available are likely in teenage-intensive industries. Earnings in those industries vary but are relatively low overall.

Many occupations, Table 4 revealed, are *shared* by dropouts, graduates, and those with some college. And *most* jobs with a large number of openings on the horizon require little in the way of quantitative literacy.

A dichotomy has been established between preparing for college and better preparing directly for work. Almost everyone is ultimately going to work; postsec-

ondary education is a huge employment-preparation system, and high school is preparation to enter that system. People enrolled in higher education, for the most part, prepare for specific occupations. *The Digest of Education Statistics* has a table eight pages long listing the occupations/professions for which degrees were awarded in 2001-02. Only relatively few of those degrees, for example, are in liberal arts.

Increasingly, the trend is to disapprove of anything that is direct preparation for work during high school, even though great advances have been made in integrating academics into career or technical education, with an option kept open to go to college.⁴³ High school is the last education opportunity paid for wholly by the public. Its purpose has to be to do the best it can to provide all who leave it the foundation necessary to enter, or further prepare for, adult life.

Becoming qualified for college-level classes or for entering a job directly out of high school is not the sole purpose of a high school education. Other purposes, and the question of whether high schools are well-equipped to serve them, have not been directly addressed in the current high school reform movement. Preparing citizens to participate in a democracy where everyone is expected to listen carefully and think critically surely is at the top of the list of what we expect high schools to accomplish.

A broad view of the purposes of high school and the need for improvement was well stated by Michael Cohen in 2001 when he was with The Aspen Institute. His thoughts include the following:

Promoting healthy personal and social development is an important objective of high schools and is an integral part of their academic mission. Helping young people develop their skills, attitudes, and dispositions is necessary for successful transition to adulthood — a source of personal identity and civic responsibility,

⁴² A new analysis was not available when existing information was being summarized for this report. The analysis is a book by Michael J. Handel, *Worker Skills and Job Requirements*, published in late 2005 by the Economic Policy Institute. Handel's conclusions are generally consistent with those presented in this report. He finds that "...skill demands have risen only gradually over time, with little evidence of any recent acceleration in skill demands... Perhaps surprisingly, a lack of computer and other high level skills are not oft-cited complaints." The last statement is based on surveys of employers that he has reviewed. Also, he finds an emphasis on deficiencies in the "soft skills" of job applicants.

⁴³ For an excellent analysis of directions for career and technical education, see Betsy Brand, *Rigor and Relevance: A New Vision for Technical Education*, American Youth Policy Forum, April 2003.

personal habits of persistence and reliability, and a commitment to community and sense of their place in it — can't be accomplished solely within the walls of the high school. Therefore, states should consider requiring students to participate in at least some community-based activities . . . These activities might include service learning, structured internships, field-based investigations or other community projects.⁴⁴

Employers would likely see in Cohen's list many of the qualities they are looking for in young job applicants. The new Chamber of Commerce-led effort to create an assessment of the skills employees need for entry level jobs — communications, interpersonal, decision-making, and lifelong learning skills — can help inform the high school reform movement.

The focus of education cannot be limited to creating academically rigorous courses that help those who are planning to go to college — so they can prepare for the really good jobs. *The facts do not support the proposition that employers of high school graduates need, or are looking for, academic achievement alone.* This is not at all to say that academic achievement is where it needs to be. For a significant segment of the population, it is too low and needs to be raised. The bar needs to be high enough so students graduate with the skills they need to continue to learn throughout their careers and throughout their lives.

An examination of recent results of the National Assessment of Educational Progress reveals high levels of low performance in high school, preceded by low performance in elementary and middle school. This presents serious implications for our economy. And with Baby Boomers retiring over the next 20 years or so, the country will need replacements with equivalent or better credentials.

The High Schools That Work (HSTW) program of the Southern Regional Education Board provides a model to follow in its 1,000 participating high schools in 32 states. HSTW sets high academic standards for students taking courses preparing for occupations

and measures their progress regularly, with a goal of raising academic achievement. The HSTW model embraces career and occupational preparation, integrated with academics. And while it strives for increasing academic achievement, its goal does not extend to qualifying all students to qualify for credit work in college.

South Carolina's lawmakers have just adopted the HSTW approach with the Education and Economic Development Act of 2005, based on three years of work of a task force of business leaders and others. The state developed 16 career clusters that schools can use.

Richard Kazis, senior vice president of Jobs for the Future, commented that the new law shows that politicians and business leaders are becoming more interested in the career training that students receive in high school and that governors and legislators are realizing they can't discuss high school improvement without focusing, in part, on career programs — something that hasn't traditionally been done.⁴⁵

Typically, high school reform has focused on better preparing students for college. For example, the American Diploma Project did a thorough job of supporting the case for more advanced coursework in high school so that those planning to attend college qualify to take credit courses when they enroll. That work was backed by Michael Kirst's Bridge Project. But support for the conclusion that the same augmented academics are necessary for high school graduates seeking jobs was not supported.

Despite their limitations, the American Diploma Project and the Summit of Governors and Chief Executive Officers, which was held in the winter of 2005, have given high school reform impetus and deserve widespread support. But the discussion here is only of broadening the reform objectives and focuses more directly on preparing students to enter the labor market.

Of the four workplace benchmarking examples cited in the American Diploma Project report, only *one* involves a job that does not require postsecondary education: a machine-operator at the Eastman Chemical Company in Kingsport, Tenn. The Bureau of Labor

⁴⁴ Michael Cohen, *Transforming the American High School: New Directions for State and Local Policies*, Ideas for the Future and The Aspen Institute, March 2001, p. 118.

⁴⁵ Alan Richard, "South Carolina Launches Career-Preparation Initiative," *Education Week*, Nov. 30, 2005.

Statistics is quoted as saying that employers prefer to hire applicants for machine operator jobs with “good basic skills.” Workers prepared for those jobs through an apprenticeship program, making them a good option for high school graduates. By no stretch does an applicant need achievement in high school that is high enough to qualify to enter credit coursework in college.

Those making education policy have a responsibility to come to grips with the kind of workforce preparation that employers value. They would also be wise to involve employers in decisions more directly — perhaps through partnerships such as those urged by the National Association of Manufacturers and others.

There have been a number of successful partnerships between employers and educators. Many are still in existence, such as the Lansing Area Manufacturing Partnership (LAMP), an effort among General Motors, the United Auto Workers, and the Ingham Intermediate School District that allows high school seniors to gain knowledge and skills related to careers in manufacturing. For students to gain the experience and on-the-job learning that employers value, they must have access to the internships, co-op programs, and youth apprenticeships that such partnerships provide.⁴⁶

For over a decade, Johnson and Johnson has operated the Bridge to Employment Initiative, with each project consisting of a local Johnson and Johnson operating company at one or more local schools, an institution of higher education, and an intermediary organization. The partnerships are about “maintaining high standards of academic learning for all students; providing opportunities for contextual learning; creating links with institutions of higher education; and connecting students with adults in the workplace.”⁴⁷

Employers who participate in partnerships with schools say the following:

- “Staying competitive means that we must rely on the public education system to teach core skills. Therefore, partnering with educators as our supplier is fundamental to success.” – Lee Doyle, Bell South
- “If connecting the classroom to the workplace can help diminish the skills gap between what employers require to remain competitive and the jobs for which graduating seniors are adequately prepared, this is an effort that will serve our entire nation.” – Larry Stupski, Charles Schwab and Company
- “We designed the Youth Apprenticeship in Consumer Service Management to link structured classroom instruction in the secondary school with training at the restaurants.” – Carole Rogers, McDonald’s USA⁴⁸

In 1999, two national business coalitions announced a campaign for “expanding employer involvement in contextual learning for high school students.”⁴⁹ That sort of work is a step in the right direction toward determining what kind of preparation and help is needed, the realities of the labor market, and how schools and employers can best work together. Clearly, employers see the need for higher academic achievement, as well as the need for better preparation in school in the other qualities and abilities that they find necessary for potential employees to possess.

Potential high school reforms must consider the three in ten students who do not make it to graduation in the standard four years. There are many ways to see more students through school — approaches that are backed by strong research support.⁵⁰ And perceived and documented relevance to a successful transition to work — through school/business partnerships — is

⁴⁶ For a summary and analysis of many joint school-employer ventures, see Thomas Bailey et al., *Working Knowledge: Learning and Education Reform*, Community College Research Center, 2003.

⁴⁷ Laura Brooks et al., *A Decade of Promising School-to-Career Partnerships*, National Institute for Work and Learning, Academy for Educational Development, 2005.

⁴⁸ Joan Wills, *Voices of Employers*, Center for Work Force Development and the American Youth Policy Forum, 1998.

⁴⁹ National Alliance of Business, *Work America: The Business Voice on Workplace Development*, March 1999. The other coalition was The National Employer Leadership Council. While both organizations have gone out of existence, the seeds they planted may be still growing in many places.

⁵⁰ Paul E. Barton, *One-Third of a Nation: Rising Dropout Rates and Declining Opportunities*, Policy Information Report, Policy Information Center, Educational Testing Service, February 2005.

likely to increase the holding power of schools, for it will strengthen students' perception that staying in school will help them land better jobs.

Determining requirements for acceptance to college or for eligibility to enter credit courses is relatively straightforward; applications and tests pave the way.⁵¹ The requirements, qualifications, and avenues of preparation to enter the workforce are not straightforward; they are varied, and deciding what to do is not simple. And as Albert Einstein said, "Things should be made as simple as possible, but no simpler."

⁵¹ What does not seem to be dealt with, however, is that preparation for a top university is going to be greater than for the local community college; a single standard for preparation for all college credit courses does not exist.

Appendix

Best Matches of Occupational Categories Between Jobs Listed in Table 4 and Jobs Listed in *What Jobs Require* Report.

Table 4	What Jobs Require
Maids and House Cleaners	Private Household Workers
Food Counter, Fountain and Related Workers	Fast Food Counter Preparation and Service Workers
Farm Workers	Farm Laborers, Crop, Nursery, and Greenhouse Workers
Construction Laborers	Helpers, Construction Trades
First Line Supervisors of Construction Workers	Food Preparation Workers
Executive Secretary and Administrative Assistants	Clerical Supervisors and Managers
First Line Supervisors of Office and Administrative Support Workers	Clerical Supervisors and Managers
Team Assemblers	Hand Workers Including Assemblers and Fabricators
First Line Supervisors of Retail Sales Workers	Marketing and Sales Worker Supervisors
First Line Supervisors of Retail Sales Workers	Marketing and Sales Worker Supervisors
Sales Representative, Wholesale and Manufacturing Expert, Technical	Marketing and Sales Occupations
Customer Service Representatives	Receptionists and Information Clerks
All Other Teachers	All Other Teachers and Instructors
Middle School Teachers, Except Special and Vocational	Teachers, Secondary
First Line Supervisors of Retail Sales Workers	Marketing and Sales Worker Supervisors



Listening. Learning. Leading.