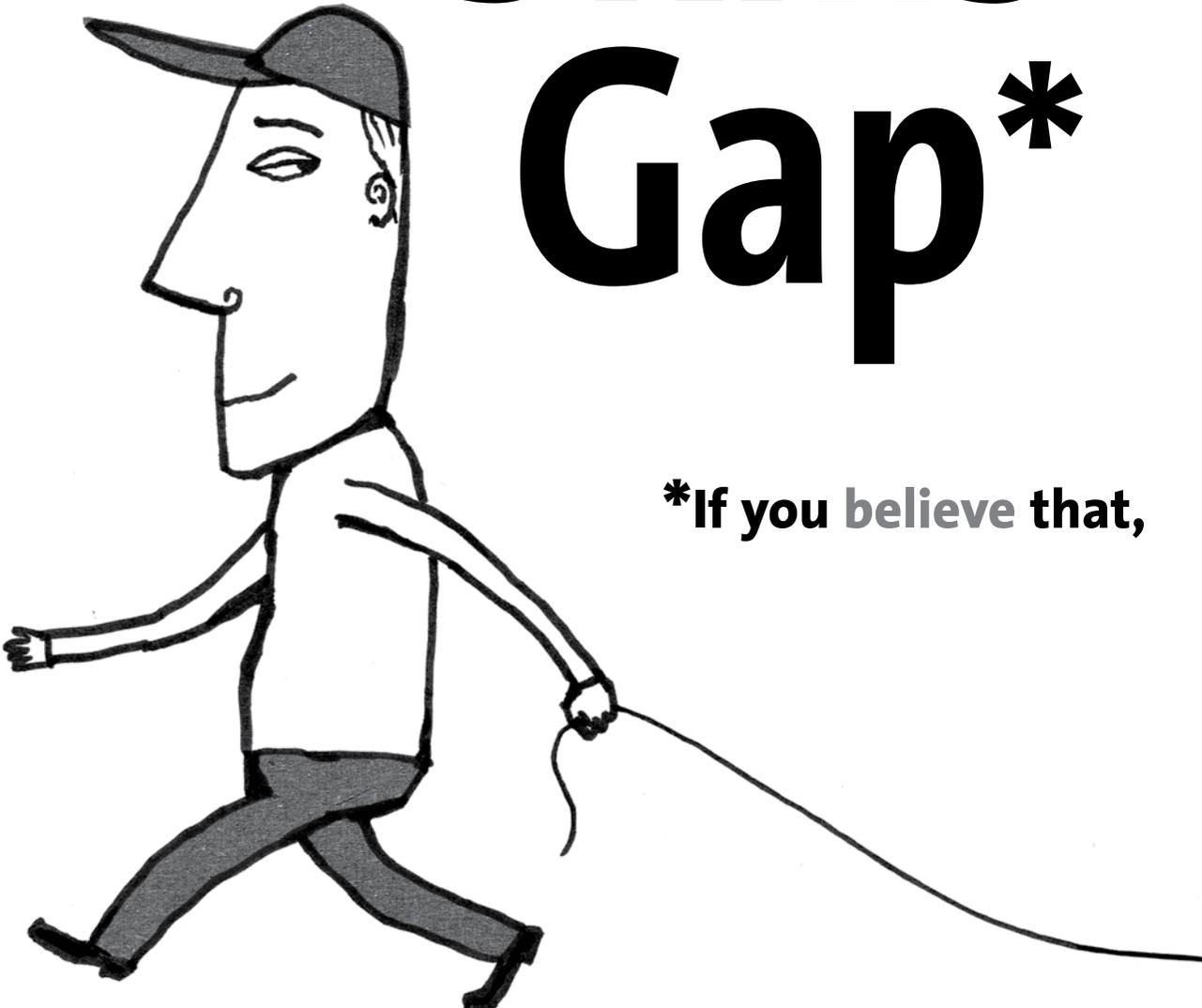


THERE IS A

Skills Gap*



***If you believe that,**

The idea that there are widespread problems with the supply of skills in the United States is widely accepted, driven not only by stories from employers who say they cannot fill vacancies but also by detailed reports from business associations – and even organizations lacking a direct stake in the issue, like the National Academy of Sciences. The Obama administration’s recent call for more job training so that applicants can get the skills to fill these jobs only reinforces the point.

Tales of jobs gone begging should stir some skepticism, though, as they have increased since the 2008 Great Recession, years in which the numbers of unemployed (most of them recently employed) far exceeded job openings. Nor is there indirect evidence of shortages in ways we might expect it, such as in rising wages. Instead, the claims are based on surveys of employers, who say they have difficulty hiring the workers they want. These laments tap into common beliefs about the shortcomings of American education – that students are opting for irrelevant majors in college, and so forth. The reports’ recommendations invariably include increasing immigration quotas and redoubling efforts to inform college students of the consequences of their curriculum choices.

you’ve been diverted from the real issues...

BY PETER CAPPELLI



SKILLS SHORTAGES

Such reports have had a powerful influence on public debate about the competence of American workers and the adequacy of high schools and colleges. Virtually all of them are framed in terms of concerns that the economy as a whole is suffering. But it is difficult to escape the fact that the conclusions are largely drawn from sources with a material interest in labor and education policies. And a closer look raises serious questions about their validity.

FRAMING THE PROBLEM

The arguments that skills are wanting take various forms. The most extreme complaint is that there are widespread shortfalls in the basic skills of future employees. The problem is usually attributed to the failure of American education, especially K-12 public education, to meet its responsibilities. We refer to that alleged problem as the “skills gap.” A second complaint focuses on specialized skills, such as the familiar assertion that the U.S. is short on engineers or information technology specialists. We refer to that as the “skills shortage.” The final concern, more common outside the United States, is that at any given time, the supply of and demand for specific skills is out of synch. We refer to that as the “skills mismatch.”

Employers in the postwar era typically selected employees for general abilities at entry-level positions, then trained them over a working lifetime to meet the employers’ needs. The recent assertions about skills problems have quite a different underlying model in mind, although it is typically unstated. Job

candidates’ skills, which are either adequate or not, are supposed to arrive with the applicants. It thus follows that a key goal for public education is to provide graduates with the skills employers want.

REPORTS OF SKILLS GAP AND SKILLS SHORTAGES

Concerns about the supply of skills in the United States are hardly new. Their contemporary roots go back to the post-Sputnik 1958 National Defense Education Act, which increased funding for science and engineering education in an effort to compete with the Soviet Union. The idea that schools were failing became popular with the National Commission on Excellence in Education’s 1983 report, *A Nation at Risk*. But during the 1980s and 1990s, the dominant view remained that providing job-related skills was the responsibility of employers.

Discussions in the 2000s changed direction sharply, beginning with the consultant-driven idea that the U.S. economy was facing an overall shortfall in the supply of labor. Despite the absence of any evidence, the Society of Human Resource Management reported that large numbers of employers were preparing for a labor shortage predicted by 2010.

More common than the overall-labor-shortage view was the idea that there would be a shortage of college-educated workers. The President’s Council on Jobs and Competitiveness, a business-led group, claimed that the country would be short by 1.5 million graduates by 2020. Others narrowed their concerns to a projected shortfall of science, technology, engineering and math (STEM) graduates. The Department of Commerce concluded that the United States would need to expand both immigration and education to meet skills shortages in IT as early as 1997 – a conclusion that was almost immediately contradicted by what

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was then the U.S. General Accounting Office. No matter; the National Academy of Sciences produced six separate reports related to STEM-skills issues just in 2012, many about expanding the supply.

Few reports countered the skills-shortage idea. But those that did had the evidence on their side – pointing out, for example, the fallacy of assuming that every job using STEM skills required a STEM degree. In fact, few computer programmers have bachelor’s degrees in computer science. Moreover, roughly half of recent engineering graduates do not take jobs as engineers, either because they cannot not find such jobs or because the ones offered pay less than alternatives in other fields. Many of the employer-based reports also offer contradictory evidence – for example, citing survey respondents who admit they are unwilling to offer wages that are high

enough to attract the candidates they want.

Studies that survey recruiters rather than higher-level executives also reported something different than the skills-gap notion. Their consistent conclusion: any shortfalls in new graduates are related to poor workplace attitudes, not classroom skills – and those complaints haven’t changed for decades.

Academic research on these questions, by contrast, has been sparse. Much of it focuses on the more general question of whether skills requirements are rising. Here, the consensus is that overall requirements have been trending upward in recent decades, albeit slowly. In 2006, Stephen Vaisey, a sociologist at Duke University who compared educational qualifications to the educational requirements of jobs, found that average American workers were overqualified for their jobs and that the degree of over-qualification had

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been increasing. Other studies found that the changes in skills requirements for the average U.S. job over the past 40 years have been small – and, most surprisingly, there has been no increase in STEM-skills requirements. Meanwhile, the evidence that individuals lose by being overqualified for their jobs is overwhelming, while the evidence that companies benefit from employing overqualified workers is modest at best.

A different set of claims asserts that the economy or the labor market has changed in

cants – an astonishing figure given that the Bureau of Labor Statistics found only 220,000 total vacancies in manufacturing during the year Deloitte made the estimate. By contrast, Paul Osterman at M.I.T. and Andrew Weaver at Indiana University recently found that two-thirds of manufacturing employers report no vacancies, and only one-quarter have had vacancies open long enough to suggest there was difficulty in filling them.

A different question, which gets closer to the heart of any skills question, is whether vacancies are taking longer to fill now than in

It would be wrong to assume that typical high school graduates are identical to average college graduates except for education and that the former would make the same wage as the latter if they had college degrees. Yet that assertion is commonly made.

ways that have altered the balance between the supply and demand of skills. Edward Lazear, an economics professor at the Stanford Business School, and James Spletzer, a Census Bureau economist, examined that argument and rejected it. Yet such claims continue to be made.

Among the most puzzling claims: the President's Council on Jobs and Competitiveness (among others) asserted that the presence of vacancies is evidence that jobs cannot be filled. The standard view, of course, is that vacancies prove only that time is required to post the job advertisement, collect applications, process them and hire someone. Deloitte, the consultants, claimed in 2011 (on behalf of the National Association of Manufacturers) that 600,000 good jobs in U.S. manufacturing couldn't be filled for lack of qualified appli-

the past. The Beveridge Curve offers indirect insights into the question by capturing the relationship between the unemployment rate and the number of job openings as a proportion of the labor force. Jobs that stay open get counted again in each estimate, so a change in the length of time required to fill jobs would cause an apparent outward shift in the curve.

Regis Barnichon and his colleagues at the Brookings Institution found that the Beveridge Curve did, indeed, shift after the Great Recession in 2009 and that the shift was caused by a decline in hires per vacancy expected at the relevant level of unemployment. Many factors could account for that decline, such as greater hiring of those already employed elsewhere (which generates no net employment gain) and a decline in filling vacancies from within (which expands the vacancy

rate). Stephen J. Davis, an economist at the University of Chicago, and his colleagues, for their part, found that recruiting effort per vacancy has fallen. This change in the Beveridge Curve, the cause of which remains unclear, is, in the end, the best evidence that something has indeed changed in the labor market.



sult. In the process, they bump the applicants without college degrees, who end up with even lower-skilled jobs or none at all.

On average, college graduates make more money than high school graduates, but what we make of that fact should be considered carefully. Because the premium represents



Among the most-cited evidence about the demand for skills is the finding that the difference in pay between the average college graduate and the average high school graduate has changed. That wage premium was rising in the 1980s even as the relative supply of college graduates rose, suggesting that there was a shift in demand toward more-skilled and more-educated workers.

But since the 1980s, evidence of a continuing shift has not been as compelling. Indeed, some studies conclude that the demand for skills that require college degrees is actually declining and that college graduates are forced to look to jobs that require less talent as a re-

the difference in average wages, it is not necessarily representative of the experience of new hires – nor predictive of the future college premium. And strikingly, the premium appears to have declined during the Great Recession, falling from 69 percent to 63 percent between 2008 and 2011.

College graduates are different from high school graduates in ways other than educational attainment, and those differences also affect the premium. It would be wrong to assume that typical high school graduates are identical to average college graduates except for education and that the former would make the same wage as the latter if they had

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college degrees. Yet that assertion is commonly made.

The college premium has also been influenced by factors that have nothing to do with the demand for college graduates. The decline of unions, for example, pushed wages down disproportionately for high school grads, thereby increasing the college premium from the other end. The education-mismatch literature also shows that the wage premium from a college degree comes mainly from getting access to jobs that require college-level skills. College graduates in jobs that require only high school skills earn little more than high school graduates doing the same work. In the eyes of coffee-shop managers, it seems that a barista is a barista, with or without a degree in civil engineering.

That should remind us of the fallacy of composition: it may make sense for an individual to secure a college degree in hope of snagging a job that requires college skills. Whether it makes sense for society as a whole to send a higher percentage of high school students on to college expecting that they will all earn that same premium is questionable.

STUDENT ACHIEVEMENT

The assertions about student achievement (or, rather, the lack thereof) that get the most attention are those that cast the blame for skills gaps on public education. The argument is that American students are not learning as much as those in other countries, although how this should create a mismatch with job demands is not completely clear. The latest data show that the United States is in the middle of the country rankings on student achievement. Moreover, Tom Loveless of the Brown Center on Education Policy notes that there is no statistically significant difference between U.S. scores and those for countries

several positions higher in the rankings. Further, Loveless points out that the United States' ranking has not been declining relative to other countries.

The fact that Asian countries (Singapore and Korea) and Chinese cities (Hong Kong and Shanghai) have risen to the top ranks has received considerable attention. What is not clear, though, is how much credit for those high scores should go to their schools, since roughly two-thirds of their students also attend after-hours tutoring (often at great cost).

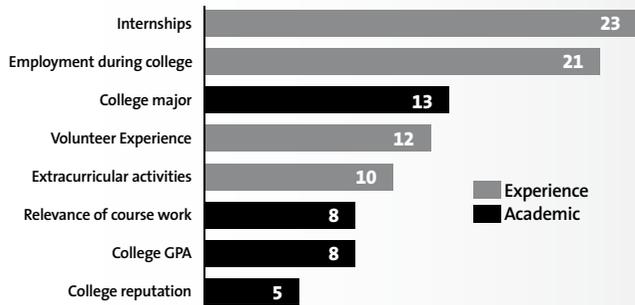
The newest and most powerful evidence on skills across countries comes from the OECD's Program for International Assessment of Adult Competencies. It compares workers' skills – literacy, numeracy and problem-solving in an IT context – rather than students' skills. It is assessed directly with tests of representative, random samples of the workforce from each country. And here, the United States ranks 17th in literacy, 22nd in numeracy, and 14th in problem-solving out of 24 countries participating, far below average and much worse than our students do in international comparisons of academic achievement. A related assessment of the U.S. position comes from a recent study of the wage premiums associated with the Program for International Assessment of Adult Competencies skills data. It finds the highest skills premiums are in the United States, which is consistent with the hypothesis that these skills are in short supply compared to other countries.

Academic preparation, completed decades earlier for the average respondent – cannot explain these poor skills showings of U.S. workers. As the OECD program's authors note, the United States has a more-educated workforce than average and the relative position of U.S. student achievement is much higher than its position in worker skills. Thus, something appears to be happening to students' reading and

EMPLOYER PREFERENCES FOR APPLICANT ATTRIBUTES

RELATIVE IMPORTANCE OF QUALITIES IN EVALUATING GRADUATES FOR HIRE (SCALE OF 0-100)

Q: How much weight do you give each of the following educational credentials when you evaluate a recent college graduate's resume? How much weight do you give each of the following types of experiences when you evaluate a recent college graduate's resume to see if further discussions are warranted? (weighted by importance of academic performance vs. experience on hiring of recent graduates to obtain an aggregate score)



SOURCE: Chronicle of Higher Education (2012)

numeracy skills after they leave school that is different from what is happening elsewhere.

Something appears to be diminishing the abilities of U.S. workers relative to those in other countries, such as less workplace training to keep their skills sharp. Another possibility relates to immigration differences. On average, immigrants to the United States score less well on cognitive skills than immigrants to other countries do. So the addition of relatively large numbers of low-skilled immigrants to the workforce may lower average U.S. skills scores.

The Program for International Assessment of Adult Competencies also asked employers about the hiring criteria (academic degrees and similar credentials) in their current jobs and compared them to their employees' qualifications. Hiring criteria are not identical to job requirements, of course, and we would expect employers to be choosier in a buyer's market, as they have been in recent years. Compared to the average across OECD countries, more U.S. workers believe that the skills needed to perform their jobs are actually greater than the current hiring requirement (12 percent vs. the 7 percent OECD average). But far more U.S. workers believe that the actual requirements are lower than the hiring requirements.

The number of college graduates produced is not declining in the United States, or even declining relative to other countries. Bachelor's degrees granted increased by 31 percent in the decade following 2000-01, while associate's degrees increased by 62 percent even as the population grew by just 11 percent. (It's true that the United States does not lead the world in the percentage of college graduates in the population. But it hasn't for some time: Russia, Canada, Japan and Israel are all ahead in that regard.)

WHAT'S REALLY GOING ON HERE?

U.S. employer-led complaints about skills (broadly defined) are not new. Manufacturers have been complaining that they faced skills shortages and have periodically issued dire warnings about future skills problems, all of which amounted to crying wolf.

What the complaints from employers about skills problems might actually mean remains elusive because employer-driven studies have been so poorly designed. It is also difficult to know if there is really anything new to their complaints, given that we do not have similar data from earlier periods. Whatever the reality, it is important to recognize that few of the complaints apply to those just leaving school, since the vast majority of the workforce—and

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an even larger percentage of new hires (given employers' preference for experienced applicants – left school long ago. Concerns directed specifically at post-school applicants focus on maturity, not academic skills.

One explanation for the greater visibility of complaints is that it is a by-product of the broader rise in business lobbying intended to influence public opinion and government policy in ways that benefit employers. Employer complaints in the IT sphere, for example, go hand-in-hand with lobbying efforts to increase access to skilled foreign workers through the expansion of the H-1B quota for visas for such employees. The basic conflicts between labor and management are not far from the surface in many of these exchanges, with employer groups aiming to increase the pool of applicants who will accept lower wages, while organized labor argues for the opposite.

The reports on skills problems from consulting firms are also consistent with a self-serving explanation: their business models are rooted in helping business clients address perceived problems. Highlighting or even asserting problems and then offering solutions to them are common practices. The firm HR-Marketer, which provides advice on how to sell consulting services to human resources departments, opens the door to a related explanation. The firm recommends that vendors produce white papers and other reports addressing big questions in order to build credibility with clients. And one of the questions targeted is the asserted shortfall of talent.

Alternatively, the rise in such employer complaints might reflect something real, even if it is not caused by changes in the supply of skills. Hiring may well be more difficult now simply because employers have to do much more of it because substantial declines in average employee tenure translate into more-

frequent vacancies. The decline of lifetime employment practices and the associated rise of lateral hiring have been underway for some time, especially in larger organizations. The fact that the decline in tenure is disproportionately associated with larger firms, where promotion from within had been more common, may have an even bigger effect on hiring if it undermines promotion-from-within systems or is a marker for their decline. When employees who have been promoted from within leave unexpectedly, it may be difficult to fill their jobs from within because no internal candidates may be ready for advancement.

A decline in promotion-from-within systems also increases hiring challenges substantially by expanding the range of skills that must be recruited. Most hiring is no longer at the entry level, where skills requirements are modest. Now, virtually every position is potentially filled by outside hires. Indeed, one proprietary survey of employers found that 72 percent of their positions were filled from the outside in 2007.

Few employers' reports of skills problems ask what it is employers are looking for in candidates that they cannot find, but the evidence suggests that it is work experience. Work experience is the crucial attribute that employers want – even from fresh graduates who have yet to work full-time. Course work, in contrast, is just not that important.

Credible evidence on employer-provided training in the United States is remarkably hard to come by, especially for recent decades. The data we do have suggest that in 1979 young workers received on average about 2.5 weeks of training per year. In 1991, Census data found only 17 percent of all employees reporting they received any formal training that year. Several surveys of employers around 1995 indicate that where training was provided, it averaged under 11 hours per year.

(The most common training topic was workplace safety.) Those figures, by the way, include what vendors provide when they bring in new equipment – as in, “Here’s how to work this copier.”

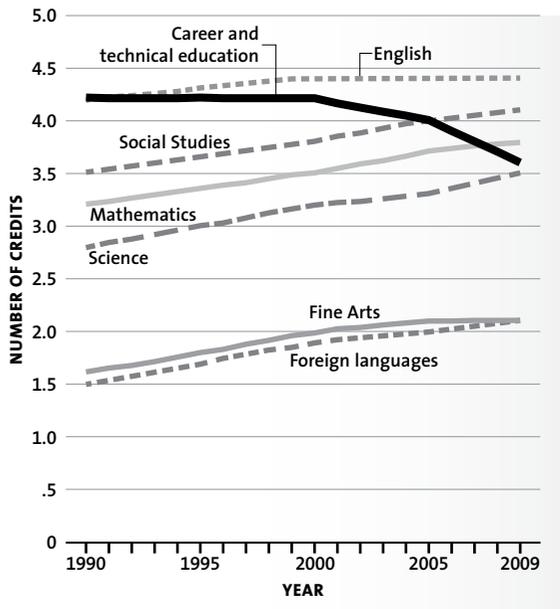
The above data are now almost 20 years old, and there is little new from government sources. In 2011, Accenture, the management consulting firm, surveyed U.S. employees and found that only 21 percent had received any employer-provided formal training in the previous five years.

The most important source of training for craft-based skills has long been apprenticeship programs. Data on these programs are scarce, but the Department of Labor’s numbers show a sharp decline from 2002 to 2012 – from roughly 33,000 programs to 21,000 – and an even steeper decline in the number of apprentices – from roughly 500,000 in 2003 to 280,000 in 2012. The 50,000 or so annual graduates of these programs are a drop in the bucket in a labor force of 160 million.

Further, the quality of apprenticeship programs is not necessarily constant. In the construction industry, union-management joint-apprenticeship programs have been in decline, replaced by employer-based programs. Participants in the latter do not perform as well as those in the former, perhaps because employers are in more of a hurry to get the trainees into jobs, and because relatively large numbers of apprentices leave the employer-led programs before they complete them.

One area where employer complaints about shortfalls in the supply of skills have unique credibility is with craft skills. Vocational education programs in high schools used to be an important source of workers with basic trade skills. But beginning in 1990, vocational courses declined precipitously, especially in comparison to the rise in other subject areas.

HIGH SCHOOL CREDITS BY SUBJECT AREA



SOURCE: National Center for Education Statistics Career/Technical Education Statistics

Within vocational education curricula, “industrial arts,” which includes skilled trades and other mechanical skills, declined even faster. The average number of credits taken per student in that subject area fell by half from 2000 to 2005. And the United States already had the lowest proportion of vocational education in secondary school education of any industrialized country. This appears to be the best evidence of something that has changed in the supply of labor to manufacturing.

A final explanation for employer complaints is the highly specific and idiosyncratic nature of contemporary hiring requirements. It is common to assume, for example, that a machinist’s job calls for a reasonably standard set of skills, but that is no longer the case. If job requirements across employers are highly specific and highly variable, the supply of workers is much more constrained than one might expect when employers are trying to fill

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those positions by hiring rather than training.

By the same token, applicants may find it very difficult to determine which skills they should acquire before applying for work. In the absence of good information about jobs and mobility, they may find themselves skilled but unemployed – or at least underemployed.

An obvious solution to virtually all the skills problems reported by employers is to increase training and produce the skilled workers they want themselves. But employers often express the view that they cannot afford to train employees for fear that they will be hired away at higher wages, a textbook recipe for an inefficient labor market.

SO WHERE DOES THIS LEAVE US?

The dominant skills problem in the United States, as in most developed economies, continues to be mismatches in which workers have more education than their current jobs require. Persistent high levels of unemployment and stagnant wages reflect the fact that job seekers still outnumber openings. While it is certainly true that employers would benefit from a larger (and therefore cheaper) supply of labor, it is hardly clear the country as a whole would benefit – and any claims to that effect should be examined carefully.

To the extent employer complaints represent something new, the best explanation is changes in employer practices, notably the decline in training and internal development and the associated rise in outside hiring for skills. The view that emerges from the skills-shortage and skills-gap arguments is that employers believe the responsibility for developing the needed skills is now the responsibility of job seekers and schools – not theirs.

Schools are not suited to organize work experience, the key attribute that employers covet. Nor are they necessarily good at teach-

ing work-based skills. Those skills are easiest and cheapest to learn in the workplace through apprentice-like arrangements that one finds not only in craft trades but also in fields like accounting and medicine.

At the post-secondary level, this shift in responsibility pushes risk onto students who pay tuition and give up earnings while they're in school. The employers who are calling for more STEM graduates, for example, are not offering to guarantee employment to students who are now starting such programs. Proposals like those in Florida would push students toward vocational majors by shifting state funds to college majors where employers say they want to hire (typically STEM fields) and away from majors where they do not. But governments are not particularly good at forecasting where jobs will be years in advance, and students and their families (along with taxpayers) would bear the costs when those forecasts are wrong.

If the labor market is not signaling students to pursue particular fields, does it make sense for government to take on the role? Manufacturers, for example, have long complained about the shortage of students interested in machinist-training programs, saying that guidance counselors were not advocating for those programs. But the pay for such jobs has declined by 20 percent in real terms over the past two decades, while the skills required for those jobs have shifted toward computer use – a field with better pay. Moreover, the number of machinists' jobs declined by 20 percent in that period, even as total employment rose by 40 percent, and is expected to decline further.

The reasons for the declining student interest in vocational education that could prepare them for manufacturing jobs merits further attention, but we should not assume that it is based on students' failure to read the incen-

tives correctly. If the government cannot become the staffing agency for employers, are we faced with a future in which employers are frustrated because they cannot find the specific skills they want while job seekers (especially those just finishing school) cannot get the skills that employers really want because no one will give them initial work experience?

Some employers may yet see the advantage of training their own workers, even if competitors stand ready to hire them away. We know that employers can provide skills training at minimal risk if workers' incentives are structured appropriately. But assuming employers lack the will to try, are there alternative ways of solving the problem?

The arrangements favored by the school-to-work movement in the 1990s may still have merit. In this model, the boundary between school and work was blurred. Employers helped schools to provide work-based learning that supplemented academic material and offered learning opportunities in the workplace that were not necessarily paying jobs. (Though, it should be noted that the Department of Labor has recently been cracking down on unpaid internships.) The employers' incentive to participate was the ability to identify promising students to hire before the students ever went on the job market, without investing heavily beforehand.

It is difficult to think of another labor-market issue in which rigorous research is so lacking, where parties with a material interest in the outcomes have so dominated the discussion, where the quality of evidence and discussion has been so poor and where the stakes are so large. The perspectives and interests of employees and students have been almost completely absent from these discus-

sions. There has been little testing of the assumptions behind arguments, and the costs and benefits of various proposals have not been considered. Note, moreover, that this dismal state of affairs seems to be unique to the United States.

One factor that has discouraged relevant academic research has been the lack of data about skills. The standard classification of job requirements into "knowledge, skills and

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abilities" reminds us that education, which has served as a proxy for skills in most discussions, only maps onto part of the "knowledge" category, leaving the other attributes of job requirements out of the picture. There are many good reasons for concern about education, but seeing it as the equivalent of skills is certainly a mistake. And one of the unfortunate consequences of using education as the proxy has been to distract from training and on-the-job experiences.

A final lesson from the current discussion of skills problems is that, in the absence of objective research findings, it is easy for advocates to make claims that even casual acquaintance with the evidence shows to be false. Perhaps the myriad organizations that have supported advocacy-oriented studies might yet be persuaded to support real research that answers real questions. 