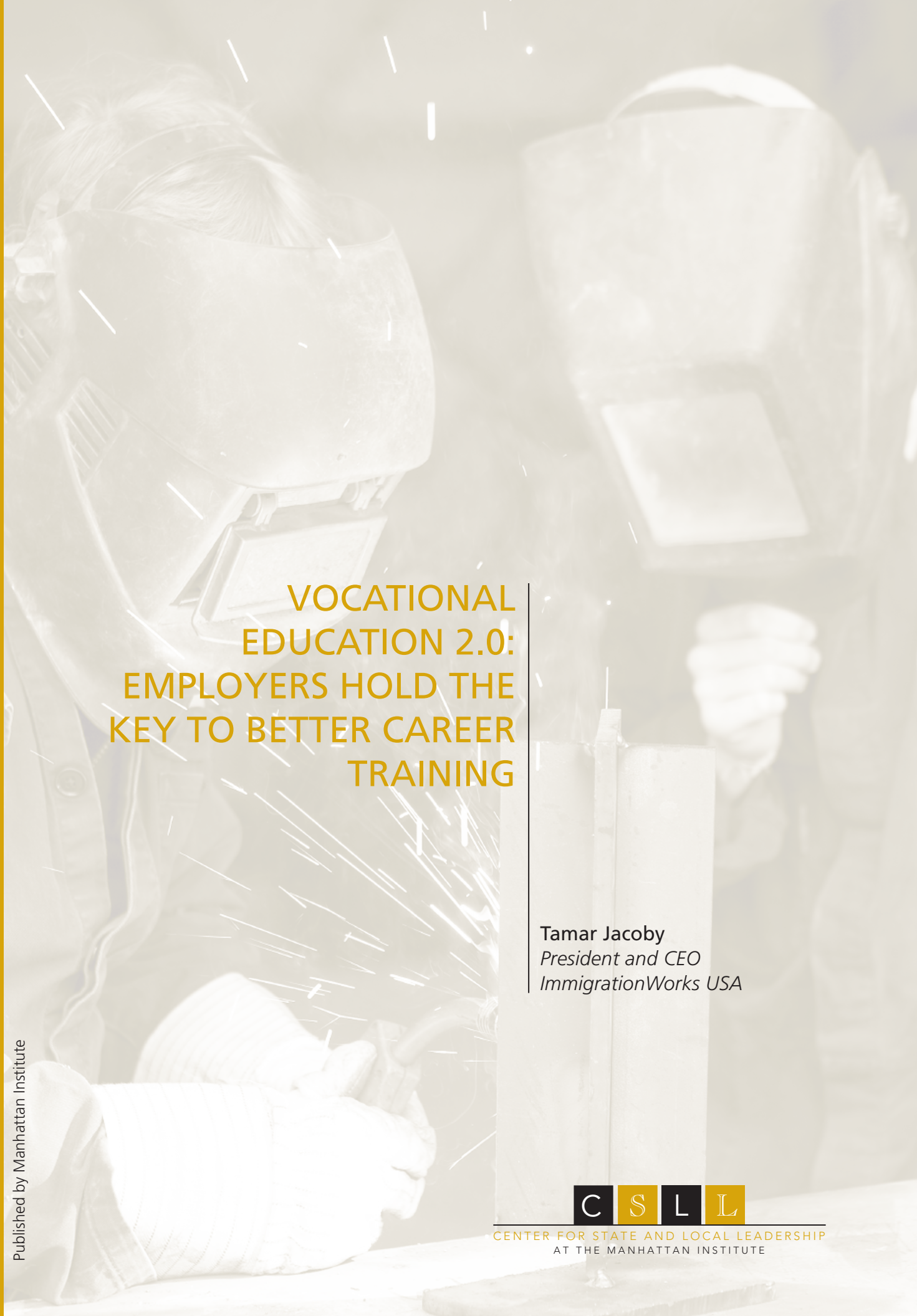
CIVIC REPORT
No. 83 November 2013



VOCATIONAL EDUCATION 2.0: EMPLOYERS HOLD THE KEY TO BETTER CAREER TRAINING

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Published by Manhattan Institute

CSL
CENTER FOR STATE AND LOCAL LEADERSHIP
AT THE MANHATTAN INSTITUTE

Executive Summary

Vocational education, long the stepchild of American secondary education, is enjoying a new vogue. With college debt soaring and youth unemployment stubbornly high, educators, employers, parents, and students are rethinking and, in several states, reshaping the options open to young people preparing for jobs in the middle of the skills ladder—jobs that require more than high school but less than a four-year college degree. The creative ferment is exhilarating, with strong intellectual underpinnings and a growing cadre of supporters. The all-important question for the future: Will it take hold—will it produce a new norm and a lasting transformation of American education? Much will depend on how seriously employers engage in the new experiment.

Voc ed is dead. The new term is "career and technical education" (CTE), and it's catching on in Washington as well as in the nation's leading education schools. But the new movement will not succeed unless technical training becomes a reliable route to skilled, well-paying jobs, and that will not happen unless American business engages in earnest.

Among the steps that the private sector must take for CTE to reach its full potential:

- Employers must recognize their responsibility to help prepare the workforce of tomorrow. It's not their job alone: the best programs are partnerships between employers and educators, and government can help. But there will be no meaningful change without business participation on a much broader scale.

- Among employers' most significant value-adds will be to develop training standards and occupational credentials. This is already happening, and already driving more and better training programs. But the effort must be expanded—more standards for more occupations with involvement by more industry associations—and standards must be maintained and regularly updated.

- The apogee of CTE preparation—the key component of the most effective programs—is on-the-job training combined with classroom learning. Sometimes called apprenticeship, sometimes dual training or craft training, the combination can be expensive and difficult to structure and maintain. But nothing works as well, and it's a proven long-term win-win—for trainees and for the employers who invest in them.

About the Author

Tamar Jacoby is president and CEO of ImmigrationWorks USA, a national federation of small business owners working to advance better immigration law. She is a nationally known journalist and author. Her articles have appeared in *The New York Times*, *The Wall Street Journal*, *The Washington Post, The Weekly Standard* and *Foreign Affairs*, among other publications, and she is a regular guest on national television and radio. Jacoby is the author of *Someone Else's House: America's Unfinished Struggle for Integration* and editor of *Reinventing the Melting Pot: The New Immigrants and What It Means To Be American*, a collection of essays about immigrant integration. From 1989 to 2007, she was a senior fellow at the Manhattan Institute. Before that, she was a senior writer and justice editor for *Newsweek*. From 1981 to 1987, she was the deputy editor of *The New York Times* op-ed page. This winter, she is launching Opportunity America, a center-right think tank and policy shop promoting social mobility and more equal opportunity.

CONTENTS

Vocational Education 2.0: Employers Hold the Key to Better Career Training

Tamar Jacoby

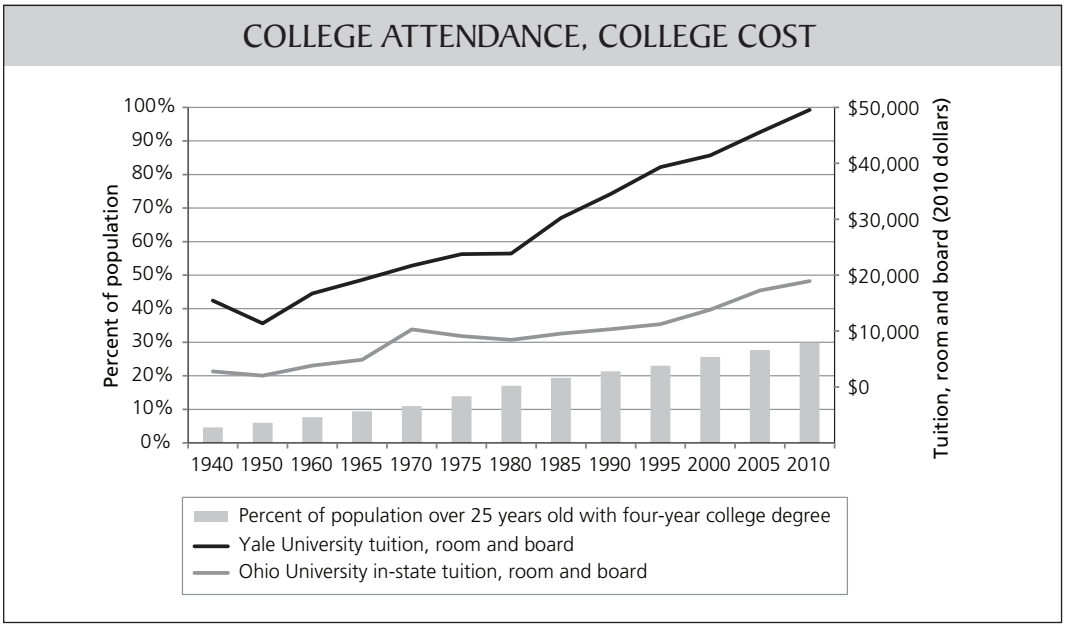
INTRODUCTION

Traditional vocational education has been in decline for decades. Born in the 1920s as Americans moved off the farm and as industry emerged as the engine of the U.S. economy, voc ed was once a respected path from school to work. Until the 1950s, many companies, large and small, drew their workforce directly from high schools: youth were trained at the employer's expense and expected to make a career with the firm. This practice began to change after World War II, when college emerged as the preferred route into a new, white-collar middle class. In 1940, only 4.6 percent of Americans held a B.A.; by the early 1970s, the figure had more than tripled.[1]

Voc ed fell from favor in the decades that followed, seen as a dead end or, at best, an inferior track. Few "shop" or "home ec" classes were intended to prepare young people for careers: in most schools, they were a dumping ground for less able students. The stigma only grew worse in recent decades as the concept of college-for-all took hold with a vengeance. The school standards movement, beneficial as it was for many, exacerbated the divide, as the 2001 No Child Left Behind Act and its champions preached the value of testing—tests geared entirely to college-readiness and academic standards—and resources followed test results.

Voc ed might have disappeared entirely if the college-for-all model, too, had not been fraying. College is still the default dream of the overwhelming majority of young Americans: even among high school seniors in the bottom quarter of their class, more than 90 percent expect to go to college.[2] But more and more Americans are starting to recognize that the dream no longer pays off as it once did.

Fewer than 30 percent of Americans complete a four-year college education.[3] Total U.S. student debt now tops $1.2 trillion, with 39 million young people owing an average of $24,803 and many facing

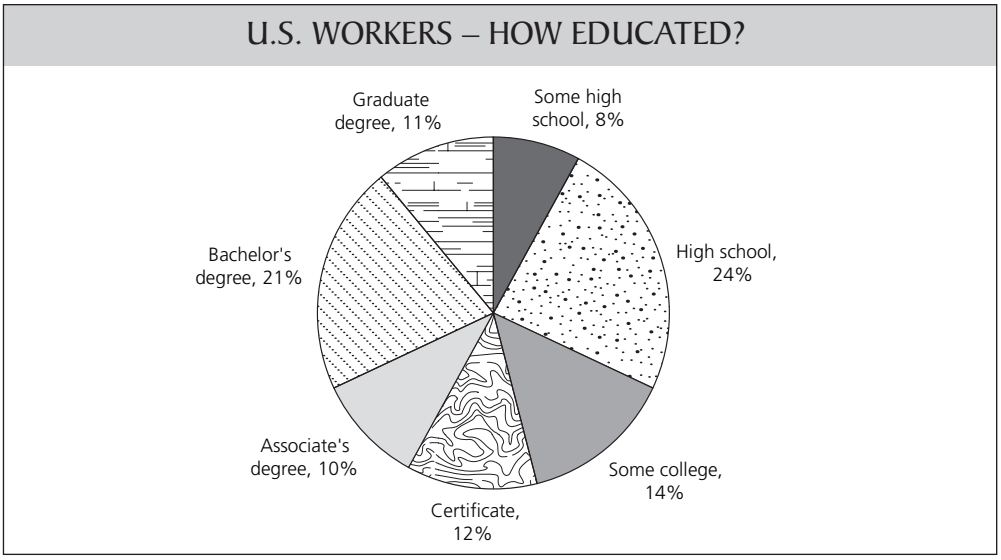


limited prospects in the labor market.[4] Liberal arts or general studies majors can expect a starting salary of $36,988—but often not in the field of their choice and often not promising to lead to anything better.[5] According to one stunning calculation by economists at Northeastern and Drexel Universities, in 2011, more than 50 percent of B.A. holders under 25 years old were out of work or underemployed.[6] Yet employers in a broad range of industries report trouble finding workers with the skills to fill open jobs.

Manufacturing, construction, and health care, among other sectors, report severe and growing skilled-labor shortages, even in recent years in the face of persistently high unemployment. According to a 2011 survey by Deloitte Consulting LLP and the Manufacturing Institute, 82 percent of manufacturing companies are experiencing a moderate or serious skills gap, with more than 600,000 jobs—a striking 5 percent of all U.S. manufacturing positions—unfilled at the time of the survey.[7] A broader 2011 sounding, by the ManpowerGroup, found more than half of all U.S. employers reporting difficulty filling jobs; the employers blamed applicants' lack of technical skills.[8] According to the Bureau of Labor Statistics (BLS), even with 11.3 million Americans out of work, there are 3.7 million unfilled job openings.[9] A common complaint from manufacturing human-resources departments: they place a job ad, and it results in 50 to 150 applicants, but no one who shows up is hirable because candidates lack the appropriate skills.[10]

Academic and industry sources agree that today's shortages are the thin edge of a wedge. The situation across the skilled sectors is going to get worse in years to come, particularly for what labor economists call "middle-skill jobs": a category that includes construction journeymen, skilled manufacturing operatives, licensed practical nurses, health technicians, and mid-rung IT work. According to the BLS, the two fastest-growing jobs in America are home health aide and personal care aide, together likely to account for 1.3 million new positions between 2010 and 2020.[11] According to Harry Holzer and Robert Lerman of the Urban Institute, jobs that require more than a little training but less than a B.A. account for close to half of all U.S. employment.[12] Anthony Carnevale predicts that 30 percent of the jobs created in the next five years will require less than a B.A. but more than a high school diploma—either an associate's degree or an occupational certificate.[13]

Under pressure from these realities, a broad range of thinkers have begun to question the college-for-all model. From conservatives such as Charles Murray and former secretary of education William Bennett to Silicon Valley entrepreneurs such as PayPal cofounder Peter Thiel, skeptics are challenging the



nation's reigning educational orthodoxy. What they dispute is not the idea of college or the value of a liberal arts education but rather the notion that *all* young people must aspire to a four-year degree, no matter what their interests or where their talents lie. The dissenters' most convincing argument: one size does not fit all—and the nation can no longer afford the mismatch between what students are learning and the economy's growing need for skilled labor.[14]

Into this breach—the space created by the dissenters—has sprung an unlikely coalition of educators and employers advancing a new model: career and technical education (CTE). The experimentation comes in many forms: CTE high schools, new investment in community colleges, industry-driven craft training, industry-sponsored occupational standards, career mentoring, internships, apprenticeships, and more.

New York City public schools have been in the vanguard: CTE programs have more than doubled under Mayor Bloomberg, and the P-TECH 9-14 "early college" high school developed in partnership with IBM has drawn national attention, including from President Obama.[15] Other much-watched experiments are taking place in Tennessee and North Carolina, where state agencies are pioneering youth apprenticeship programs.[16] High schools across the country are developing magnet schools with industry themes and trained CTE teachers. Other school systems from Florida to California are exposing younger and younger children to technical education and sophisticated STEM (science, technology, engineering, and math) skills. Brand-name companies in a range of industries are strategizing about how to maximize their investment in workforce development.[17] The National Association of Manufacturers has launched an ambitious effort to grant half a million occupational certifications by 2017.[18] The academic world is abuzz, producing papers and holding conferences. Two influential reports, from the Organisation for Economic Co-operation and Development (OECD) and the Harvard Graduate School of Education, have given the CTE movement new respectability, even as they spark expanded ferment and new activity.[19]

Marlene Seltzer, president of Jobs for the Future, a Boston-based nonprofit that has long been a leader in the field, captured some of the excitement at a recent conference: "Five or six years ago, this strategy sat on the margins of the discussion about education policy and education reform." Today, it's part of "the mainstream conversation. There has been a concerted effort to drive it … and it's gaining a lot of traction."[20]

THE PAYOFF TO CTE

The return to career and technical education is increasingly well documented. There are no authoritative measures of how many American students are pursuing technical education. According to the National Center for Education Statistics, 19 percent

of all high school students have earned at least three CTE credits in a single occupational area.[21] According to Carnevale, 18 percent of prime-age workers have obtained postsecondary certificates, but roughly one-third of them have gone on to earn additional degrees, often boosting them beyond mid-skilled jobs, leaving just 12 percent entering the labor market with only a certificate.[22] Another 10 percent of the workforce ended their education with an associate's degree, perhaps as many as half of them in a technical area.[23] And there are no reliable statistics on noncredit technical education—the kind delivered on the job or in noncredit craft-training programs.[24]

Much more is known about the benefits of CTE training. Not only do voc-ed students do better on most measures than traditional high school graduates; a number of studies show them besting young people who have attended college. The Association for Career and Technical Education tracks CTE "concentrators"—students who have completed at least three CTE courses—and finds that 90 percent finish high school, while only 75 percent of all freshmen do.[25] Students at CTE high schools who have completed four years of math and applied tech courses perform better than their high school peers on National Assessment of Educational Progress 12th-grade math and reading tests.[26] Those who have learned math by doing—exploring fractions with tape measures, for example, or working out how to calculate the volume of a cylinder when it comes up in automotive class—routinely do better on standardized math tests than other students, including in a 2006 "Math in CTE" randomized trial of 3,000 students in 12 states conducted by the National Research Center for Career and Technical Education.[27]

Labor-market returns are also encouraging. A study by the Hudson Institute compared associate's degree holders in the humanities and in CTE fields, and found that technical students earned, on average, $4,000 to $19,000 a year more.[28] Carnevale estimates that certificate holders earn, on average, 20 percent more than high school graduates with no postsecondary education.[29] Carnevale has also compared bachelor's and associate's degree holders and finds that 31 percent of those with associate's degrees are remunerated better than those with four-year degrees.[30] Perhaps most striking are several recent surveys of the return to licenses and certificates, both traditionally considered the bottom rungs of the youth-credentialing ladder. In fact, 43 percent of license and certificate holders earn more than peers with associate's degrees, and 27 percent earn more than the average B.A. recipient.[31]

The gains are even more pronounced in technical and business fields. In computer and information services, men with technical certificates earn an average $72,498 a year—more than 72 percent of the men in the field with associate's degrees and more than 54 percent of those with bachelor's degrees. In electronics, men with certificates earn $64,700—more than 65 percent of peers with associate's degrees and 48 percent of those with four years of college. In business and office management, women with certificates earn $38,204—more than 54 percent of those with associate's degrees and 41 percent of those with bachelor's degrees.[32]

Employers also report savings and benefits. Manufacturers, construction contractors, and other firms confirm that CTE students come to work better prepared than other high school graduates, including with the "soft" employability skills that can mean as much to a manager as technical prowess: critical thinking, problem solving, communication skills, personal discipline, and a strong work ethic, among other attributes.[33] Siemens USA spends several hundred thousand dollars a year to train youth apprentices at its new manufacturing plant in Charlotte, North Carolina, and CEO Eric Spiegel has no doubt that it's "a smart investment"—one that will pay off in the future with "long-term, highly dedicated, highly skilled employees."[34] According to a 2007 report by the Construction Industry Institute, every dollar invested in craft training produces between $1.30 and $3 in increased productivity, slower turnover, reduced absenteeism, and reduced "rework"—jobs done so poorly that they have to be done over.[35]

OBSTACLES

Whatever its advantages, CTE remains a fledgling movement, far from the mainstream of how most Americans think about education. The college-for-

all model is under fire, but in most people's eyes, it remains the royal road to a successful career. Most parents know little, if anything, about the new voc ed. To the degree that they have heard of it, it's generally seen as a second-tier option for low-performing students or at-risk youth—not *their* kids. Companies that run craft training and youth apprenticeship programs routinely report how difficult it is to persuade parents to consider them, even when they bring families into a plant and show them, say, the reality of modern manufacturing—all robots and lasers and computerized controls.[36] As the Harvard Graduate School of Education's seminal 2011 report "Pathways to Prosperity" put it, twenty-first-century CTE is still a "well-kept secret."[37] The "Pathways" report has done more than any other effort to spread the secret nationally, enhancing the credibility of CTE and creating space for new initiatives. But the movement is still in its infancy—a string of promising experiments.

The obstacles to growth and, just as important, to mainstreaming the concept fall into two baskets: cultural and technical.

As any parent can tell you, Americans reject "tracking"—we see anything that reeks of class or caste as an unacceptable affront to one of our core values: equality of opportunity. Career and technical education doesn't have to entail tracking. Indeed, most proponents argue that, far from pigeonholing or restricting students, it provides alternatives, usually choices otherwise unavailable. In many CTE advocates' view, American secondary education is already tracked: there's one route for privileged kids and another for the less privileged—we just don't admit it.[38] "What these youth need are options," a seasoned voc-ed teacher at a construction craft training center told me about his students. "By making high school education all abstract teaching and all academic subjects all the time, we've locked ourselves out of a critical option—learning by doing."[39]

Whatever supporters say, most Americans are skeptical. It was no accident that the last push for CTE—the Clinton-era School-to-Work movement—eventually petered out, as modest federal funding was exhausted and old, ingrained public attitudes toward education reasserted themselves. In the 1990s, there was no strong constituency for voc ed. Skilled-worker shortages were not yet apparent. And when No Child Left Behind emerged, the standards movement that it spawned all but eclipsed experiments with youth apprenticeship and technical training.[40]

Today's CTE proponents have learned from the failure. Few underestimate the power of college-for-all, and many approach the issue with sophisticated arguments blurring the distinction between voc ed and academic preparation. They talk about CTE as an "on ramp" to college.[41] They emphasize how technical training helps enhance students' academic skills and standardized test scores.[42] The National Association of Manufacturers is mounting a major effort to move craft training into community colleges and make it easier for students to get college credit for technical instruction.[43] Melissa Silberman, who oversees CTE in the New York City public schools, explains: "We're not saying that CTE students don't graduate college or we don't want them to go on to college…. It doesn't mean they must become an engineer or must go into fashion. It's about exposure to careers and the workforce [and] getting them on a path to success—one that may ultimately include a bachelor's or associate's degree."[44]

Other CTE advocates are skeptical that the trade-offs can be finessed this easily. "It's about opportunity costs," said one veteran voc-ed teacher. "If you put all your resources into X, you're going to miss Y—especially if Y is a blue-collar culture of trade and craft that commands little respect in America today."[45] These warier proponents believe that the future depends on sharpening the choice between college and voc ed and that the nation will ultimately have to think harder about educational spending and priorities.[46] Whichever champions are right, the cultural challenges are formidable.

Meanwhile, technical challenges are also emerging. The most pressing: quality control. A 2013 assessment by the OECD has caused almost as much of a stir in CTE circles as the groundbreaking "Pathways to Prosperity" report did a few years ago. The latest

in a series of OECD studies emphasizing the value of vocational education, the "Skills Beyond School Review of the United States" mixes high praise with stinging criticism. Surveying the ferment of the past few years, the authors see an environment of "exceptionally rich" innovation and "exciting" policy development. But they are also deeply troubled by what they politely call the "decentralization" of the new movement: the variability of programs, the uneven quality, the lack of national standards, and the lack of accountability.[47]

Leaders of the American CTE movement do not disagree.[48] The new experimentation layered on top of old programs has produced a baffling array of venues for CTE instruction: community colleges, for-profit colleges, high schools, company-run training programs, union-run training programs, ad hoc online courses, and more. Certificates often mean little or nothing. It can be hard to know if a given credential is a certificate of achievement—or simply attendance or completion of a CTE course.[49] Students are paying for classes and taking on debt but often can't be sure that the training will lead anywhere.[50] The difficult question is what to do about this rich but sometimes dysfunctional ferment—what one researcher has called a "Wild West of programs"—particularly in a culture like that of the United States, which is suspicious of regulation and credentialing.[51]

A JOB FOR BUSINESS

There's no single answer—no magic bullet. CTE researchers want more data. Some want more involvement by the government. "Transparency" is a much-used term.[52] Several thinkers, including Charles Murray, have floated thoughtful suggestions for measuring whether young people entering the workforce have the skills that employers need.[53] Others talk of a new system of federal approval or accreditation.[54] Meanwhile, more and more CTE advocates are looking to the business world—after all, more business involvement would solve many problems.

Who better than employers to set standards? Not only do companies know exactly what skills they need in the workplace; they're also far more likely than educators to be aware of how those skills are changing and how CTE training should change to keep up. At a time of record deficits and revenue-neutral budgeting, employers are a natural source of funding for vocational training. Perhaps most important, only employer involvement can guarantee the bottom line that is most important to students: that CTE training actually lead to a job. Unless and until it does, voc ed will never be as good a choice as college.

The challenge: how to spur employer involvement on a scale that would make a difference. Some employers are already stepping up: much of the experimentation of recent years has been driven by companies and trade associations. But CTE researchers are divided about the depth and extent of business commitment.

One survey, now over five years old, suggests that only 20 percent of U.S. employers feel that it's their responsibility to train future workers.[55] Researchers who gathered this summer in Washington to discuss the new OECD report were more sanguine, convinced that big companies, particularly in the STEM fields, are prepared to do their part.[56] Vocational educators on the ground, where training takes place, tend to offer a mixed view: some are excited about the companies they're working with, and others are concerned about what they say is, at best, spotty engagement.[57] Merrill Pond, senior vice president of research and policy at the Partnership for New York City, which has played a critical role in finding business partners for the new generation of New York CTE high schools, reports that the companies she works with are eager to get involved but often have little idea about exactly what that entails or what it would take to make a difference.[58]

Few questions will be more important for the future of career training and, by extension, for American competitiveness: How actively and to what extent will U.S. employers shoulder a new responsibility to train the workforce of tomorrow?

THE GOLD STANDARD

Most conversations about career and technical education lead eventually to a discussion of the European

apprenticeship system. In the eyes of most experts, it's the gold standard of training practices and quality control—and, not incidentally, it's a system built on a foundation of employer involvement.

Several countries in northern Europe as well as Australia and Canada have extensive apprenticeship systems.[59] Switzerland's is thought to be one of the most effective; Germany's is the best known. The core element and defining hallmark is the concept of "dual training." Young people spend some time in the classroom and some time—generally at least half the week—on the job in the workplace, participating in the production process and solving real problems under the supervision of a working mentor.

The German dual system prepares young people for nearly 350 occupations: from hairdresser and kitchen worker to advanced manufacturing technician and banker.[60] Both classroom work and on-the-job learning are highly regulated: companies, labor unions, trade associations, and the government—state and federal—collaborate to devise highly specific job profiles and training curricula.[61] Some 60 percent of German youth enter the workforce through apprenticeships, most going straight to dual training rather than to university.[62] Twenty-two percent of German firms participate in the system, committing to train young people for at least two years, and sometimes nearly double that, in the hope that they will eventually make a career with the company.[63] In most cases, it works: some 60 percent of apprentices are offered permanent employment at the firm where they train, while the overwhelming majority end up working in the same field.[64]

German apprenticeships are widely touted as a triple win—for trainees, trainers, and the national interest.[65] Business gets a highly trained workforce, armed not just with general skills and broad vocational preparation but ready to start at a specific skilled job and comfortable with the company culture. The nation holds down youth unemployment, currently 7.5 percent in Germany—compared with 16.3 percent in the U.S. and over 50 percent in parts of southern Europe.[66] As for participating youth, they learn skills. They make money while they learn. There's a direct path to a real job, and even if they don't end up signing with the firm that trains them, they walk away with a nationally recognized certificate that they can use to get a job elsewhere.

The program is not for at-risk youth. On the contrary, the application process is highly competitive. German students are tracked from an early age, attending either vocational or academic high schools. Apprenticeships were originally designed for the vocationally minded; but in recent years, graduates of better schools have also been flocking to dual training.[67] Less than half of the 1.6 million youth participating today come from a vocational high school, and banking and IT apprenticeships, among others, are seen as highly prestigious—on a par with university.[68]

Just why apprenticeship works as well as it does is a more complicated issue. The OECD has strongly endorsed dual training; the "Pathways to Prosperity" report holds it up as an exemplar.[69] Urban Institute scholar Robert Lerman has studied it extensively and now champions it in the United States.[70] These and other researchers and practitioners agree that the key ingredient is the opportunity for work-based learning—not just classroom study, not skills taught out of context in a lab or shop, not casual exposure to a profession, and not one-on-one mentoring, valuable as these elements may be, but the actual real-world experience, on the job, where it counts.[71]

Why is it so important that the training be on location in the company? According to the "Pathways to Prosperity" study, that's the best way to close the gap between classroom teaching and workplace needs, ensuring that "work and learning are integrated"; the "learning is contextual and applied."[72] Apprentices do real assignments. They learn not just skills but also work habits. With time, they acquire what Lerman calls "occupational mastery"—a kind of competence that cannot be taught in a classroom.[73] Employers can be counted on to ensure that training is up-to-date and relevant, using the technology of today, if not tomorrow. But there's also something intangible, trainers say: a different level of intensity and expectations associated with the all-but-certain

FASTEST GROWING JOBS 2010–20

Jobs requiring vocational education make up 18 of the top 30 fastest growing jobs

	Job title	Change in employment 2010–20		Median annual wage 2010	Education level needed
		Number (thousands)	Percent		
1*	Personal care aides	607.0	70.5	$19,640	Typically less than high school, but some states require formal training, and agencies reimbursed by Medicare or Medicaid require state certification or a competency test
2	Home health aides	706.3	69.4	$20,560	Typically less than high school, but some states require formal training, and agencies reimbursed by Medicare or Medicaid require state certification or a competency test
4	Brickmasons', blockmasons', stonemasons', and tile and marble setters' helpers	17.6	60.1	$27,780	Typically less than high school, but some attend trade or vocational school or community college, then apprenticeship or on-the-job training
5	Carpenters' helpers	25.9	55.7	$25,760	Typically less than high school, but some attend trade or vocational school or community college, then apprenticeship or on-the-job training
6	Veterinary technologists and technicians	41.7	52.0	$29,710	Technicians require a 2-year degree, technologists a 4-year degree and most states require a license or certification
7	Reinforcing iron and rebar workers	9.3	48.6	$38,430	High school diploma or equivalent, then apprenticeship or on-the-job training
8	Physical therapist assistants	30.8	45.7	$49,690	Associate's degree and license
9	Pipelayers', plumbers', pipefitters' and steamfitters' helpers	26.3	45.4	$26,740	Typically less than high school, but some attend trade or vocational school or community college, then apprenticeship or on-the-job training
11	Diagnostic medical sonographers	23.4	43.5	$64,380	Associate's degree or bachelor's degree, then professional certification
12	Occupational therapy assistants	12.3	43.3	$51,010	Associate's degree and license
13	Physical therapist aides	20.3	43.1	$23,680	High school diploma or equivalent and on-the-job training
14	Glaziers	17.7	42.4	$36,640	High school diploma or equivalent, then apprenticeship or license
16	Medical secretaries	210.2	41.3	$30,530	Associate's degree
19	Brickmasons and blockmasons	36.1	40.5	$46,930	High school diploma or equivalent, then apprenticeship, technical school or on-the-job training
21	Dental hygienists	68.5	37.7	$68,250	Associate's degree and license
22	Bicycle repairers	3.7	37.6	$23,660	High school diploma or equivalent and some on-the-job training
25	Stonemasons	5.7	36.5	$37,180	High school diploma or equivalent, then apprenticeship, technical school or on-the-job training
29	Pile-driver operators	1.5	36.0	$47,860	High school diploma or equivalent, then apprenticeship, technical school or on-the-job training, and some states require licenses

Source: Employment Projections program, U.S. Department of Labor, U.S. Bureau of Labor Statistics
*Numbers 3, 10, 15, 17, 18, 20, 23, 24, 26, 27, 28 and 30 are jobs that require a bachelor's, master's, or doctorate degree.

path to a job.[74] Both employer and trainee view the process differently when they have skin in the game: when training is likely to lead to employment, it raises the stakes for both parties.

Can the European apprenticeship model be replicated in the United States? Most researchers agree that it's hard to see Americans importing it wholesale; more likely, they will adapt it or its best features.[75] Deep-seated cultural differences separate the U.S. from Europe. Everything about the German dual system is highly regulated—from what should be taught, when, how thoroughly, and exactly what will be included on final exams. In Germany, business and labor work together as trusted partners, with little of the rancor that characterizes labor relations in America. There is no litigation culture and little liability associated with bringing underage youth into the workplace. Many, if not most, young Germans still aspire to find a job for life: they, as much as the companies, are eager to commit for the long term. This is rarely true today in the U.S.

Yet for all the differences, there is clearly much to be learned from the European model.

A SUCCESSFUL BUSINESS-DRIVEN PROGRAM

U.S. employers in several sectors are deeply concerned about the gap between school and work, and many are working to come up with solutions.

The hospitality industry was one of the first to step up, starting in the Clinton era, when the National Restaurant Association took advantage of federal incentives to fund a youth training campaign that combined class time with on-the-job experience. The idea emerged first in Chicago among a small group of restaurateurs concerned that the "home ec" classes in local high schools were doing little or nothing to prepare the workforce that restaurants needed.[76] The founding group persuaded their state restaurant association to try an experiment: 100 students in six schools in the Chicago area in 1997. A year or so later, when the group learned that the federal government was making money available for School to Work programs, they enlisted the National Restaurant Association and won a million-dollar grant from the Departments of Education and Labor.[77] But just as the initiative hadn't used public money to get started, so it survived—indeed, flourished—when the federal dollars stopped. Today, the ProStart program stands as an exemplar of what business can do and a window on the opportunities and challenges facing U.S. employers concerned about job training.

Now entering its 17th year and a venerable institution in the restaurant industry, ProStart trains 100,000 students a year in 48 states.[78] According to industry champions, it is the nation's largest employer-sponsored youth development program.[79] Participating students come from high-end suburbs, inner cities, military bases, and Indian reservations—a broad gamut of American youth.[80] Like a European-style apprenticeship, the program combines classroom learning with hands-on work in a restaurant or food-service company.

The courses are electives taught in high schools: two years of classes meant to be integrated into a broader, academic course of study. A proprietary curriculum, developed by industry experts working with an international textbook provider, the Pearson Learning Company, covers culinary skills and management—everything from "kitchen essentials" to safety, sanitation, cost control, and customer service.[81] Local restaurateurs are recruited as guest lecturers, to give demos, host restaurant tours, and donate equipment. State restaurant associations work with the National Restaurant Association Educational Foundation (NRAEF) to recruit teachers and maintain quality control: participating schools must buy and use ProStart curricular materials, local teachers receive training and detailed lesson plans, and the school must administer the program's set final exams.[82] Students who complete the courses receive certificates recognized across the industry and by some 60 postsecondary culinary programs, from Le Cordon Bleu to community colleges.[83]

A number of brand-name U.S. restaurant and food-service companies participate in ProStart. The Brinker and Darden chains are major support-

ers, contributing through the National Restaurant Association and the NRAEF.[84] Other companies, including Disney, donate kitchen time and equipment—one of the main expenses associated with the program.[85] In 2012, the foundation spent $4.6 million on ProStart—and that did not include state restaurant association spending or the $1.4 million in scholarships for further culinary and restaurant-management training contributed by companies and postsecondary schools.[86] According to restaurateurs who participate, the total cost of the program might be as much as twice the NRAEF budget line.[87]

What has proved hard to organize is the work-based learning—time on the job in the companies. The goal is 400 hours in a restaurant doing hands-on work with a mentor. As in a German apprenticeship, this component is structured—in this case, by the restaurant industry, with a range of topics that must be covered.[88] Students who complete the required work experience earn an additional, more prestigious, certificate.[89] Some companies participate enthusiastically, including several major national chains. But worksite placements vary widely from state to state. Overall, well short of the 100,000 students who participate in ProStart complete 400 hours on the job.[90]

Where students do get practical experience is in the annual competitions. Arguably the heart of the program, these are tournament-like contests that start in the states and culminate at an annual national "invitational."[91] Students prepare for months in teams of four or five. Those competing in culinary arts must cook a three-course meal in 60 minutes, using just two butane burners and no running water or electricity. For the parallel management-skills contest, teams develop an original restaurant concept—menu, decor, signage, marketing, budget, and the rest—and must prove themselves on their feet, coping with a hypothetical management crisis. Judges at the state and federal competitions include some top names in the business—chefs and company executives.[92] The students are disciplined and focused—cooks are in full chef regalia—and the competition is intense. Winners take home scholarships to the top culinary schools in the country.[93]

There are few metrics assessing ProStart, and industry champions are pressing for more rigorous evaluation.[94] But existing measures suggest that the program achieves its primary goal: exposing young people to the restaurant industry and interesting them in future careers. Five years after receiving a certificate or competing in the national competition, eight in ten participants are working in the industry or completing studies in the field.[95]

The broader takeaway for CTE policy and planning is that if programs are organized properly, American employers will step up. Companies will participate, often on a significant scale. National and state trade associations will set standards and produce up-to-date industry curricula, just as they do in Europe, but without government regulation. Perhaps most important, when employers build it, young people will come. If ProStart participants feel a stigma, it's certainly not apparent at the competitions—it's hard to imagine a prouder or more engaged group of young people.[96]

The challenge for ProStart and other U.S. programs: getting more young people into the workplace for on-the-job training. ProStart champions in the restaurant industry see this as an important next step.[97]

THE POWER OF INDUSTRY STANDARDS

Another employer experiment, in the construction industry, teaches other lessons about how American business can be engaged in craft training.

The construction industry is chronically short of workers and has been for decades. Though frequently better-paying than other mid-skilled work, construction's physically taxing, often outdoor jobs have grown less appealing as Americans have become better educated. A steep boom-and-bust cycle makes it hard to retain workers over time. Although the industry is increasingly computerized—generally a draw for job seekers today—many young people don't know this about construction and shun what they see as dirty, dangerous work that leads nowhere.[98]

Until the 1990s, the most common route to construction craft training ran through an apprenticeship program, often organized by a labor union or a union working with an employer.[99] American apprenticeship programs differ in a number of ways from those in Europe. American apprentices are typically older than in Germany: the average age is 30, rather than 16 to 19. Though many programs are registered with the government and overseen by state and federal agencies, training is generally less academically rigorous, with class and workplace learning less well integrated than in other countries. Employers with contracts on government projects are often required to participate in registered apprenticeships, but many avoid them—and shun government work—because of the heavy union involvement. Union officials are overrepresented on the state and federal boards that oversee the programs. Requirements that employers see as union-driven—for extensive record-keeping or a fixed number of highly paid trained workers who must oversee each apprentice—make participation unwieldy and expensive.[100] The industry reaction: beginning in the 1990s, construction employers began to develop their own, unregistered training programs.[101]

NCCER, once the National Center for Construction Education and Research, began as an ad hoc group of 125 CEOs and trade association executives who came together to support alternative safety and craft training, unregulated by the government and free of union involvement.[102] The organization provides no classes and no on-the-job learning, but it drives a vast training effort across the U.S. and internationally by setting industry standards and keeping track of the workers who meet them.

NCCER publishes curricula, developed by skilled practitioners working with academic experts, for the study of some 60 crafts, from welder to pipe fitter to mobile crane operator. Courses are delivered—during the day and at night—by a broad range of accredited NCCER providers: community colleges, high schools, companies, employer associations, and cooperatives of smaller companies that can't afford training programs of their own. As important as the curricula are NCCER assessments: rigorous, industry-driven, standardized tests also administered locally by any provider with NCCER accreditation—now more than 4,000 nationwide. Workers trained or tested with NCCER materials receive nationally recognized credentials: transcripts, certificates, wallet cards, all tracked through an online registry and seen as indispensable for employment in much of the construction industry.[103]

The power and reach of NCCER is hard to overestimate, as I learned on a visit to a construction craft training center in Corpus Christi, Texas. Allied with a local affiliate of the Associated Builders and Contractors and located in several big industrial buildings on the outskirts of town, the Craft Training Center of the Coastal Bend trains adult apprentices and high school students for jobs in the region's oil and gas refineries—mostly welders, plumbers, electricians, and pipe fitters.[104]

The facility has a long history: the brainchild of a half dozen contractors who do high-risk maintenance and other work in the refineries. They tried partnering with a community college to provide training. When that fell through, they turned to nearby high schools, but no school could afford to offer classes. Even with help from the refineries, it wasn't easy to raise money. The key to the center's success was ultimately personnel: the contractors found a savvy and resourceful local vocational educator to run an independent program. But she would never have succeeded without NCCER curricula to structure the instruction and guarantee its relevance to employers. Every worker her team trains, adult or high school student, comes out of the program with an NCCER card and a transcript searchable in the national registry—an imprimatur that puts the center on a par with far more established training programs and all but guarantees her graduates a shot at local jobs.[105]

Inspired by NCCER and other programs like it, the National Association of Manufacturers (NAM) is now mounting a major national effort to guarantee credentials and spark training in a wide range of crafts in demand by U.S. manufacturers. The NAM-endorsed Manufacturing Skills Certification System gives the association's stamp of approval to some 16 credentialing systems run by NCCER and other trade

groups in the machining, welding, engineering, mechatronics, IT, and logistics fields, among others. All the credentials are employer-driven, widely recognized in their industries, and validated by the respected American National Standards Institute. Credentials are "stackable": for every trade, there's a course of study that starts with workplace basics and ascends through rudimentary STEM skills to advanced craft training. NAM expects courses to be taught primarily in community colleges and is encouraging this by recognizing and endorsing qualified schools. There is no on-the-job component: in NAM's vision, the manufacturing companies that hire certified workers will then do their own specialized on-the-job training. In 2011 and 2012, the network issued 173,289 certifications, and, by all accounts, U.S. manufacturers are eager to hire recipients.[106]

THE NEXT STEP

Most American employers and employer associations are just beginning to address CTE. But already, a pattern is emerging. Frustrated by poorly prepared workers, spurred by ever more sophisticated technology and workplace safety concerns, employers in a range of sectors are recognizing the need for better training. Businesses large and small are banding together to act, sometimes to offer training, but more often—so far—to produce curricula and standards.

This is a critical first step. As the NCCER experience shows, curriculum and standards will help spark the creation of training programs: the NAM standards are already driving community colleges to offer more meaningful CTE courses.[107] Just as important, nationally recognized employer standards are one of the best ways to tame the Wild West chaos described in the OECD U.S. report—without government interference and the often burdensome regulation that comes with it.

As the OECD recognizes, bottom-up employer-driven standards have a number of advantages over top-down government standards. Certainly, the American employer-driven model is more flexible and more timely than what happens in Germany, where business, labor, employer associations, and the state often take years to revise a craft training profile or curriculum.[108] With employers in charge, standards are more likely to keep pace with innovation. An employer imprimatur will help students decide what training is worth investing in—and will reassure donors, public or private, stepping up to fund programs.[109]

But standards, top-down or bottom-up, are only the beginning of what's needed. Still missing are company-provided youth training programs on a scale that would make a difference—particularly work-based learning and on-the-job training.

APPRENTICESHIP IN AMERICA

Among the most important questions for the future: Will the idea of youth apprenticeship take off in America? Few other forms of CTE engage employers as intensively, and few offer the same direct path to a skilled, well-paying job—the only kind of opportunity likely to be as compelling as college.

An array of apprenticeship programs already exist in the U.S., some spawned by the Clinton-era School-to-Work movement, many run by unions and business-labor partnerships, plus a new generation spurred by the OECD and Harvard reports. Some 21,000 programs are registered with federal or state authorities. No one knows how many more operate informally, but estimates suggest that together, they might serve more than a million youth.[110] In 2006, the Department of Labor surveyed 947 employers with registered apprenticeships and found them more than satisfied: 97 percent said that they would recommend apprenticeship to other employers, 86 percent would "strongly" recommend it, and the overwhelming majority found it an effective hiring tool.[111] But only a small percentage of American youth participate in dual training.[112] The number of registered apprenticeships has seen little growth in the past decade, and many of the newest experiments are being driven by German companies with operations in the U.S.[113]

Today, as in the past, state and local governments have taken the lead in midwifing apprenticeships, helping

companies take the first step and matching them with educational institutions. Michigan governor Rick Snyder traveled recently to Germany and came back an enthusiast, spurring the Michigan Economic Development Corporation to initiate a program for some 30 youth working at nine companies, most of them German, in southeast Michigan.[114] Tennessee authorities working with a nonprofit organization associated with the Harvard "Pathways to Prosperity" study have generated a cluster of programs, several at manufacturing plants in the Chattanooga area.[115] There's another flourishing project in Charlotte, North Carolina—again, mostly foreign companies, but also the big U.S. bearing manufacturer Timken.[116] One of the most active and successful state facilitators, Apprenticeship Carolina, demonstrates what local government can do to help. The office works with the state's technical college system to tailor instruction to employer needs; there is also a tax incentive, free consulting, and technical assistance for participating companies.[117]

One of the most successful apprenticeship programs in the United States is run by Siemens USA at its mammoth manufacturing plant in North Carolina. The experiment has attracted considerable attention and admirers, including President Obama, and it's a telling window on how one European company deals with the challenges that stop many American firms from experimenting with dual training.[118]

It hasn't been easy even for Siemens. The company consolidated its North American gas and steam turbine production in Charlotte in 2011, lured in part by state tax incentives and a commitment by a local community college to collaborate on dual training.[119] Ten other European companies with facilities in North Carolina had come together several years earlier to launch a consortium called Apprenticeship 2000, so the concept was familiar in the area. Still, the local high school initially refused to take part—teachers and counselors wanted their students to go to four-year colleges—and local parents were intensely reluctant, for the same reason.

Siemens and Central Piedmont Community College worked together to craft a rigorous German-style program. Students are recruited in their junior year of high school (the school finally agreed to help in 2012 when Obama mentioned the Siemens program in the State of the Union). It's still an uphill fight to convince many families, and the company invests heavily in recruitment. But the program is also highly selective. Students must meet exacting grade requirements; there is an extensive battery of interviews and tests and a six-week trial internship between the junior and senior years. Students who survive the gauntlet sign a four-year contract. They split their time between the college and the shop floor, earning $9 an hour no matter where they are. Trainees who complete the program earn an associate's degree in mechatronics plus a journeyman's license and a guaranteed job at Siemens, although they are under no obligation to stay with the company.

Two years later, Siemens executives, including the U.S. CEO, are among the nation's leading proponents of apprenticeship, writing op-eds, giving TED talks and making the case in the media.[120] Meanwhile, the company shrugs off three of the biggest obstacles that deter American companies from hiring youth apprentices.

First, many U.S. employers hesitate because they fear that trainees will not stay with them: competitors will "poach" skilled employees, or restless young people will move on.[121] Siemens and other Apprenticeship 2000 firms seem relatively unconcerned by either prospect: they have an informal commitment not to steal from one another and are more familiar with the kind of worker loyalty that can be created by a good apprenticeship program.

Second, a huge barrier for American companies, particularly construction contractors, is the liability to lawsuits that comes with on-the-job training for youth: the Occupational Safety and Health Administration (OSHA) imposes strict limits on where young people under 18 can work and excludes most construction and manufacturing shop floors.[122] Siemens grappled with this issue head-on, paying apprentices through a temporary agency. The company and the high school also take out insurance for working students, who are required to complete an OSHA safety-training course.

Third, and perhaps most daunting for American companies considering apprentice training, is the cost: at Siemens, $170,000 per student. But the German firm is more than convinced that its investment will pay off. It sees apprenticeship as a way to save on recruiting costs. Dual training also limits what the company spends on employee error, and it reduces turnover—just 2 percent a year at the Siemens North Carolina plant. A human-resources manager there explains the company's thinking: "You can't look at it as $170,000. Look at how expensive it would be not to have a labor force."[123]

TAKEAWAY

The new CTE movement is spawning a vibrant literature and a long trail of recommendations for how the new voc ed should grow, improve, and assess itself.

The National Governors Association has a list of suggestions for how state governments can spur effective programs: use the bully pulpit to promote CTE, improve the quality of CTE teaching, and include the skills that employers want in state educational standards, among other ideas.[124] The "Pathways" authors' Boston-based nonprofit coordinates state experiments and develops what they call "intermediary organizations"—local private-public partnerships that broker relationships and provide technical assistance for schools and businesses.[125] Robert Lerman's policy recommendations start with the White House: he believes that the president should make apprenticeship a national priority. Lerman also looks to state government: agencies such as Apprenticeship Carolina that can market dual training to businesses, match employers with educators, and respond to employer questions with real-time technical advice.[126]

The OECD, among others, focuses on better assessment and quality control. The 2013 OECD report proposes a government "hallmark" or imprimatur for industry-driven craft certifications—not a top-down government-run system but a voluntary seal of approval for industry standards.[127] Other thinkers who focus on standards want educational credentials more closely linked to employer needs.[128] Still others want better measurement of outcomes in the job market.[129] Another cluster of recommendations focuses on teacher training and guidance counselors.[130] Virtually everyone in the field has ideas about how to use government spending to spur more programs.

Another way to think about spurring change starts not with government, middlemen, or educators but with employers. Construction industry insiders draw an apt analogy: the revolution in construction safety standards that occurred in the late 1980s and early 1990s. What made the difference, according to those who witnessed it: construction owners—not the contractors, but the companies that own and manage facilities and capital improvement projects—insisted on change. "It wasn't OSHA," one insider explains. "It was the owners who were paying for the work, paying for bonding and insurance. They said, 'We know you can do better—we demand better.' And contractors responded, with the results you see today."[131]

If we start from the premise that the Number One goal is more intensive employer engagement, a number of recommendations follow:

It's a business responsibility. A variety of companies are taking an interest in and experimenting with CTE programs: national restaurant chains, construction contractors, major manufacturers, and IT giants such as Siemens and IBM. Still, most American employers do not yet see the next-generation workforce as their problem or their responsibility. How to change this? There's no easy answer, and the strongest incentives will come from within: labor shortages, technological change that requires better skills, industry champions who motivate others. But there can be little question that this is where change must start. This is the engine that will drive a lasting transformation of technical education, and a first goal must be to create a new sense of urgency and accountability in the business world.

A pipeline for workers. Employers sponsor CTE programs for various reasons including as a way to engage and give back to the community, or as a way to expose young people to an industry in the hope of sparking interest in further study. These motives

can drive change. But as German apprenticeships demonstrate, employers and young people both take training more seriously when it's actually a stepping-stone to a job. Businesses are more likely to invest, standards are more meaningful, training is more substantive, and students are more likely to apply and enroll. Apprenticeship is not the only way to raise the stakes by ensuring that training leads eventually to employment. But the closer that CTE is tied to hiring—the more companies and transitioning students depend on it for real employment outcomes—the better, more meaningful, and more widely available it will be. Ultimately, this is the only way to make CTE as appealing as college: it has to be a path to a good job.

Who should pay and for what. Cost isn't always an obstacle for business, according to the Partnership for New York City. Working with a city high school to inform a CTE curriculum isn't particularly expensive or time consuming.[132] But for most companies, return on investment is a major concern, and work-based learning that leads to a job can be costly. Tax incentives can help, but mainly on the margins—few companies will engage on a significant scale unless they feel that it's in their interest for other, more substantial, reasons. One potential way for government to make engaging easier for employers: direct adequate funding to educational institutions—whether high schools or community colleges—that can partner with business to provide effective CTE training.

Standards and accountability. Advocates who focus on metrics are surely right: there can be no meaningful change until there are better ways to measure outcomes. What training leads to a job? What programs are most successful in preparing young people for jobs? What training is best linked to employer standards? What curricula are changing most effectively to keep pace with changing labor needs? As NCCER and the new NAM-endorsed standards show, trade associations and industry representatives can a play a critical role in setting standards for CTE training. But government should help, structuring the marketplace by collecting data on career outcomes—ideally, measured school by school and program by program.

Limited government, less regulation. Government can also help by getting out of the way. Little does more to dampen enthusiasm for apprenticeship in the construction industry than union-inspired regulations and OSHA-driven liability to lawsuits. There need to be standards, of course, for labor rights and workplace safety. But it's no accident that some of the most dynamic business CTE programs have no ties to state or federal government. The most effective thing the government can do: measure the outcomes of career and technical education and help set or endorse standards—but avoid interfering in how training is delivered.

For employers as well as educators, the biggest obstacle to CTE training is the stigma that still comes with it in the eyes of most Americans. Parents would rather send their kids to college. Employers would rather hire workers who have graduated from college. Taxpayers would rather pay for college. Most students would still rather attend college. As long as voc ed is a second choice, programs are unlikely to be as good as they need to be to train the workforce that the nation needs to remain competitive in the future.

The antidote for the stigma? There is only one: success—programs that help employers meet workforce needs and give young people a path to highly skilled, well-paying jobs. This can be a Catch-22: it can be hard to create good programs in the face of the stigma—and hard to overcome the stigma except with effective programs. But ultimately, it's the only way to break through. Employers need to step up and launch CTE training. They need to measure their programs and improve them—and they need to hire from the ranks of the young people they train.

The good news: this is starting to happen, driven by necessity, in a broad range of U.S. industries. Now it's time to take the next steps.

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