



Career Pathways

A Route to Upward Mobility

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Americans historically have had a hard time coming to grips with the realities of class. Our great-grandparents and grandparents came here to escape a world in which their opportunities for liberty and economic mobility were almost entirely constrained by the circumstances of their birth. The enduring belief of each successive generation of Americans has been that demography need not be destiny. In contrast to the Old World, we see our society as one in which no child's future need be limited by the circumstances of his or her birth. From Ben Franklin to Barack Obama, every generation of Americans has been able to point to inspiring examples of people who have risen from modest origins to the very pinnacle of success in one or another sphere of American life. We tell ourselves that America is the only country in which such extraordinary life stories could happen—for unlike the European countries our forefathers fled, we have no rigid class system limiting the ability of ambitious and hardworking young people to realize their potential.

Central to this cultural narrative is our belief in education as the principal engine of economic and social mobility. One of the great public policy success stories in the past century was our decision to greatly expand access to higher education in the period following World War II. We achieved this both through massive investments by states such as California and New York in building world class public universities and comprehensive higher education systems, and through the federal government's investment in providing student financial aid, most notably with the GI bill. Again, we enjoyed noting the contrast with Old World countries, where higher education continued to be seen primarily as the province of the wealthy.

Where in this narrative does vocational education fit? In a world in which most jobs required no more than a high school education and only a relative handful of young Americans went on to college, education that prepared people to work in the traditional trades and crafts was a perfectly respectable option. Not only was there little social stigma attached to vocational education, in mid-twentieth-century America this was actually a mainstream path to help high school students make their way into the labor market. But with the gradual decline of manufacturing and the rapid expansion of the service sector in the second half of the twentieth century, college became the preferred route to good jobs that paid a family-supporting wage. Consequently, not only did vocational education lose market share in the economy of high schools, but too often, vocational programs also became “dumping grounds”—places to send students deemed unfit for rigorous academic work. While there have always been examples of highly successful vocational programs and schools in urban as well as rural America, there have unfortunately also been notorious examples of vocational schools serving predominantly low-income and minority youth that led only to dead-end jobs.

We began meeting with two Harvard colleagues in 2008 to discuss the possibility of developing a report on education and employment. We were mindful that twenty years earlier, a commission established by the W. T. Grant Foundation published a powerful report entitled *The Forgotten Half: Non-College Youth in America*. The big take-home message from that report was that on virtually all indicators of social and economic well-being, those young people not in college were less well-off than their college-going counterparts. Yet as a society we seemed to have no serious strategy to help these

adolescents make a successful transition into the workforce and, more generally, into adulthood.

By 2008 the phrase “non-college youth” no longer was in use, for over the preceding twenty years high schools had, for the most part, ended the practice of dividing their students into the “college-bound” and the “work-bound.” This is not to suggest that tracking had disappeared—but rather to observe that as the movement to raise academic expectations and standards for all students had grown over this period, so had the notion that the central purpose of high school was to prepare all young people for college. Americans were bombarded with a steady barrage of media stories showing the growing differential in lifetime earnings between those with a college degree and those without, and about the disappearance of manufacturing and the accompanying loss of well-paying jobs that did not require a college degree. Economists kept warning of the “hollowing out” of the U.S. economy, telling us we were heading into a world in which there would only be two kinds of jobs: high-skill, high-wage jobs requiring at least a four-year degree, and low-skill, low-wage jobs for everyone else.

Given these messages, it should be no surprise that by 2008 “college for all” had become the new mantra, accepted by parents and by young people themselves. “College Begins in Kindergarten” was the message on the Education Trust T-shirts, and university banners had become ubiquitous in primary grade classrooms in urban America. In surveys of high school seniors asking about plans after high school, over 90 percent said they were going to college. The following October, over two-thirds of graduates were in fact enrolled in some form of post-secondary education. But when we looked at the college attainment data for young people in their mid-twenties, we found that less than 30 percent had a four-year degree. Ten percent had a two-year degree, and another 10 percent or so had a one-year, post-secondary certificate with value in the labor market. This raised for us the question of whether we still in fact had a “forgotten half,” and whether we had made any progress over these two decades in developing a national strategy to help our young people make a successful transition into an increasingly challenging and demanding labor market. It was this question that led to the development of the report we released in 2011, *Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century*.¹

The Response to the *Pathways* Report

The argument of the *Pathways* report was at one level quite simple. It was organized around three questions: First, if less than one young person in three is successfully completing a four-year college degree by age twenty-five, does it really make sense to organize high schools as if this should be the goal for all students? Second, if respected economists are now telling us that at least 30 percent of the jobs projected over the next decade will be in the “middle skills” category—technician-level jobs requiring some education beyond high school but not necessarily a four-year degree—shouldn’t we start building more pathways from high school to community colleges to prepare students to fill the best of those jobs, especially in high-growth, high-demand fields such as information technology and health care?² And third, if countries like Austria, Germany, the Netherlands, Norway, and Switzerland have built vocational systems that prepare between 40 and 70

percent of young people to enter the workforce by age twenty with skills and credentials valued by employers—and if these countries have healthy economies and much lower youth unemployment rates than the United States—shouldn't we study their vocational policies and practices to see if there are lessons we can adapt to our own setting?³

Over the next year, we had speaking invitations from organizations in over thirty states and five countries to talk about the implications of the report. Generally speaking, people in these meetings bought the argument of the report. Their question was: how do we address the questions and challenges raised in the report?

Our response was: we do not have a detailed set of recommendations in our back pocket, but we would be happy to work with you collaboratively to figure out a strategy customized to your state or region. These conversations led to the creation of the Pathways to Prosperity Network in 2012. The Network is a partnership between Jobs for the Future, Harvard Graduate School of Education, and now ten states. It focuses on helping participating states build career pathways that span grades 9–14 and are designed to help young people attain post-secondary degrees and credentials that can launch them into careers in high-growth, high-demand fields—while keeping open the option of further education.⁴

The Case for Career Pathways

In the three years since the *Pathways* report was released, several developments have given significant impetus to the career pathways movement. On the research side, the Georgetown Center on Education and the Workforce has released several reports providing further evidence that the returns to education are not simply a function of how much you have had, but what skills you have acquired. According to the Center's studies, there are now very significant overlaps between the earnings of those with licenses and one-year, post-secondary certificates and those with two- and four-year degrees. Most striking, nearly one-third of those with two-year degrees are out-earning the average four-year-degree holder.⁵ In Florida, for example, those who graduated in 2009 with a two-year technical degree (AAS) were, within two years, out-earning the average young four-year-degree holder by about \$10,000.⁶ More recent research from the Federal Reserve Board of New York has documented the struggles of young four-year-degree holders more generally, reporting that over 40 percent of them are working in jobs that historically did not require a college degree.⁷ Given the rising costs of college—plus the average debt burden of \$26,000 young graduates are carrying—these numbers are causing many parents to question the assumption that an investment in a four-year degree is a guarantee of economic security for their children.

More relevant to the topic of this paper has been a series of international studies of economic mobility showing that, contrary to our view of ourselves, the United States is no longer the country where those born into poverty have the greatest chance of moving up in the world. As these studies have made their way into the mainstream press (see, for example, the January 4, 2012 front-page *New York Times* story, "Harder for Americans to Rise from the Lower Rungs"), Americans have had to face the fact that such Old World

countries as Denmark, Finland, Germany, and Norway—and our New World neighbor, Canada—all have significantly higher rates of economic mobility than we do. In one study, 42 percent of American men whose fathers were in the bottom fifth of the income distribution remained in the bottom fifth, while in Denmark, Finland, and Norway the numbers were between 25 and 28 percent. Even more difficult for Americans to accept is that even in the United Kingdom, the quintessential class-bound society we love to compare ourselves with, only 30 percent of men with fathers in the bottom quintile remained there.⁸

Except for the United Kingdom, virtually all the European countries that have higher economic mobility rates than we do have much stronger vocational systems than ours, and send a significantly smaller percentage of young people off to four-year colleges or universities. Given the no-longer-assured returns to a four-year degree in the United States—and the evidence from other countries that a high-quality vocational education system designed to serve at least 40 percent of the youth population can be an important contributor to both economic prosperity and mobility—the stage may finally be set for a more serious policy focus on revitalizing career and technical education in the United States.

The Pathways Network and the New, Improved CTE

In the two years since we launched the Pathways Network, a consensus has begun to emerge about the contours of a revitalized career and technical education (CTE) system—one that might begin to reflect some of the lessons from the strongest European systems. This consensus has been reflected in the policies and new funding opportunities created in some of the states we are working in, most notably California, New York, Ohio, and Tennessee, as well as in the Obama Administration’s “Blueprint” for the reauthorization of the Perkins Act, the principal federal program supporting CTE.⁹

The first core principle in the emerging consensus is that we must build career pathways that span secondary and post-secondary education. The response to the “college for all” mantra cannot be to return to an earlier era in which some young people are prepared for college while others are prepared for work. Rather, the new mantra must be that all young people will need some form of post-secondary education or training to be able to thrive in this increasingly demanding economy. Therefore, we must build a set of career-focused pathways leading to post-secondary technical education that sit alongside the strictly academic pathway that leads to a four-year college or university. The strongest European programs enroll students at age sixteen in a three- or four-year, full-time program that combines three or four days a week of learning at the workplace with a day or two of continued academic class work. Those students emerge from their program with at least the equivalent of one year of post-secondary training—if not the equivalent of an associate’s degree. No U.S. high school vocational program provides that degree of intensive training in an occupational area.

The second core principle is that CTE programs need to be much more demand-driven than they currently are. This means two things. First, programs must be designed based on a

Careful analysis of regional labor market trends, and especially focused on those industries and occupations which are not only rapidly growing but require people with a solid foundation of core academic as well as technical skills. In other words, fields with good jobs that pay good wages and have the potential to get young people onto a career ladder that leads to the middle class. And second, employers from the target occupational sectors need to be at the table from the beginning. They not only help ensure that the programs are designed to equip young people with the knowledge and skills required for success in that sector, but also provide internships and other forms of workplace learning for participating students throughout the duration of the program.

A third core principle is that all students need to be provided much greater access to career information, awareness, and exposure beginning at least as early as the middle grades. This puts them and their parents in a position to make informed choices among an array of career pathways at some point in their high school years. We believe *all* students would benefit from a much more systematic exposure to the world of careers while in middle and high school, even those who know they are headed for a four-year university. The fact that so many young university graduates are floundering in the labor market tells us that too many students arrive at college with no career plan, choose majors based solely on interest with no reference to the job market, and then find out only upon graduation that they have few marketable skills.

It is these core principles that have guided the development of the Pathways Network. Our work with states is in large measure helping them design grades 9–14 pathways focused on high-demand occupations; build early and sustained career information, awareness, and exposure programs; and develop strategies to engage employers in much more meaningful ways. In our view, this latter challenge requires the presence of strong intermediary organizations that sit between the employer community and schools and colleges and are staffed to design and manage internships and other forms of workplace learning. In some regions, workforce investment boards or chambers of commerce take on this role, but these regions are the exceptions, not the rule. Without some organization that takes responsibility for managing the logistics of placing and supporting young people in workplaces, small and medium-size employers are unlikely to participate—which means that we are unlikely to get to scale.

While the real work of building career pathways happens at the regional labor market level, some of the major challenges and barriers to success can only be addressed at the state level. By design, career pathways programs cut across the education and workforce systems, and across K–12 and post-secondary education. Each of these systems has its own governance arrangements, funding streams, governmental bureaucracies, and political constituencies. Absent a strong state leadership group committed to addressing regulatory and funding barriers and running political interference, each region is forced to wrestle on its own with such questions as who pays for dual enrollment, or how to address employer concerns about liability for sixteen-year-olds in the workplace.

These principles and strategies can best be seen at work in California, where they undergird the design of the California Career Pathways Trust (CCPT). Launched in 2013

with a \$250 million appropriation, it is arguably the largest investment any state has ever made in a competitive grants program for career-related education. The Trust is administered by the California Department of Education but developed collaboratively with the Community College Chancellor's Office and the Workforce Investment Board. It focuses on building regional consortia that bring together high schools, community colleges, and employer associations to build grades 9–14 career pathways in high-skill, high-growth fields designed not only to enable more young people to successfully transition from high school to community college to work, but also to fuel regional economic growth. In May 2014, the state awarded thirty-nine grants to such consortia. Demand for these competitive grants was so intense that in June, the legislature decided to appropriate an additional \$250 million for a second round this year. On the federal level, in 2014 the Obama administration distributed \$100 million in a grants program called Youth CareerConnect based on similar principles.

Getting from Here to There

It is one thing to articulate a set of principles to guide the revitalization and redesign of CTE in our big, diverse country. It is quite another thing to figure out how to build on the strengths of the current system to move us, over time, to a world in which at least 40 percent of young Americans are enrolled in programs built upon the principles outlined above. The first step is to acknowledge that there is no single program model upon which to build the new system. Within the states in our Pathways Network, and in others we have visited, we have seen highly effective CTE programs in standalone vocational high schools, regional vocational centers, career academies nestled inside larger high schools, and early college high schools operated in partnership with colleges or universities. We are consequently agnostic about form. We advise the states and regions we collaborate with to build on what works.

It would be nice if a “what works” discussion could be grounded in evidence, but this is a field in which the evidentiary base is very weak. The one study that advocates consistently invoke is a random assignment study of career academies published in 2006 by MDRC. The study showed virtually no impact on education outcomes—but a significant impact on earnings over an eight-year period for male participants.¹⁰ Beyond that study, there is little data that would enable anyone to privilege one CTE-related program model over another.

Below are short profiles of five exemplary schools or programs representing five different career education models. Each serves a substantial proportion of low-income students. Most have impressive high school graduation and post-secondary enrollment rates (others are too new). Some represent models that have already been scaled; the others, models that could be.

Model 1: Worcester Technical High School, Worcester, MA (*Standalone urban CTE high school*)

In June 2014, President Obama gave his only high school commencement address of the year at Worcester Technical High School, on the outskirts of Worcester, Massachusetts.

With 181,000 people, Worcester is the second-largest city in New England. Sheila Harrity, the NASSP-winning principal of the school, evinced surprise—but Worcester Tech is one of the state’s highest performers despite being declared a failing school in 2006. While Massachusetts schools are known for high academic achievement, few know that its twenty-six regional vocational high schools and three agricultural schools have waiting lists, strong results on MCAS (the state assessment), and higher high school completion rates than the state average. For over forty years, the schools have followed a unique schedule—the first four months of ninth grade, students circulate among career areas offered. Then, with advising, they pick their area of concentration. From then on, the schedule alternates—a week of academics, a week of “shop.” With higher than state average low-income and special ed populations, 82 percent of this year’s 310 graduates are bound for a two- or four-year college. Along with the full array of vocational programs, the school offers AP courses and dual enrollment for college credit.

A U.S. Department of Education Blue Ribbon School, housed in a \$90 million dollar state-of-the-art building on a 400,000 square foot campus, Worcester Tech represents the best of the full-time vocational high school models. Perhaps most impressive is the work experience students gain at Worcester Tech. Students work in profit-making enterprises, both inside the school and externally. The student-run, 125-seat restaurant serves meals to the public at reasonable prices. Also operating at the school: a L’Oreal Redken salon and day spa, a sixteen-bay automotive service center, a full-service bank with ATM, and a state-approved preschool. With one of the highest-ranked veterinary schools in the country, Tufts at Tech provides subsidized animal care to low-income families in the Worcester region; students participate in treatment of over 250 animals per month. The carpentry, plumbing, and electrical students built the veterinary clinic. The graphic students created the name and designed the logo and brochures, and the painting and design students created the signage.

Model 2: Center for Advanced Research and Technology, Clovis, CA (Regional CTE Center)¹¹

“This is my second year as a student in the Economics and Finance Lab,” writes graduating senior Sam Hodorowski, in her blog on the homepage of CART, the Center for Advanced Research and Technology. “During these two years, I have put together financial portfolios, gone on two internships, created a non-profit and am currently creating a for-profit business. None of these are things I would be able to do, especially not with such skill and precision like I have been able to, if not for CART.” A part-time regional career center located in Clovis, California (near Fresno), CART provides half-day programs for 1,300 eleventh and twelfth graders from fifteen high schools. While CART uses CTE funds and has some programs that are standard in California’s Regional Occupational Programs, nothing is standard about a CART education—starting with the CART facility and the CART approach to learning.

The 75,000-square-foot CART building, designed to replicate a high-performance business atmosphere, is organized around four career clusters: professional sciences, engineering, advanced communications, and global economics. Instead of classrooms, teachers, business

partners, and invited experts work in large open spaces filled with equipment, work stations, and student work—spaces similar to those at a high-tech startup or science lab. Within each cluster are several career-specific laboratories in which students complete industry-based projects and receive academic credit for advanced English, science, math, and technology. Boundaries between disciplines don't exist since students are problem solving and learning as one would in the real world. Students do everything from testing water in the Sierra to making industry-standard films to trying out aviation careers by actually flying planes. Teaching teams include business and science partners, and as bios of teachers indicate, many teachers have extensive professional experience.

There are no grade or test requirements for admission; CART students must make the case for themselves as appropriate CART students. Through learning plans, individualized attention, and collaboration with business partners, teachers, and parents, students design programs of study that qualify them to pursue the post-secondary path of their choice—from entry-level positions to industry certification to university admission. According to a 2009 transcript study using data from the California Partnership for Achieving Student Success (Cal-PASS), researchers found that in the prior seven years, CART students matriculated to post-secondary institutions at a higher rate than a matched sample of similar students from the area's high schools.

Model 3: Wake Early College of Health and Sciences, Raleigh, NC (*STEM-focused early college high school*)¹²

Wake Early College of Health and Sciences and WakeMed, one of Raleigh, North Carolina's major hospitals, is helping lead the way to the kind of work-linked learning that equips students with solid skills for careers and post-secondary education. WakeMed helped to found Wake Early College of Health and Sciences in 2006 and remains a key partner, along with Wake Technical Community College.

When students in the class of 2013 received their high school diplomas, more than half also earned associate's degrees. Several earned certifications as nurse assistants and emergency medical technicians. The school's graduation rate has remained well above 90 percent for its first four classes, and the class of 2013 achieved a 100 percent graduation rate. Every student learns not only in the classroom, but also on Wake Tech's health sciences campus and in WakeMed's main hospital. Students participate in job shadowing, internships, and other activities that put them in direct contact with practicing medical professionals. They get firsthand exposure to health care careers and learn from people in those jobs about the skills—hard and soft—necessary for success. They see STEM in action every day.

Several new STEM early colleges are sponsored by major companies. New York City's P-TECH is sponsored by IBM and partners with the New York City Department of Education and the Early College Initiative at CUNY. Graduates of this six-year program should emerge with AAS degrees in computer systems technology or electromechanical engineering technology. New York State has funded twenty-six P-TECH adaptations in each economic region. SAP, the German business solutions company, is sponsoring several early college programs: one just opened in New York City and another will open in Boston in 2015. New

York City also has schools opening sponsored by an advertising industry organization, Montefiore Hospital, and Con Edison. Paramount Farms, a major agricultural company in California's Central Valley, is sponsoring the development of five early colleges focused on agriculture business management, plant sciences, and agriculture mechanics needed for the Valley's agriculture industry.

Model 4: Southwire 12 for Life, Carrollton, GA (*Employer-sponsored school in a workplace*)¹³

Half of the world's copper rod for electric wires and cables is made with the patented Southwire Continuous Rod (SCR) method of production in rural Carroll County, Georgia. A family-owned company, in the early 2000s, Southwire leaders became worried about filling the human capital pipeline. Only one-third of Carroll County high school students completed school, and even graduates seemed unprepared for jobs. Southwire came up with a radical idea to build a factory that would be staffed by at-risk students. Students would work four-hour shifts and spend four hours in academics. Despite worries that ran from safety to coordinating school schedules, 12 for Life opened in 2007 with sixty-nine students, admitted preferentially because they had poor attendance and academic records, came from stressed and troubled families, and were likely to drop out.

At the start, 12 for Life students took their classes at the high school and then came to work. But in 2013, Southwire built six classrooms, including a science lab and a computer lab, inside the 12 for Life facility. As of 2013, about one-third of students took their academic classes in those classrooms, while the rest attended the county high school.

The Carroll County public school system staffs the facility with teachers and counselors and pays for transportation. Southwire covers all other costs, including wages, facilities, utilities, maintenance, and the salaries of ten Southwire supervisors. Student earn \$8 per hour plus a 50¢-per-hour bonus during weeks of perfect attendance and another 50¢-per-hour bonus during weeks when they hit a production target. Each week, roughly half receive both bonuses and earn \$9 per hour. (A full-time Southwire employee performing similar tasks would earn \$14–15 per hour plus benefits.) Perhaps the most surprising part of this story is how well teenagers can perform: 12 for Life students are, on average, 30–40 percent more productive than adult employees on the same tasks. The students typically work in small teams, with operating lines laid out so that each team sees how others were performing—the competition is a great fuel for productivity. Student workers now generate over \$1.7 million in profits, most of which is invested back into the program.

Not only has Southwire benefited, so have the district and the students. From 2007 to 2013, 12 for Life students graduated at a 78 percent rate, compared to 55 percent among demographically and academically similar Carroll County students. Some 40 percent of 12 for Life graduates went on to post-secondary education. Fifty graduates joined Southwire as regular employees. Southwire has added life skills workshops to the program, helping student learn how to file taxes and open bank accounts. School coordinators also provide optional mentoring, matching students with adults—most from within Southwire. As one

observer noted, students wear their 12 for Life T-shirts like they're coming back from a rock concert.

Model 5: District-Wide Career Academies, Long Beach, CA (*Wall-to-wall career academies*)¹⁴

Arguably the highest quality career-focused high school reform strategy in the country, Linked Learning is an approach now deeply embedded in nine California districts and expanding elsewhere. A decade of support from the James Irvine Foundation, to districts and a multitude of partners, has provided technical assistance, capacity building, research, and resources to build out the Linked Learning approach. Certified Linked Learning pathways are built around four elements: rigorous academics, real-world technical skills, work-based learning, and personalized support. California has passed legislation to expand Linked Learning, and more recently, appropriated \$500,000,000 for the California Career Pathways Trust, an initiative that draws in part on the Linked Learning approach.

Long Beach Unified School District (LBUSD) embraced Linked Learning as a district-wide structure for redesigning all its high schools, with almost all students across the district currently in career-themed pathways. LBUSD high schools are large, some with over four thousand students; prior to Linked Learning they had been organized into smaller learning communities, but not with industry-connected themes. Today, high schools have pathways in Architecture, Construction, and Engineering; Media and Communications; Health Science and Medical Technology; Engineering and Design; Manufacturing and Product Development; and Public Service.

Because LBUSD committed to enabling students to experience the real-world applications of their classroom work, the district had to make substantial changes in the way it did business. Cal State Long Beach established a Linked Learning teacher-training program and in-service workshops to support teachers in providing project-based, integrated academic and career-focused units of study. LBUSD also provided teacher externships in industries that enable teachers to design projects and assignments reflective of the demands of employers. And because of stable and trusted district leadership, and the close proximity of both Long Beach City College and Cal State Long Beach, partnership agreements forged between these institutions mean that LBUSD graduate can matriculate into pathways aligned with their high school's Linked Learning theme.

Marrying Two Models

In our view, the two models that, if combined, would hold the most promise for achieving scale within comprehensive high schools are career academies and early college high schools. Career academies have come a long way since MDRC began its study twenty years ago. There are now several thousand academies operating all over the country, including nearly one thousand in California. The National Academy Foundation, launched thirty years ago by Sanford Weill, then CEO of American Express and later Citigroup, currently sponsors 565 academies across the country. These academies serve about 70,000 students, two-thirds of whom are African American or Latino. NAF academies operate in five career

areas: finance, health care, pre-engineering, information technology, and hospitality and tourism. They have very high self-reported high school graduation and college-going rates. Over half of NAF graduates complete a four-year degree, and 90 percent report that NAF participation helped them in their career choice.¹⁵

Early college high schools (ECHS) are a more recent phenomenon, begun in 2002 by the Bill and Melinda Gates Foundation with grants to several organizations to expand existing schools or start new ones, and a grant to Jobs for the Future to provide technical assistance and coordination to the school developers. Twelve years later there are approximately 80,000 students in 280 early colleges; nearly three-fourths are students of color. The ECHS graduation rate is 90 percent, and the average ECHS student graduates high school with thirty-eight college credits. Roughly 30 percent graduate with an associate's degree or a post-secondary certificate.¹⁶

At its best, the academy model integrates rigorous academics with a sequence of technical courses, augmented with an aligned internship, in a particular career area. However, most academies have weak or nonexistent connections to post-secondary programs in the same field. They don't see building these relationships as part of their mission, for they are in the high school reform business, not the career preparation business. Conversely, early college high schools came into being explicitly to blend high school and college, and they have definitively demonstrated that their acceleration model can help entire cohorts of low-income and minority kids seamlessly navigate the transition to college—and leave high school with a year or more of free college credit. While roughly one-third of early colleges have a STEM focus, there is relatively little focus in the ECHS model on careers, and little explicit effort to align high school and college technical courses into a career pathway for young people. However, when the strengths of these two models are combined, as they are in the WakeMed example profiled above and the growing network of P-TECH schools in New York, Chicago, and Connecticut, students have an opportunity to demonstrate that they are genuinely college- and career-ready. The early college movement has definitively demonstrated that the best predictor of college readiness is the successful completion of college courses, preferably taken on a college campus. We argue by analogy that the best predictor of career readiness is the successful completion of a workplace internship, something that is built into the WakeMed and P-TECH models.

Getting to Scale: The Swiss Experience¹⁷

We have had the opportunity over the last several years to spend time visiting and studying vocational education systems in Australia, Denmark, Germany, the Netherlands, Norway, Singapore, Sweden, and Switzerland. While all of these systems have some admirable features from which the United States could learn, we believe the Swiss system has the most to teach us. For one thing, like the United States, it is a state-based system. Education is the responsibility of the cantons, not the national government—and Swiss cantons, like U.S. states, are highly diverse. That said, there is a federal office that oversees vocational education and provides substantial leadership, quality control, and support.

Perhaps the most important feature of the Swiss Vocational Education and Training (VET) system is that it is genuinely a mainstream system: 70 percent of Swiss youngsters enroll in vocational education programs at age sixteen. These typically last three or four years and combine learning at a workplace with continued academic study. When 70 percent—the largest percentage of any of the systems we visited—of a nation’s young people are in vocational education, it becomes the norm, not the exception, so it is difficult to attach any sense of stigma. Almost by definition the system is serving a broad range of students, and the range of occupations for which VET is the preferred preparation is equally broad. One of the great strengths of the Swiss system is that for those who start out in vocational education, there is not only a clear path leading to post-secondary vocational education—culminating in a network of Universities of Applied Sciences—but there are also crosswalks for those wanting to transfer over to the strictly academic pathway. Those wanting to leave the academic pathway and transfer to the vocational side, however, must first get a year’s work experience, thereby signaling the value the Swiss attach to the value of learning at the workplace.

If there is a single key to the success of the Swiss VET system, it is the deep engagement of employers and the leadership role played by the associations that represent them. Simply put, Swiss corporate leaders believe that their high-skill, high-wage economy can only be sustained by an early and continuing investment in the development of their future workforce. Swiss employer associations take the lead role in developing occupational standards for their industry sector, and work in partnership with educators in developing curriculum aligned with the requirements and expectations of the workplace. They also participate in assessing the performance of students at the end of their apprenticeship in order to ensure that they meet national standards. Most important, they provide paid three- or four-year apprenticeship slots and assume the costs of providing training and coaching for their apprentices. It is hard to overstate just how different this is from the role that employers play in the American CTE system, where the norm for even the most engaged employers is participation on an advisory committee, some opportunities for job shadowing, and perhaps the provision of a few short-term, unpaid internships.

As important as our conversations with employers were the informal conversations we had with students in vocational schools and a variety of work settings: banks, factory floors, a senior citizen residence, and many others. Almost everywhere we saw bright, engaged kids who were clear about what they were learning and why, and who radiated a sense of agency and self-confidence. The adults who surrounded them, especially their workplace supervisors and mentors, were full of praise for what their students had accomplished, and for what the students had contributed to the culture and climate of the workplace through their energy and openness to new learning.

We began our visits to Switzerland and other “dual system” countries with some skepticism about sixteen- and seventeen-year-olds in the workplace, but we have seen that under the right conditions work can be a powerful contributor to healthy youth development. We now understand what Swiss employers mean when they describe the system as being “win-win” for both the economy and young people. One measure of that success is that the youth unemployment rate in Switzerland is the lowest in Europe, about 3 percent. Another is that

Swiss employers neither require nor receive any direct subsidy from the government for employing apprentices. Careful economic cost-benefit analyses have shown employers that over three years the contributions to bottom-line productivity by apprentices more than offset the investment in wages (approximately \$800 a month, growing to \$1,000 by year three) and associated training costs.

Adapting Lessons from Abroad

Americans are understandably skeptical about what can be learned from a country like Switzerland. It is small, wealthy, and looks relatively homogeneous. In the United States it would be a medium-size state, like Maryland. In reality it is quite diverse, with three different language groups and one-fourth of its population born outside of Switzerland. Its immigrants, however, are mostly internal to Europe, and it has nothing like our level of child poverty. Furthermore, it has had an apprenticeship system for many generations, and that system is deeply embedded in the country's social fabric and political culture. It would be foolhardy to pretend that one could simply pick up that system and transplant it in the United States.

That said, in our view it would be equally foolish to behave as if there is nothing we can learn from the Swiss VET system, and that the principles that undergird that system and the policies and practices that drive it cannot possibly be adapted in some form in our setting. As is probably apparent from some of our earlier references to the Pathways Network, the Network is at least in part organized around a set of ideas based on what we have seen in Switzerland and other high-performing vocational systems.

Of the many challenges we face in moving our secondary education system more in the direction of the Swiss system, let us focus on just two. The first concerns the quality of prior academic preparation young people would need in order to take advantage of the kind of rigorous career pathways we are advocating. One big advantage of the Swiss (and other European) education systems is that compulsory schooling ends at the end of "lower" secondary education, typically ninth grade. This seems to have two big effects. It concentrates the attention of the system on ensuring that, to the extent possible, all young people get the academic underpinnings they will need during those years to make a successful transition to whatever comes next. And it says to young people who are bored with school that if they can hang on through ninth grade, there is an attractive option that will enable them to complete their high school education in a much more applied-learning mode, spending most of their time learning and working alongside adults in a workplace rather than only with age mates in classrooms. Switzerland's impressive math performance on the PISA assessments, taken when students are in ninth grade, suggests that these incentives work for both the system and the students.¹⁸

In the United States, the best evidence that offering young people the opportunity to get started on college and career early can strengthen the development of core academic skills comes from the early college high school data cited above. This suggests that if students in the middle grades can see a way to accelerate their path through school and into the workplace, it might motivate them to get the academic foundation they need. The challenge

for the system is to deliver on the promise of the Common Core: to provide all kids at least through tenth grade with a solid floor of literacy, quantitative reasoning, and critical thinking skills. The jury is very much out on whether we have the capacity or the will to do this, but one constituency whose voice will be crucial is employers—which brings us to the second big challenge.

American employers and their associations typically do not play a significant role in education and workforce preparation. While they may participate on advisory committees for vocational schools and centers, they play virtually no role in the comprehensive high schools most students attend. However, many employers do have close working relationships with community colleges, often turning to them for customized training to upgrade the skills of incumbent workers. Rather than asking employers to get entangled with high schools, an alternative strategy is to bring employers and community college leaders together—first to set the standards and specifications for the career pathways, and then to map backward to connect the high schools. We know it will not be possible to build a Swiss style “dual system” in the United States, in which high school students are spending three days a week at a workplace. But we do think it is possible to build a system in which over a three- or four-year period, spanning grades 11–13 or 14 and including summers, students get six months of workplace learning built into a career pathway program.

Career Pathways and Economic Mobility

Given the historically low status of vocational education in the United States—and especially the understandable skepticism of African American and Latino parents that anything labeled “vocational” can be a route into the middle class for their children—it is no wonder that advocates for the new CTE (ourselves included) emphasize that career pathways represent an alternative route *into* post-secondary education, not an alternative *to* college. It should also be no surprise that for messaging reasons we lead with programs with a strong STEM foundation in fields such as health care and information technology, rather than the more traditional trades such as carpentry, automotive repair, and plumbing. The reality, of course, is that these jobs today also typically require a strong mathematical foundation and some computing skills, and pay a family-supporting wage.

If the new, improved CTE is to gain sufficient political momentum to become a significant engine of economic mobility, several things would have to happen. First, well-structured partnerships need to be built among high schools, post-secondary institutions, and employers. This would give parents and students visible evidence that career pathways that begin in high school can lead seamlessly into post-secondary education and employment. Second, exposure to myriad careers—and the education and training requirements for entering those careers—must begin early and become a much more systematic component of the middle school and high school experience.

The third issue that must be addressed is the question of which students participate in CTE. The challenge is embodied in the saying, “Vocational education is a wonderful thing—for other people’s children.” If CTE continues to be seen primarily for at-risk youth and for students who can’t be expected to do serious academic work, it will never gain the

resources and political support it needs to be fully effective. Most important, it will never gain the serious engagement of the employer community. Employers may be persuaded to participate out of a sense of corporate social responsibility, but unless and until CTE becomes a mainstream system, serving a very broad range of young people, employers will not see investing in CTE as a way of building their own future workforce.

Many years ago, sociologist William Julius Wilson argued that social programs directly focused on the poor were less likely to gain political traction than programs that were targeted especially to help the poor but were embedded within a more universal design (e.g., Medicare and Social Security.)¹⁹ The career pathways movement needs to be designed and marketed as a strategy to improve the economic prospects of a broad range of students, not just the poor. Given the statistics cited earlier about the underemployment of young college and university graduates, the rising student debt burden, and the growing evidence about the returns to two-year technical degrees, middle class parents are beginning to reexamine the notion that the only successful outcome of a high school education is enrollment in a four-year college.

As two educators with advanced degrees in the liberal arts, we certainly don't want to argue that the only purpose of post-secondary education is to prepare people for the workforce—more education is always a good thing. But take the evidence from *Academically Adrift*, a 2010 sociological study of the learning gains of a sample of students in a broad cross-section of four-year institutions: it appears that far too many students simply drift into college with no clear plan, get caught up in the pressures of peer culture and social life, and leave college with little evidence of growth in such foundational skills as analytic reasoning and writing, let alone with preparation for a career.²⁰ Only six students in ten who start a four-year college graduate within six years, and new evidence tells us that those with “some college” are no better off in the labor market than those with only a high school diploma.

Yes, a four-year degree, especially for low-income youth and students of color, absolutely pays off—and given the abysmally low attainment rates among those groups we should be focused on increasing their access, retention, and completion at four-year institutions. But two-year degrees and one-year post-secondary certificates also pay off. And we must strengthen and expand the pathways leading to these options in order to launch more young people into careers that can, in turn, propel them into the middle class.

¹ Ronald Ferguson, Robert Schwartz, and William Symonds, *Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century* (Cambridge, MA: Harvard University Graduate School of Education, February 2011), http://dash.harvard.edu/bitstream/handle/1/4740480/Pathways_to_Prosperty_Feb2011-1.pdf?sequence=1.

² Anthony P. Carnevale, Nicole Smith, and Jeff Strohl, *Recovery: Job Growth and Education Requirements Through 2020* (Washington, D.C.: Georgetown University Center on Education and the Workforce, 2013).

³ Organization for Economic Cooperation and Development, *Learning for Jobs* (Paris: OECD).

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- ⁴ For a progress report on the first two years of the Pathways Network, see *The Pathways to Prosperity Network: A State Progress Report, 2012–2014* (Boston, MA: Jobs for the Future, June 2014), <http://www.jff.org/publications/pathways-prosperity-network-state-progress-report-2012-2014>.
- ⁵ Anthony P. Carnevale, Stephen J. Rose, and Andrew R. Hanson, *Certificates: Gateway to Gainful Employment and College Degrees* (Washington, D.C.: Georgetown Center on Education and the Workforce, 2012), 4.
- ⁶ Grace Chen, “Community Colleges vs. State Schools: Which One Results in Higher Salaries?” *Community College Review*, <http://www.communitycollegereview.com/articles/315>.
- ⁷ Jaison R. Abel, Richard Deitz, and Yaquin Su, “Are Recent College Graduates Finding Good Jobs,” *Current Issues in Economics and Finance*, Federal Reserve Bank of New York 20, no. 1, 2014.
- ⁸ For a review of these studies, see Julian B. Isaacs, “International Comparisons of Economic Mobility,” in Ron Haskins, Julia B. Isaacs, and Isabel V. Sawhill, *Getting Ahead or Losing Ground: Economic Mobility in America* (Washington, D.C.: Brookings Institution, 2008).
- ⁹ See *Investing in America’s Future: A Blueprint for Transforming Career and Technical Education* (Washington, D.C.: U.S. Department of Education, April 2012), <https://www2.ed.gov/about/offices/list/ovae/pi/cte/transforming-career-technical-education.pdf>.
- ¹⁰ James J. Kemple, *Career Academies: Long-Term Impacts on Labor Market Outcomes, Educational Attainment, and Transitions to Adulthood* (New York, NY: MDRC, June 2008), <http://www.mdrc.org/publication/career-academies-long-term-impacts-work-education-and-transitions-adulthood>.
- ¹¹ Adapted from “What is CART?” (see <http://cart.org/what-is-cart/>) and *A Model for Success: CART’s Linked Learning Program Increases College Enrollment* (Clovis, CA: Center for Advanced Research and Technology), January 2011, <http://irvine.org/images/stories/pdf/grantmaking/cart%20findings%20report%20final.pdf>.
- ¹² Adapted from Wake Early College, “Work-Linked Learning Creates Opportunities,” <http://ncnewschools.org/testimonials/profiles/work-linked-learning-creates-opportunities/>. Also see school website: <http://healthscienceec.wcpss.net>.
- ¹³ Adapted from Jan Rivkin and Ryan Lee, “Southwire and 12 for Life: Scaling Up?” Harvard Business School Case 714-434, October 2013, <http://www.hbs.edu/faculty/Pages/item.aspx?num=45785>.
- ¹⁴ Adapted from Joel Knudson, “Meeting 17 Summary — College and Career Readiness for All: Linked Learning in Long Beach” (Long Beach, CA: The California Collaborative On District Reform, November 7-8, 2011), http://www.cacollaborative.org/sites/default/files/CCDR_Meeting_17_Summary_Final.pdf.
- ¹⁵ National Academy Foundation, “Statistics and Research, 2013–14” (New York, NY: National Academy Foundation), www.naf.org/statistics-and-research.
- ¹⁶ Michael Webb and Carol Gerwin, *Early College Expansion: Propelling Students to Success at a School Near You* (Boston: Jobs for the Future, 2014), 12, http://www.jff.org/sites/default/files/publications/materials/Early-College-Expansion-ExSumm_031414.pdf.
- ¹⁷ Nancy Hoffman and Robert Schwartz, “The Swiss Vocational Education System” (Washington, D.C.: National Center on Education and the Economy, 2014).
- ¹⁸ In 2012 Switzerland outperformed every European country except neighboring Lichtenstein on the PISA mathematics assessment.
- ¹⁹ William Julius Wilson, *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy* (Chicago: University of Chicago Press, 1987).
- ²⁰ Richard Arum and Josipa Roska, *Academically Adrift: Limited Learning on College Campuses* (Chicago: University of Chicago Press, 2011).