NGLC MyWays

5 Roadblocks to Bootstrapping a Career

Report 2 of the MyWays Student Success Series

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Dave Lash and Grace Belfiore
for Next Generation Learning Challenges

The MyWays™ Student Success Series

All reports in the series are available for download at myways.nextgenlearning.org/report.

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Summarizes specific real-world realities and conditions confronting today's young people.

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About this report

Report 2, *5 Roadblocks to Bootstrapping a Career*, probes five specific challenges facing young people as employers pull back on developing human talent — investing instead in technology, automation, and an on-demand workforce. Young job hunters must also contend with increasingly complex and impersonal online hiring systems that seek "perfect" candidates with pre-existing experience and competencies.

Report 2 is the second of five reports in Part A of the MyWays Student Success Series. **Part A, "Adolescence in an Age of Accelerations,"** analyzes the real-world changes and conditions that are most acutely impacting young people and outlines key developmental tasks of the adolescent years.

The ***MyWays Student Success Series*** examines the through-line of four essential questions for next generation learning and provides research and practice-based support to help school designers and educators to answer these questions. The series consists of 12 reports organized into three parts, plus a Visual Summary and Introduction and Overview.

The **primary researchers and authors** of the *MyWays Student Success Series* are Dave Lash, Principal at Dave Lash & Company, and Grace Belfiore, D.Phil., Principal Consultant at Belfiore Education Consulting.

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NEXT GENERATION LEARNING CHALLENGES

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REPORT 2

5 Roadblocks to Bootstrapping a Career

Why is the current labor market so difficult for young people? Our research revealed 5 Roadblocks that new entrants must overcome — roadblocks reflecting the more complex human ecosystem that the labor market has become. These roadblocks require both new, nontraditional competencies, such as those described in the MyWays Student Success Framework, and new, nontraditional systems for developing those competencies.

The 5 Roadblocks are:

1. A chronically weak labor market
2. The accelerating pace of automation
3. The hard shift to an on-demand workforce
4. A bias for hiring experience over potential
5. The job-hunting labyrinth

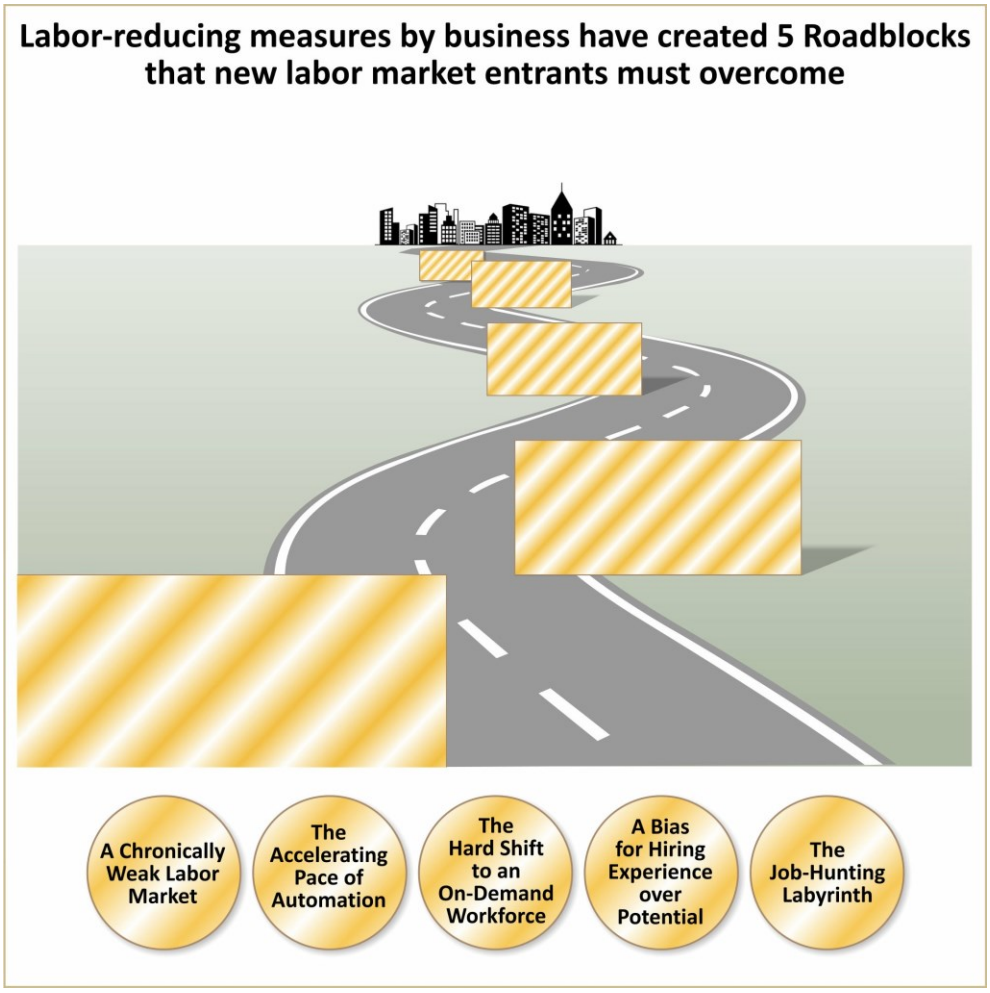
Key reading

Why Good People Can't Get Jobs
by Peter Cappelli

The Class of 2015:
Despite an Improving Economy,
Young Grads Still Face an Uphill Climb
from the Economic Policy Institute

"A World Without Work," by Derek Thompson, *The Atlantic*, July/Aug 2015

The Second Machine Age
by Erik Brynjolfsson and Andrew McAfee



R1 *ROADBLOCK 1.* A chronically weak labor market

> *"Young workers always experience disproportionate increases in unemployment during periods of labor market weakness — and the Great Recession and its aftermath is the longest, most severe period of economic weakness in more than seven decades."*
>
> —Economic Policy Institute, *"The Class of 2015"* [1]

Ten million Americans under the age of 25 are unable to find full-time work, a number considerably greater than the 8.5 million total workers who lost their jobs during the Great Recession.[2] That is a shocking statistic. And, while there are four million more jobs today than before the recession started in December 2007, each year the economy adds only half the jobs needed to offset labor population growth and the jobs lost to productivity gains.[3]

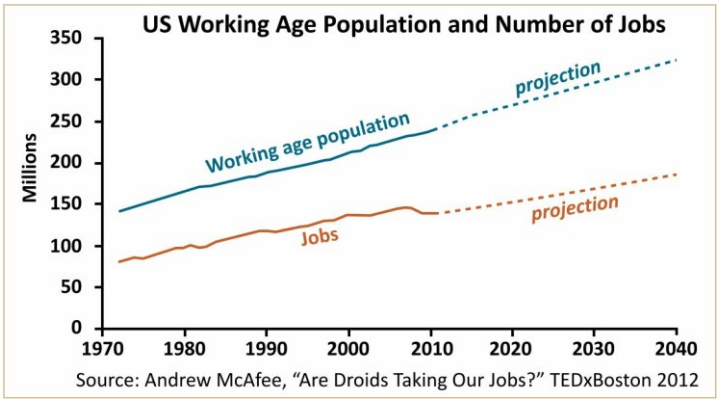
This imbalance sets off a chain of negatives: underemployment, stagnant or falling wages and benefits, poor working conditions, and prime-age Americans — those 25–54 years old — who are neither working nor looking for work.

Sadly, anemic job creation is not a new or temporary trend, and it has been getting worse for five decades, as Martin Ford explains in *Rise of the Robots*:

> Over the past half-century, the US economy has become progressively less effective at creating new jobs. Only the 1990s managed to — just barely — keep up with the previous decade's job growth, and that was largely due to the technology boom that occurred in the second half of the decade. The recession that began in December 2007 and the ensuing financial crisis were a total disaster for job creation in the 2000s; the decade ended with virtually the same number of jobs that had existed in December 1999. Even before the Great Recession hit, however, the new century's first decade was already on track to produce by far the worst percentage growth and employment since World War II.[4]

As a result, following the recessions of 1990, 2001, and 2008, the nation experienced long "jobless recoveries" that required 31, 46, and 76 months, respectively, to regain prerecession job levels.[5] Consider for a moment the difficulties students face when attempting to enter the labor market during one of these recessions or prolonged, multi-year "recoveries."

Slow job creation creates a growing divergence between the working-age population and jobs. Andrew McAfee at MIT's Center for Digital Business projects, in this graph, even greater divergence over the coming decades and warns that the jobs projection could be much worse.[6] One of the truest barometers of employment equilibrium is the share of prime-age workers



who are unemployed or out of the workforce altogether. Because women's participation in the workforce has been variable, growing substantially over the past 50 years, researchers typically use male employment data to study long-term labor trends. In the 1950s and 1960s, about 9% of men ages 25–64 were unemployed or out of the workforce; today that figure has doubled: nearly one in five prime-age men is without work.[7] **Lest one assume that this trend is primarily a product of the Great Recession, the share of inactive men has increased as much in the recovery as during the recession itself.**[8]

Globalization, technological innovation, and Wall Street's relentless push for profits have driven corporate profits to their highest share of national income in more than half a century, while labor's share has sunk to its lowest level since 1929. Lawrence Katz, economist and co-author of *The Race between Education and Technology*, remarks: "for as long as we've had a modern economy, this is the worst we've seen it."[9]

The result is an economy that has become inhospitable to students attempting to enter the workforce. Corporations' relentless drive to reduce costs — including labor costs — has fueled organizational flattening, outsourcing, offshoring, automation, and myriad other labor-reducing initiatives that are part of what economist Joseph Schumpeter calls the natural productivity-seeking cycle of "creative destruction" in the economy. Increasingly, layoffs during recessions are permanent as corporations shift to temporary and contract workers; further, in the recent recession, many middle-skill jobs were automated or replaced by lower-skill, lower-wage jobs.[10] MIT labor economist David Autor has called this hollowing out of middle-wage jobs, *labor polarization*.

Historically, job losses caused by creative destruction within established firms have been offset by the golden goose of the American economy: the millions of jobs created each year by new businesses. Unfortunately, new business creation in each of the 50 states has been declining since the 1980s. Furthermore, the average number of people each new business employs has fallen from eight in the 1990s to fewer than six.[11] (For more on jobs and the economy, see *Chart Book: The Legacy of the Great Recession*.)

A report by the McKinsey & Company consulting firm emphasizes the hardship that long-term job shortage inflicts on workers:

> Weak job creation and jobless recoveries have negative effects on individual workers, their families, communities, the overall quality of the labor force—and, inevitably, on society. An extended period of unemployment measurably lowers health outcomes and lifetime earnings; a worker who returns to work after long-term unemployment will earn 20 percent less over the next 15 to 20 years than a worker who was continuously employed . . . . [Furthermore,] workers who shuttle from one part-time job to another as they piece together a full-time paycheck will be outside the traditional employer-based benefits system.[12]

In chronically weak labor markets, employers have enormous leverage that puts young Americans behind the eight ball. A surplus of experienced adult workers forces many young Americans to the end of a long, long hiring line. Those with college degrees frequently bump those without degrees, even for low-paying jobs that do not require a degree. Temporary and part-time jobs are increasingly the norm. The very process of hiring puts young people at a disadvantage. Each of these roadblocks is examined in the following pages.

How the weak labor market roadblock impacts students

This first roadblock — a chronically weak labor market — means that students face competition from the outset to muscle their way into the workplace. They need to be informed constructively about the new work environment and their options and possibilities. They need a map of promising job sectors and a survival plan for working when a full-time job isn't available. They need early work experience and on-ramps that employers will value.

Students also need to understand how technology and automation enable revolutionary changes in the way workers work and organizations organize. As McKinsey emphasizes, technology makes it possible for companies to design work and manage labor in whole new ways.[13] As we now describe, automation is accelerating; many economists and technologists believe that understanding automation and how to work with smart machines in a complementary way will be increasingly important to holding a job.

ROADBLOCK 2. The accelerating pace of automation

"The 'message' of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs."[14]

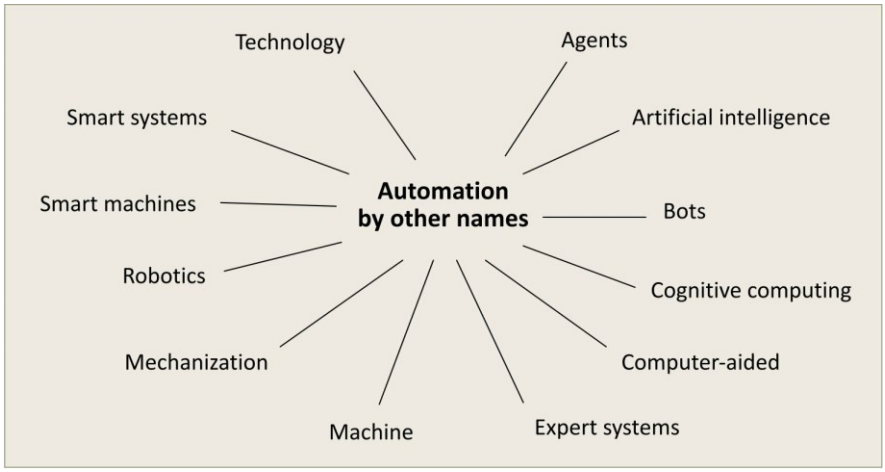
—Marshall McLuhan, *Understanding Media*

In 1998, US workers in the private sector worked 194 billion hours. Over the following 15 years, inflation-adjusted business output increased by 43% while the hours required to produce this much-larger output remained unchanged…194 billion hours.[15] **Fifteen years of economic growth with no increase in labor!** Few Americans comprehend the "modern day Cambrian explosion"[16] of automation that is underway — or the impact it will have on the economy, the workforce, and the lives of today's students. MIT's Erik Brynjolfsson and Andrew McAfee sum up the stakes for current and future workers:

> Technological progress is going to leave behind some people, perhaps even a lot of people, as it races ahead… [T]here's never been a better time to be a worker with special skills or the right education, because these people can use technology to create and capture value. However, there's never been a worse time to be a worker with only "ordinary" skills and abilities to offer, because computers, robots, and other digital technologies are acquiring these skills and abilities at an extraordinary rate.[17]

It is the pace of this change that is most troubling, and evidence shows that these job disruptions hit young workers — who have yet to acquire mature skills and experience — particularly hard.[18]

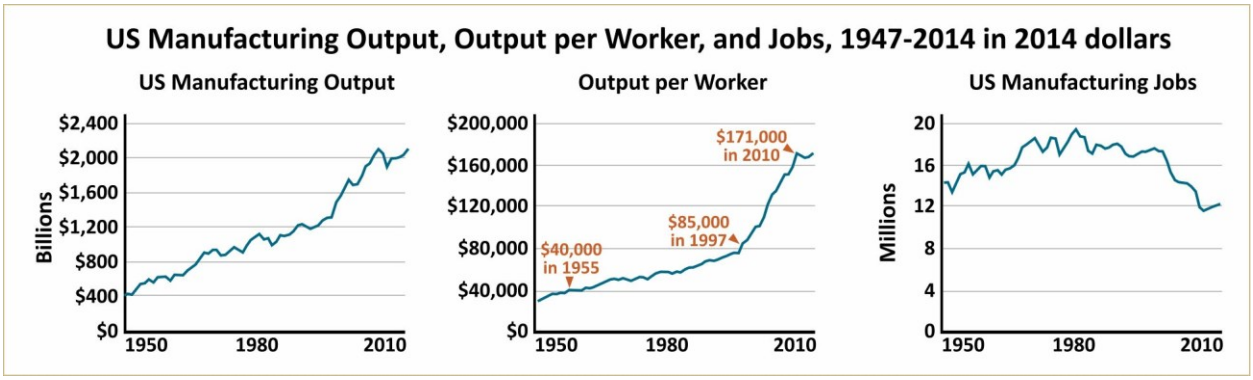
In an attempt to understand how automation and artificial intelligence (see graphic below) might shape the labor market in the coming decade and beyond, and which student competencies might be needed to adapt to rising automation, we studied the work of labor economists, technologists, and business historians. Three books provide excellent overviews: *The Second Machine Age*, *Humans Need Not Apply*, and *Rise of the Robots*. Our goal in this section is to give next generation educators a primer on some of the key trends and principles that are driving this change. We also include a playlist of videos that demonstrate science fiction novelist William Gibson's famous quote: "The future is already here; it's just not very evenly distributed."[19]



The migration of jobs from agriculture to manufacturing to services to…to…to…?

At the birth of our nation, farms employed 80% of US workers. By 1900, farm mechanization had cut that number in half to 40%, and today it is less than 2% and continues to fall as artificial intelligence and other digital technologies enable new methods for planting, fertilizing, weeding, and harvesting.[20]

As agricultural jobs declined, manufacturing and services took up much of the slack. By the 1950s, one-third of the workforce was employed in manufacturing compared to just one-tenth today. (Services, discussed below, comprised 42% in the mid-1950s.) Over the past 60 years, US manufacturing output, and output per worker, have both risen over 400% (see left and middle graphs below). Manufacturing jobs, however, have shrunk 37% from the peak in 1979 (see right graph). Over those 60 years, and



Source: AEIdeas Public Policy Blog, *"Today Is Manufacturing Day"*

especially in the past 20 years, automation, offshoring, and employee training have made manufacturing far more efficient, with the result that fewer US workers are employed in manufacturing today than in 1950![21] Erik Brynjolfsson believes productivity is becoming decoupled from jobs in this "second machine age" as enormously powerful computing merges with increasingly sophisticated "mechanical muscles."[22] (Lest one think this is solely a US phenomenon, manufacturing employment is falling worldwide, even in China and other low-cost labor economies.)

With the shrinking of agricultural and manufacturing employment, services today account for nearly 70% of US jobs, while government employment accounts for another 20%. The good news is that services is a highly diversified sector spanning retail, transportation, technology, construction, health care, education, and business services. That said, automation is accelerating in virtually every subsector of the services industry. In the past, automation has been offset by expanded employment in other parts of the economy; however, that is not the current trend. Further, the impact is not only on repetitious low-skill and middle-skill jobs; high-skill occupations — including law, radiology, and IT — are also being affected. This time, there is not a new labor-intensive sector dawning. Although some labor economists like James Bessen predict that, as in the past, new employment opportunities will be created,[23] it appears that those economists, technologists, and business analysts closest to the fields of automation, robotics, and artificial intelligence are the most alarmed by the potential scale of job disruption that lies ahead.

Here are some indicators of the automation-driven change that is underway:

- Fifty years ago, AT&T was the nation's most valuable company, worth $267 billion in today's dollars and employing more than 750,000 people. Today's comparable giant, Google (Alphabet), is valued at $650 billion but has only 55,000 employees.[24]

- Today's largest bricks-and-mortar retailer, Walmart, employs about five people for every $1 million in sales. By contrast, Amazon, the largest online retailer, employs just over one employee for the same $1 million in sales. In other words, as Jerry Kaplan points out in *Humans Need Not Apply*, "for every $1 million in sales that shift from Walmart to Amazon, four jobs are potentially lost."[25]

- In its heyday just 10 years ago, the video renter Blockbuster required seven employees per store. Today, Redbox employs seven employees to service every 200 self-service video kiosks. Taking self-service to another level, Netflix serves 74 million subscribers in more than 40 countries with its streaming and DVD-by-mail, employing just 2,189 people in 2014.[26]

- The self-service technologies that enabled the Blockbuster-Redbox-Netflix shifts and labor efficiencies are now ubiquitous across the consumer world in streaming music services, ATMs, online banking, self-ticketing websites, automated highway tolls — even your state's motor vehicle registry. Where there once were 30 human cashiers per supermarket, today there might be one human supervising 30 cashier robots.[27] Self-service tax software such as TurboTax has resulted in the loss of 17% of tax preparer jobs[28] — losses that may accelerate with IBM Watson entering the field in 2017.

- Office technologies, including email and cell phones, have resulted in the loss of 2.5 million administrative support jobs since 2000.[29] IT functions in organizations are increasingly automated and based off-site in the cloud; Facebook and other cloud-based firms, for example, use smart software applications to manage and repair tens of thousands of servers autonomously. In describing the efficiencies of cloud-based IT, Martin Ford in *Rise of the Robots* uses the example of Good Data, a small San Francisco analytics company. Good Data uses Amazon's cloud services to perform tasks for approximately 6,000 clients — tasks were previously done in-house by about five workers per client, for a total of about 30,000 workers. Good Data does the same work with 180 employees.[30]

Many of these examples involve the automation of routine tasks. Increasingly, however, as automation and artificial intelligence become more powerful and sophisticated, any predictable work done by humans is a potential labor-saving target. For example, much of the work traditionally done by junior lawyers and paralegals is now performed by incredibly smart e-discovery software that can analyze millions of documents in a court case. Software bots are increasingly interpreting medical imaging, writing technical articles from raw data, and grading student essays. And, with computing speed and capacity continuing to climb exponentially per Moore's Law, the power of these systems is accelerating.

Because the automation roadblock is so potentially significant for students, we believe every next generation educator should educate themselves on these trends so that they, in turn, can educate their students. To help this process, we developed a playlist of automation-related videos that vividly illustrate where these systems are today and where the labor market is headed. Explore with us Amazon's automated warehouses and delivery drones, the automated pharmacies and autonomous vehicles, and the smartest machine ever built — IBM Watson — which is currently employed by more than 500 businesses and is coming soon to your smartphone. Through these videos, you will hear leading voices discussing the new world of work that today's students will encounter.

A MyWays video playlist about automation and the future of work

Introductory videos

PBS NewsHour: Do labor-saving robots spell doom for American workers?
Interview with Jerry Kaplan, technologist, entrepreneur, and author of *Humans Need Not Apply*. Examples of emerging automation, productivity gains, and labor losses.

60 Minutes: Are robots hurting job growth?
Self-service technologies. Heavily automated warehouses. Hospital "tugs." Automated pharmacies. Technological unemployment discussed with Erik Brynjolfsson and Andrew McAfee, authors of *The Second Machine Age.*

CGP Grey: Humans need not apply
The long arc of labor-saving technology and the current transition from narrow, specialized robots to general purpose mechanical muscles and minds. Business incentives to automate. Self-programming software bots. Professional bots. IBM Watson doctor bot. The shape of things to come.

Jobs in an automated economy

TED talk by economist Andrew McAfee: Are droids taking our jobs?
Jobless recoveries. Frontiers of new mechanical skills. Autonomous vehicles. IBM Watson. A future economy that doesn't need many human workers. Infinitely multiplying our mental power. Optimistic vision of the future.

TED talk by Erik Brynjolfsson: The key to growth? Race with the machines
Productivity is at an all-time high, but has become decoupled from jobs. The new machine age is digital, exponential, and combinatorial. Machine learning. Learning to race with the machine.

Nick Hanauer: Rich people don't create jobs
Wealthy Seattle entrepreneur Nick Hanauer presents the argument that businesses create jobs as a last resort when demand is high, and, therefore, it is middle class consumers who are the real job creators.

TED talk by Andrew McAfee: What will future jobs look like?
Why is this time different? Unprecedented machine skills. Operating in the real world. General purpose applications. The abundance resulting from productivity. The thorny challenges: underpinning middle class consumer demand and the disparate prospects of two types of workers.

Shorter videos of emerging automation

Meet Amazon's busiest employee – the Kiva robot (2:26)
Amazon reveals new delivery drone prototype (1:46)
Caterpillar's autonomous trucks (1:47)
Robots speed up lettuce harvest process (2:27)
Super high-density olive harvester (3:09)
Smart agricultural robots (3:04)
Inside the robotic pharmacy (2:31)

Understanding cognitive computing — IBM Watson

What will you do with Watson? (2:33)
Watson may help beat cancer (3:37)
IBM's Watson brings health care technology to the cloud (4:32)
NOVA: IBM Watson: Smartest machine ever built (52:14)
IBM Watson: How it works (7:52)

How the automation roadblock impacts students

Remarking on the ever-accelerating advances in automation, especially in machine learning and artificial intelligence, Brynjolfsson and McAfee warn:

> It's becoming harder and harder to have confidence that any given task will be indefinitely resistant to automation. That means people will need to be more adaptable and flexible in their career aspirations, ready to move on from areas that become subject to automation, and seize new opportunities where machines complement and augment human capabilities.[31]

While automation will help drive economic growth and open the way to new industries and occupations, Kaplan worries that workers are vulnerable to the speed of the coming change:

> Advances in information technology are already cutting industries and jobs at a furious clip, far faster than the labor markets can possibly adapt, and there's much worse to come…. The usual rejoinder to this is that the improved productivity will increase wealth, floating all boats, and that new jobs will emerge to cater to our expanding desires and needs. True enough — in aggregate and on average. But when you dig deeper, this doesn't necessarily mean that we are better off. With labor markets, as with global warming, it's the pace that matters, not the fact. Current workers may have neither the time nor the opportunity to acquire the skills required by these new jobs. And average income doesn't matter if a small cadre of superwealthy oligarchs takes the lion's share while everyone else lives in relative poverty. Increasing wealth may float all yachts while sinking all rowboats.[32]

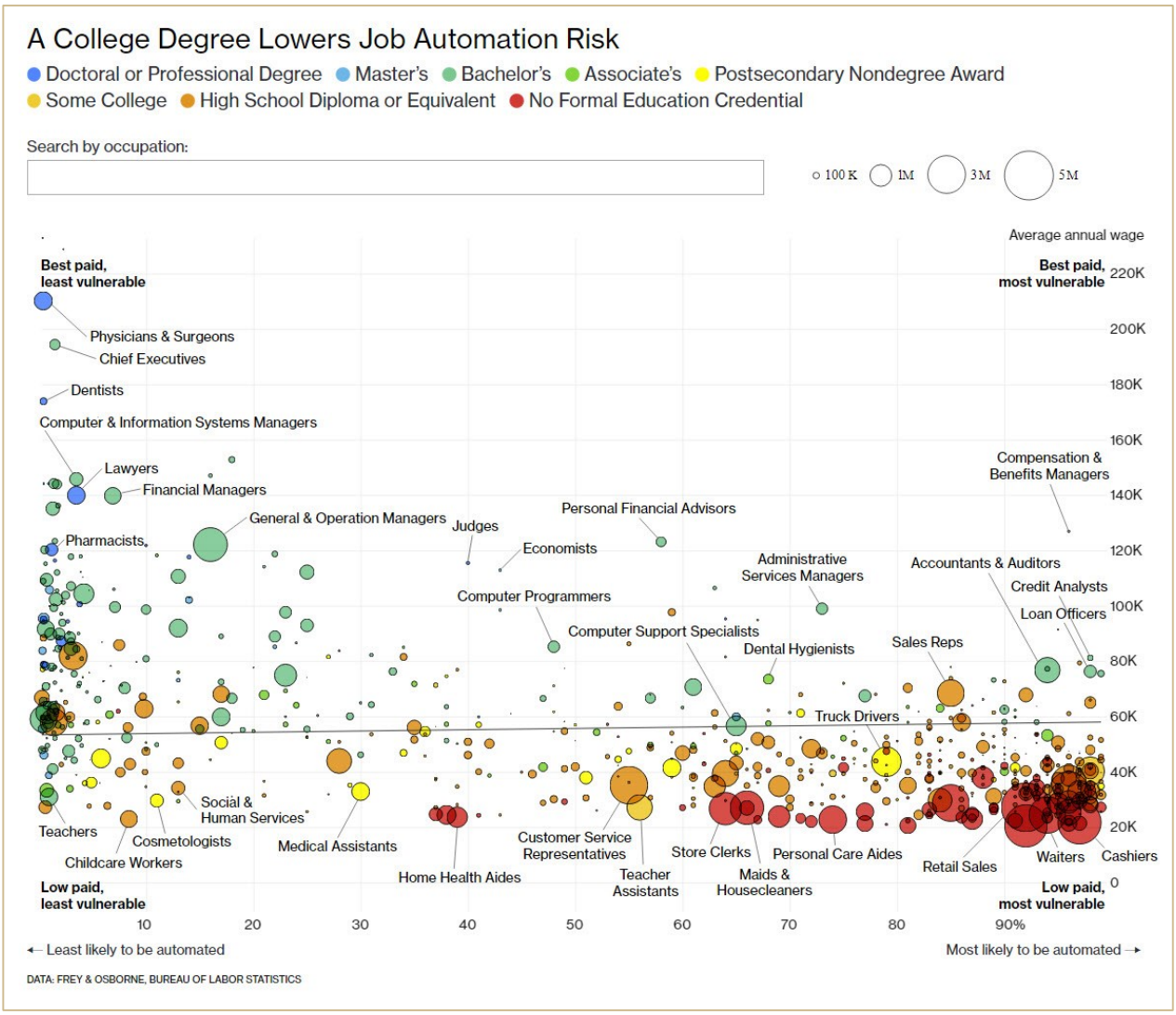
As businesses harness physical robots and software bots to "engineer the labor out of the product," Ford foresees a permanent jobs deficit:

> Information technology has now reached the point where it can be considered a true utility, much like electricity. It seems nearly inconceivable that successful new industries will emerge that do not take full advantage of that powerful new utility, as well as the distributed machine intelligence that accompanies it. As a result, emerging industries will rarely, if ever, be highly labor-intensive. The threat to overall employment is that as creative destruction unfolds, the "destruction" will fall primarily on labor-intensive businesses in traditional areas like retail and food preparation, while the "creation" will generate new businesses and industries that simply don't hire many people. In other words, the economy is likely on a path towards a tipping point where job creation will begin to fall consistently short of what is required to fully employ the workforce.[33]

Ford's thesis is supported by the 15-year slide in the labor participation rate of prime-age workers (those 25–54 years old). The 81% of prime-age workers who are employed or actively looking for work is a 40-year low, and the downward trend continues.[34] (The prime-age labor participation rate is one of the best

gauges of the labor market's health and strength, as the unemployment rate ignores discouraged workers and those only semi-active in job hunting.)

Economists are busy attempting to project not only the overall impact of automation on jobs but also the impact on specific jobs and industries that will be most affected.[35] Bloomberg took some of this data and created an interactive chart of potential job automation risk, with vulnerability running along the x-axis and pay level along the y-axis. Circle size represents the number of jobs at risk; color represents education level (blue for most education, red for least education). Roll your cursor over any circle for information on each job classification. In general, the model concludes that "a college degree lowers job automation risk"; however, note the number of green (postsecondary degrees) jobs across the vulnerability continuum. Furthermore, as noted in Report 1, all jobs — especially middle-skill jobs — are continually being redesigned and transformed in response to technological and economic pressures. Friedman stresses that every job is being *pulled apart* faster (disaggregated)… *pulled out* faster (automated, outsourced, and offshored)… and *pulled down* faster (made obsolete).[36]



For students — both the one-third likely to attain a bachelor's degree and the two-thirds likely to end up with less education — automation creates roadblocks in at least five ways:

1. Students are competing with older, more experienced workers for too few jobs in an increasingly uncertain, turbulent, and competitive labor market.
2. Many middle-skill jobs that are the traditional on-ramps to a working life for under-30s are being automated away while many of the low-skill routine jobs that remain, like today's fast food jobs, offer little training or advancement.
3. Junior-level jobs in law, radiology, computer programming, and many other high-skill fields are being automated as well, increasing the risk of students pursuing an expensive college education and ending up severely underemployed.
4. Picking a training program, college major, or occupation entails much more uncertainty and risk, as the future of that career path may be short-lived and never yield a suitable return on investment.
5. As smart machines take on routine and predictable tasks, young workers lose invaluable "situated learning" opportunities to observe, learn, and grow from more experienced co-workers and supervisors.

On this last point about lost learning opportunities, industrial psychologist Shoshana Zuboff points to social critic Harry Braverman's influential 1974 reinterpretation and critique of automation in which he described the "degradation of work." Braverman observed that a characteristic of automation was the absorption of human skills by technology — and the reduction of on-the-job opportunities for worker skill development and, thus, workers becoming progressively less capable.[37] This pattern of skill erosion has long been true in the construction and manufacturing trades, and it is likely to be true in knowledge work as well.

In addition, as Kaplan observes, the separation of education and work is a further impediment:

> The skills required to do the available jobs are likely to evolve more quickly than workers can adapt without significant changes to how we train our work force. Our current sequential system of education and work — first you go to school, then you get a job — was fine when you could expect to do more or less the same thing for a living throughout your working life. But looking forward, it simply isn't going to work. The nature of the jobs available will shift so rapidly that you may find your skills obsolete just when you thought you were starting to get ahead.[38]

The rising popularity of internships and service learning demonstrates that many students recognize the benefits of immersing themselves in the world of work. However, education needs to go much further to: 1) inform and caution students about technological change in the workplace; 2) develop the broader and richer competencies that will equip young people to compete in an economy increasingly structured around smart machines; and 3) generate personal strategies for creating value. Following are three such

strategies, culled from the literature and supported by employment trends and projections, that all workers can use regardless of their education attainment:

1. **Embrace the machine.** Ride the technology waves by working in a complementary way with smart machines. Leverage computers, bots, robots, and artificial intelligence in a uniquely human way to provide solutions that machines cannot offer. As futurist Kevin Kelly says, "You'll be paid in the future based on how well you work with robots."[39]
2. **Build your human interaction skills.** Emphasize skills and opportunities that require extensive forms of human communication and interaction: managing, leading, negotiating, teaching, coaching, selling, persuading, and caregiving. Cultivate your social capital.
3. **Create value around your special strengths.** Specialize in a niche in which your talents and skills are rare and valuable. Understand the value you can bring to others and be prepared to morph and adapt as the labor environment evolves.

(For more ideas, visit the *Getting Smart* guest blog by middle school teacher, Amber Chandler: "Would You Rather be Traditional or Prepare Students for the Future?")

The four MyWays domains, we believe, provide the conceptual mapping of competencies needed to develop strategies such as those above and forge student success in the new economy.

The weak labor market (Roadblock 1) and accelerating automation (Roadblock 2) are restructuring the world of work in other ways that challenge young workers. One of those ways is the shift to an *on-demand workforce*, in which part-time, temporary, and "gig" workers perform more and more of the work. We turn next to the impact of this roadblock on under-30s.

ROADBLOCK 3. The hard shift to an on-demand workforce

"In more and more workplaces, the employment relationship has been broken into pieces, often shifted to subcontractors, third-party companies, or, more troubling, to individuals who are treated as independent contractors."

—David Weil and Tanya Goldman in *Perspectives on Work*[40]

Along with accelerating automation, today's students and under-30s face a second restructuring in the labor market: the shift from regular payroll jobs to on-demand, shorter-term employment. Way back in 1993, *Time* magazine heralded this transformation in *"The Temping of America"*:

> America has entered the age of the contingent or temporary worker, of the consultant and subcontractor, of the just-in-time workforce — fluid, flexible, disposable. This is the future. Its message is this: you are on your own. For good (sometimes) and ill (often), the workers of the future will constantly have to sell their skills, invent new relationships with employers who must, themselves, change and adapt constantly in order to survive in a ruthless global market.[41]

Twenty-five years later, experts estimate that approximately four out of every 10 workers are temporary, part-time, contingent, freelance, or self-employed.[42] While the Bureau of Labor Statistics does not have reliable data on these trends, it is probable that more than half of under-30 workers are on-demand workers. Among people employed by the Fortune 100, 20–30% are now working on a short-term basis, either as independent contractors or temp workers.[43]

The working world has become an inscrutable maze of part-time jobs, temporary gigs, and full-time positions that abruptly dissolve into layoffs and start the entire disorienting cycle again.

—Ronald Brownstein

McKinsey explains the business perspective:

> Technology makes it possible for companies to manage labor as a variable input rather than a fixed one. Using new resource-scheduling systems, they can staff workers only when needed — whether it's for a full day or a few hours. In our survey, more than half of employers expected to use more part-time, temporary, and contingent workers in the years ahead. This trend is driven partly by concerns over the strength of the current recovery, but many employers say they will continue to employ contingent workers for flexibility and to better use their permanent workforces.[44]

In fact, these forms of on-demand work are part of a larger strategy by big corporations to shed their role as direct employer in a process that Boston University School of Management's David Weil, a leading expert in the field, calls *fissuring*:

> From the perspectives of CEOs and investors, fissuring — splitting off functions that were once managed internally — has been a phenomenally successful business strategy, allowing companies to become more streamlined and drive down costs. Despite giving up direct control to subcontractors, vendors, and franchises, these large companies have figured out how to maintain quality standards and protect the reputation of the brand. They produce brand-name products and services without the cost of maintaining an expensive workforce. But from the perspective of workers, this lucrative strategy has meant stagnation in wages and benefits and a lower standard of living — if they are fortunate enough to have a job at all.[45] [For more, see this five-minute interview with Weil.]

"The key to this talent-on-demand model," says McKinsey, "is the availability of workers with specialized skills who are willing to work on a contingent basis."[46] That availability is likely to continue because, as we have seen, we are caught in a chronically weak labor market that is unlikely to rebound in a substantial way. With so little leverage, workers are subject to low wages, negligible benefits and

security, and poor (and sometimes exploitative) working conditions. Furthermore, the training, mentoring, and advancement that younger workers need is often far more difficult to secure in on-demand environments; to illustrate, see the story of two janitors at two top companies (sidebar), one a direct employee at Kodak in the 1980s, the other works today for a cleaning contractor at Apple.[47]

There was a time when a temp job was a pathway to a permanent position; however, research by Susan Houseman, an economist at the Upjohn Institute of Employment Research, shows that today only 27% of such assignments lead to permanent positions.[48] While some workers love the freedom and flexibility of on-demand work, many others participate involuntarily as a last resort.

Some workers turn for income to gig platforms like Uber, Lyft, Postmates, Instacart, TaskRabbit, MechanicalTurk, Elance, Upwork, or any number of other similar services. Many times, this work is performed virtually, with little or no supervision or chance to learn from more experienced workers. Further, a car or computer or phone may be required — assets that not all young workers can afford.

How the on-demand economy roadblock impacts students

In his article, *Children of the Great Recession*, Ronald Brownstein describes the roadblock that the on-demand economy presents to students and under-30s:

> The working world has become an inscrutable maze of part-time jobs, temporary gigs, and full-time positions that abruptly dissolve into layoffs and start the entire disorienting cycle again.[49]

Today's generation is the first to confront and attempt to reconcile two employment realities: the practical merits and tradeoffs inherent in the on-demand economy on the one hand, and the long-range career development benefits of more "permanent," payrolled jobs on the other. To navigate this maze, middle school and high school must help students acquire awareness, stra tegies, competencies, and tools not needed by previous generations who were able to enter the labor market through more permanent, payrolled jobs. As we explore next, another important quandary for young people is a growing bias on the part of employers to hire workers with previous work experience, both general work experience and in the specific job being filled.

To understand rising inequality, consider the janitors at two top companies, then and now (NY Times, 9/3/17)

Gail Evans began her career as a janitor at Kodak in the early 1980s. A full-time employee of the company, she received benefits including tuition reimbursement, and quickly converted job opportunities within Kodak into a career as a technology executive.

Marta Ramos is a janitor at Apple but works for a cleaning contractor. No benefits, tuition reimbursement, or promotion prospects that a full-time employee of Apple might receive.

ROADBLOCK 4. A bias for hiring experience over potential

"To get a job, you have to have that job already. It's a Catch-22 situation for workers — and it's hurting companies and the economy."

—Peter Cappelli, *Why Good People Can't Get Jobs*[50]

When labor is in short supply — broadly or within narrow niches — employers give great attention to training and employee retention, with workers enjoying higher wages and better working conditions. Unfortunately, the abundance of labor has created a buyer's market in which labor is increasingly seen as a commodity and employers pay lower wages, gut their investments in training and retention, and impose exploitive work policies. Analyzing the employment prospects for teens and young adults, Andrew Sum and his team at the Brookings Institution concluded:

> While labor market problems affected all young people, some groups had better outcomes than others: Non-Hispanic whites, those from higher income households, those with work experience, and those with higher levels of education were more successful in the labor market. **In particular, education and previous work experience were most strongly associated with employment.**[51] [emphasis added]

In fact, the expectation of previous work experience now plays so prominently in the hiring decisions of employers that it merits attention as the fourth roadblock to employment in this new economy. The so-called "skills gap" that employers commonly report is actually unrealistic expectations of previous experience, argues Peter Cappelli in *Why Good People Can't Get Jobs*:

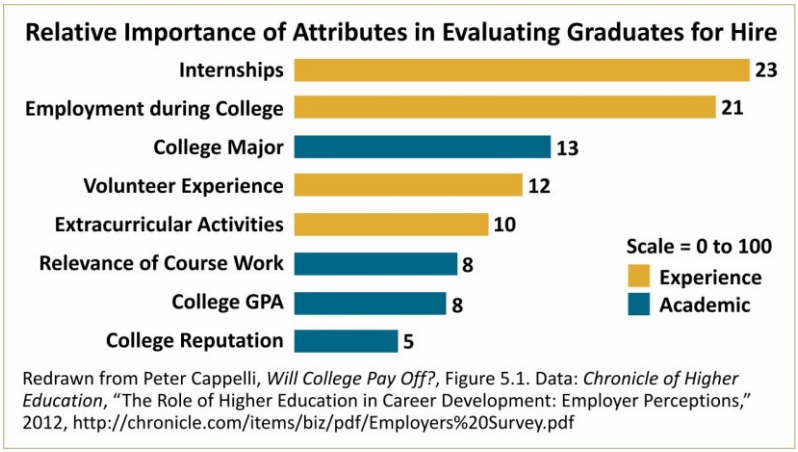
> When we look at the facts, there is no evidence to support [a skills gap]. "The real culprits," I wrote, "are the employers themselves. With an abundance of workers to choose from, employers are demanding more of job candidates than ever before. They want prospective workers to be able to fill a role right away, without any training or ramp-up time."[52]

The conundrum directly affects young people looking for work after high school or after completing a two- or four-year college program. Without experience, you can't get a job. For example, Sum's team calculates that the number of employed teens is falling, even during periods when total employment is growing.[53] They found that "the share of teens with any paid employment throughout the year dropped from 55 percent in 2000 to 28 percent in 2011." Their study of the 100 top metropolitan areas found that 80% of Asian, black, and Hispanic teens were jobless year-around, as were 65% of whites.[54]

With respect to college students, Cappelli reports:

> What employers want from college graduates now is the same thing they want from applicants who have been out of school for years, and that is job skills and the ability to contribute now. That change is fundamental, and it is the reason that getting a good job out of college is now such a challenge.[55]

The bias for job skills and the ability to contribute immediately is so strong, in fact, that four of the top five attributes in evaluating college graduates for hire were related to experience rather than academic performance, according to a 2012 employer survey[56]:



Redrawn from Peter Cappelli, *Will College Pay Off?*, Figure 5.1. Data: *Chronicle of Higher Education*, "The Role of Higher Education in Career Development: Employer Perceptions," 2012, http://chronicle.com/items/biz/pdf/Employers%20Survey.pdf

What happens to college graduates who don't have the work experience to land a job they studied for? Cappelli explains that they take lesser jobs and bump less-qualified workers:

> The reality is that the lower unemployment rate for college graduates comes from the fact that college graduates can also do the jobs that require only a high school degree, and arguably do them better, so they win the competition for those openings. When applicants far outnumber job openings, the overqualified bump out those only adequately qualified.[57]

The same dynamic is in play when an older college grad with work experience bumps a recent grad with less experience. When young college grads fill jobs with lesser requirements, underemployment increases and their income falls. One byproduct of this buyer's market is degree inflation — employers' insistence on a college degree as the minimum requirement for lower-skill jobs like barista or cab driver.

Of course, the prior work experience requirement is most problematic and damaging to those seeking their first job, regardless of their education level. That first job is truly important as the bottom stop on the career elevator, as well as for a host of socioeconomic, psychological, and health reasons.

One partial way to circumvent this roadblock is to persuade employers to shift from focusing on work experience to looking for demonstrations of a job's skills and competencies. Some companies, most notably those in computer programming, are doing just that. While such employers often use a degree in a perfunctory way as an applicant screening/signaling mechanism, it is not the same as "proof" that a person can properly perform a job. Accordingly, schools and youth-serving organizations can help students at all levels of educational attainment to demonstrate and validate their general work readiness and their specific competencies to perform the tasks at hand.

The other side of the same coin — the gutting of employee training

Another consequence of employers' expectations of prior work experience is their substantial disinvestment in employee training. With respect to the old human resources axiom about "making or buying" human capital (that is, training employees up or hiring higher-skilled workers instead), the pendulum has swung far in the 'buy' direction by hiring workers with the skills to be instantly productive, farming work to temporary or contract workers, and shifting investment from training (the "make" option) to automation.

Employers in many other countries have a much stronger tradition of working closely with K-12 and postsecondary institutions to ensure that school prepares young entrants for the labor market.

—Nancy Hoffman
Jobs for the Future

Cappelli quantifies the trend:

> In 1979, young workers received on average about 2.5 weeks of training per year. By 1991, census data found that only 17 percent of employees reporting had received any formal training over the past year. Several employer surveys around 1995 indicated that somewhere between 42 and 90 percent of companies offered some training — the lower number indicating more programmatic training — but the total amount of training an individual received per year averaged just under 11 hours…. Most recently, in 2011, the global management consulting firm Accenture surveyed US employees and found that only 21 percent has received any employer-provided formal training in the past five years. In other words, nearly 80 percent of today's workforce is doing jobs with no recent instruction, if any at all, in five years.[58]

Apprenticeship programs have been eliminated or sharply curtailed.[59] For example, despite large-scale apprenticeship programs at virtually all major manufacturers, one manufacturing expert estimates that only about 18,000 apprentices exist in the entire industry — the equivalent of just over one-tenth of 1% of the manufacturing workforce.[60]

One of the downsides of the on-demand economy can be seen in Cappelli's explanation:

> Employee flight is certainly a reasonable fear, but it is one compounded by an environment in which every employer wants trained workers and no one wants to pay for their training. If companies know that their competitors are also trying to hire experienced workers who can "hit the ground running," they don't want to pay to train someone who will soon work for another company. Of course, this across-the-board intransigence virtually guarantees that it will be increasingly hard for any company to find qualified applicants, which will make long-term vacancies more and more common.[61]

How the experience bias roadblock impacts students

The implication of the experience-over-potential roadblock, and the danger of diminished career prospects, is that we can no longer assume that work experience can be an afterthought in K-12 education.

We must make deliberate accommodations for students to acquire work experience during their high school years — including reimagining, reinventing, and dismantling the wall between school and work. As William Symonds and his colleagues emphasize in *Pathways to Prosperity*, work experience must be part of a broader vision of school reform — a theme we will continue to explore in future reports.[62]

Commenting on the current bias among US employers in favor of short-term over long-term gains, Nancy Hoffman at Jobs for the Future notes:

> Employers in many other countries have a much stronger tradition of working closely with K-12 and postsecondary institutions to ensure that school prepares young entrants for the labor market.[63]

Perhaps such partnerships can relieve some of the crisis in this country. Meanwhile, the cost and risk of training, even for technical jobs, now falls on the worker, a topic we return to in Report 3, *5 Decisions in Navigating the Work/Learn Landscape*.

Before offering key takeaways about these labor market challenges, we discuss one last roadblock: the onerous hiring processes resulting from software-driven hiring and unrealistic employer expectations.

ROADBLOCK 5. The job-hunting labyrinth

> *"You want the job-market to be a hiring game. But the employer regards it as an elimination game — until the very last phase."*
>
> —Richard N. Bolles, *What Color is Your Parachute?*[64]

Networking. Dropping off a resume. Filling out a paper application. In some settings, job hunting still works like this; however, increasingly, the application process bears little resemblance to these traditional, face-to-face methods. Today, job openings are blasted out to online job sites and applications are screened electronically by applicant-tracking systems driven by algorithm. Cappelli explains the logjam and chaos that can ensue:

> Employers are overwhelmed by applications, and there is no way they can go through them all manually. So they use these systems to help. The downside is that the screening criteria are imperfect. Typically the screening software looks for key words, and if an applicant doesn't include the right key words, out goes his application.[65]

Cappelli describes one company that had 25,000 applicants for a standard engineering position — and the HR people said that not one of those applicants was qualified! Furthermore, in this new automated application process, applicants are at the mercy of the machine, rarely talking to anyone, even by email.

Young applicants — who lack previous work experience, human advocates, or familiarity with digital job hunting — are operating at a distinct disadvantage.

Here's how *What Color is Your Parachute?* describes what job hunters experience:

> Since 2008, the average number of people applying for any given job has been 118. Knowing that there is such a large pool of applicants, many employers are now *over-screening*. They are tightening the parameters around who they will even consider. *"Must be currently employed,"* is the biggest change since 2008. *"Must have direct hands-on experience with this population,"* is another. Thus, in one way or another many employers now reject candidates they would have cheerfully hired eight years ago. Reason: with the recovery still unsteady and slow, employers are more averse than ever to taking risks, so they keep thinking that now with all these unemployed out there, maybe somebody better will come along next week. Of course, this ideal employee some employers are looking for, may not even exist. But even as a myth, this idea of "a better employee than the one I'm currently interviewing" definitely affects hiring plans. Not all employers think this way; but way too many *do*.[66]

In part as a result, many job searches are taking longer. For example, data from the Bureau of Labor Statistics (chart) shows that 25.9% of unemployed workers spend 27 weeks or more to secure a new job, up from 18.3% 10 years ago.[67]

Duration of unemployment, 2007-2017, as a percentage of all unemployed workers

	July 2007	July 2017
Less than 5 weeks	35.4	30.9
5 to 14 weeks	31.2	29.3
15 to 26 weeks	15.2	13.9
27 weeks and over	18.3	25.9

Source: Bureau of Labor Statistics
https://www.bls.gov/webapps/legacy/cpsatab12.htm

The temp marketplace and the gig marketplace present even more confusion and complexity for the job hunter. (It is a great irony that, while many permanent employers have cut training, temp agencies often help temporary workers build their skills because they can hire out people at better wages when they do.[68])

How the job-hunting labyrinth roadblock affects students

Even in well-to-do families, the modern job-hunting labyrinth of software-driven hiring and unrealistic employer expectations is a daunting roadblock for young job seekers. Furthermore, less advantaged students face even more onerous odds — apart from the academic achievement gap — stemming from less work-based experience, social capital, linguistic/cultural familiarity, Internet access, and financial resources. Young job seekers of all socioeconomic backgrounds need the pathways and tools to navigate this labyrinth and make a successful transition from school to work. The alternative is the further worsening of our youth employment crisis.

Labor market takeaways for next generation educators

For much of its history, the US led the world in public education, producing a skilled workforce that helped drive economic growth and worker prosperity. Today, we have a modern, vibrant economy, but workers in general — and young people in particular — are getting crushed by technological change and shifts in the role of labor. Our future as a nation and our obligation to future generations hinges on quickly reimagining and restructuring education so that adolescents in today's age of accelerations — regardless of family background — develop the competencies to survive and thrive in a fast-changing economy that overwhelmingly favors high-skilled workers. We recap here the roadblocks that stand in the way:

Recapping the 5 Roadblocks facing aspiring young workers today

1. **A chronically weak labor market**
   The Great Recession exacerbated a multi-decade slowdown in employment growth that often puts younger, less experienced workers at the back of the line for job openings. The job market is requiring more and more preparation for lower and lower starting wages. College is no longer a safe harbor — unemployment and underemployment are rampant for younger college graduates while wages are down. Teen employment is withering; for urban, low-income teens of color, the odds of having a job — any job at all — now stand at roughly 10%.

2. **The accelerating pace of automation**
   From 1998 to 2013, the US economy grew by 43% (inflation-adjusted) while total labor-hours remained unchanged as a result of increased productivity. The conclusion of many experts is that we have entered a "second machine age," in which enormously powerful computing is merging with increasingly sophisticated "mechanical muscles." Many routine jobs are being engineered away and software bots are increasingly able to perform complex, predictable work — such as financial analysis, legal discovery, and medical imaging interpretation — that heretofore were solely in the human domain.

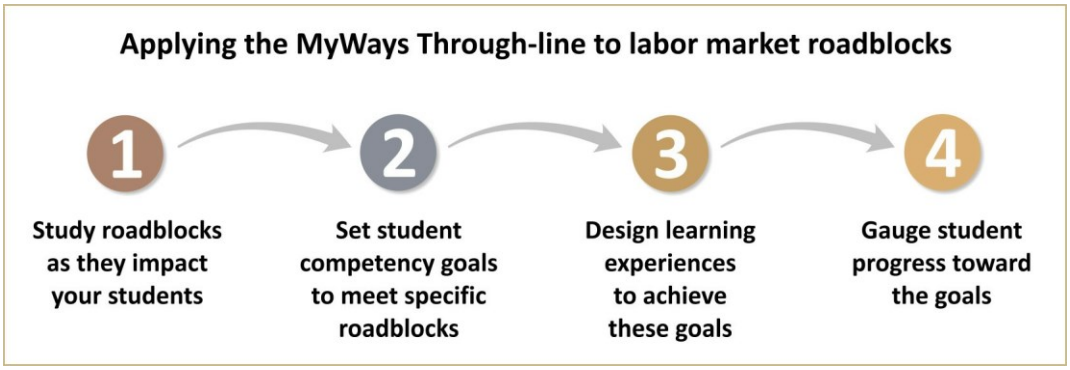
3. **The hard shift to an on-demand workforce**
   Today's students face a second restructuring of the labor market: the shift from regular payroll jobs to on-demand, shorter-term employment. Approximately four out of every 10 workers today is temporary, part-time, contingent, freelance, or self-employed. Gig platforms such as Uber, TaskRabbit, and Upwork are expanding but require experience and assets such as a car, computer, or phone that not all young workers can afford. One writer calls the current working world "an inscrutable maze of part-time jobs, temporary gigs, and full-time positions" that can abruptly dissolve.

4. **A bias for hiring experience over potential**
   The abundance of labor has created a buyer's market in which labor is increasingly seen as a commodity. Choosy employers now put a premium on previous work experience and job skills to ensure immediate contribution. Workers with more experience or education routinely bump younger workers, who are typically less experienced and less educated workers into lower-skill jobs. The abundance of experienced workers has also resulted in employers slashing employee training programs.

5. **The job-hunting labyrinth**
   Today, job openings are blasted out to online job sites while application-tracking systems screen applications electronically. Applicants often never communicate with a human, even by email, and excessively narrow, and sometimes arbitrary, job requirements often knock out even highly qualified applicants. A quarter of unemployed workers are spending more than six months looking for work and, while the temp marketplace and gig marketplace offer an alternative, this avenue can also be uncertain, confusing, and complex.

This is the new world of work: full of possibility but also great risk, particularly for those entering the labor market with little experience. While virtually all students will encounter these roadblocks, those with lesser skills and those from less advantaged backgrounds will find them especially challenging. Nevertheless, every student will need the tools to navigate the work/learn landscape.

The MyWays Student Success Framework outlines the general direction we need to go: focus on each student's Habits of Success for personal effectiveness; strengthen their Creative Know How to create value; deepen their Content Knowledge about a complex, information-rich world; and add Wayfinding Abilities to transition through these roadblocks to new learning, work, and life opportunities. To align next generation learning with the world today, we encourage educators to apply their own version of the four-question through-line that guided the overall MyWays Project (see *Introduction and Overview of the MyWays Student Success Series*) to each of the five reports that comprise Part A, "Adolescence in an Age of Accelerations." To apply the through-line to the labor market roadblocks, treat each roadblock as a specific, well-defined learning design challenge. First, study the roadblocks as they impact your school's students (see graphic below). Next, set student goals for each competency that you feel will be essential to overcoming the roadblocks. Third, design learning experiences to achieve those competency goals (referring to the resources in Parts B and C of the *MyWays Student Success Series* for assistance). Finally, gauge student progress toward those goals by applying assessment principles described in Report 12. (For tools and exercises related to the MyWays Through-line, see the Tools section of the MyWays website.)



Based on the 5 Roadblocks described in this report, here are key labor market takeaways for next generation educators:

Takeaway 1: The first shift in thinking that must be made is that "average is over." Graduating with the same skills and abilities as myriad other high schoolers is a distinct competitive *disadvantage*. Routine jobs are being swept away, yet our economy grows, new opportunities are spawned, older workers retire, and those who create value (relative to others) continue to get ahead. To find success in this new economy, students need to find their individuality — what developmental psychologist Todd Rose calls their "jaggedness"[69] — and be nurtured in environments that can help them identify and develop their strengths along with the fundamentals, and figure out where they can create value. (We return to this topic in Report 5.)

Takeaway 2: We need to pivot from "getting the right answer without making mistakes" to acquiring strategies for surviving and thriving in a more Darwinian time, as Reid Hoffman and Ben Casnocha describe in *The Start-Up of You*:

> The conditions in which entrepreneurs start and grow companies are the conditions we *all* now live in when fashioning a career. You never know what's going to happen next. Information is limited. Resources are tight. Competition is fierce. The world is changing. And the amount of time you spend at any one job is shrinking. This means you need to be adapting all the time.[70]

Not everyone needs to start a business in the traditional sense, but our lives are now creative enterprises and the scripts we follow are increasingly ones that we write ourselves. The goal, as business guru Seth Godin says, is "to bring your best self to the marketplace and be rewarded for it."[71] Hoffman and Casnocha remind us that, in many ways, we are returning to our pre-industrial, pre-labor roots, quoting Muhammad Yunus, the microfinance pioneer and Nobel Peace Prize winner:

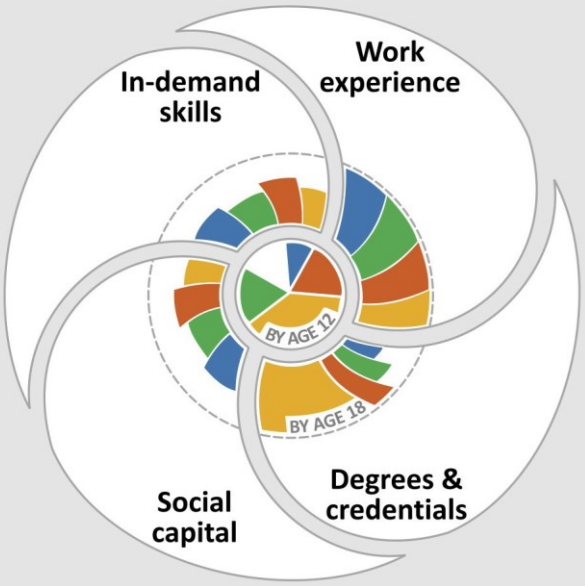
> All human beings are entrepreneurs. When we were in caves, we were all self-employed … finding our food, feeding ourselves. That's where human history began. As civilization came, we suppressed it. We became "labor" because they stamped us, "You are labor." We forgot that we are entrepreneurs.

We salute Yunus's optimism; he is a great pioneer, fostering entrepreneurial creativity among the poorest of the poor. Yet, as educators, we need to remember that these adaptive abilities are not innate. Young people cannot throw a switch at age 18 and suddenly have the experience and judgment to navigate in a world of uncertain possibility; instead, we need K-12 and postsecondary schools that foster meaningful design thinking and entrepreneurial learning, including their application to the bootstrapping of careers.

Takeaway 3: Labor market and hiring trends suggest that, in today's competitive economy, the making of a career (including college and other postsecondary education) involves the continual interplay of four components: *in-demand skills* to create value in the real world, *work experience* as evidenced by jobs and promotions, *degrees and credentials* as screening/signaling indicators of competence, and *social capital* for support, access, and resources. Together, we envision these four elements as part of an "***opportunity engine***" — a simple but meaningful MyWays model of career development in the 21st century. Just as the engine of a car converts action/activity into propulsion, the opportunity engine harnesses the collective force of four components, or blades, to propel each of us forward on our career-building journey. Unlike a car engine, however, the opportunity engine grows and matures over time; our careers are in "permanent beta," as Hoffman and Casnocha remind us,[72] as we continuously improve and adapt each blade of our personal engine to the changing circumstances and opportunities we encounter during the wayfinding decade and beyond.

The "opportunity engine" is a simple but meaningful model of career development in the 21st century

Students, like more experienced adults, must continuously improve and adapt each blade of their personal opportunity engine to the changing circumstances and opportunities they encounter. Employers today are evaluating for all four components.



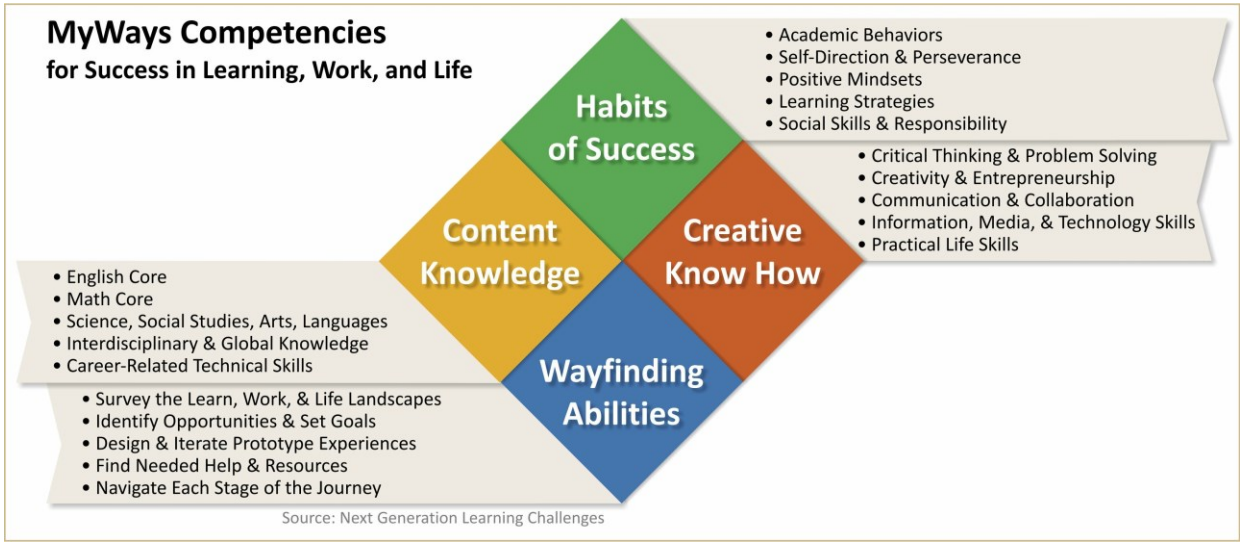
We build our individual engines over time from the center out as we age — as in this example of a hypothetical graduating high school senior. Colors symbolize how this student's competencies (each a color of a MyWays domain) have developed with significant achievement in work experience, in-demand skills, and social capital along with a high school diploma. See Report 3 for more information.

Habits of Success | Creative Know How | Content Knowledge | Wayfinding Abilities

The four blades of the opportunity engine are not new; they are the same components that employers have evaluated for years. What's new, however, is that *work experience*, *in-demand skills*, and *social capital* are now being evaluated for young applicants, along with their *degrees and credentials*, just as they are for seasoned workers.

An exercise: consider the evolution of your own opportunity engine. *What were its contours when you left high school, when you started your first real job, and when you made your first career change?* The thesis behind the opportunity engine construct is that these four components, or blades, have always been helpful in navigating college and career, but in today's competitive labor market, all four elements *must* be present for college-career advancement.

We already know, for example, that the high school degree-holder without work experience, marketable competencies, or social capital is unlikely to find career-advancing employment or even, in many cases, career-advancing postsecondary education. The same is true for the college graduate who, despite earning a degree, lacks previous work experience and social capital and cannot demonstrate the specific skills and competencies that an employer values. For both the high school degree-holder and the college graduate — as important as these credentials are — work experience, marketable competencies, and social capital have also become indispensable.



Takeaway 4: The 20 MyWays competencies relate to the opportunity engine's four blades in two ways. First, the inclusion of the Wayfinding Abilities domain as a full quadrant of the MyWays Student Success Framework covers the basic competencies involved in both career/life advancement and entrepreneurial pursuit: *survey the landscape*; *identify opportunities and set goals*; *design and iterate prototype experiences*; *find needed help and resources*; and *navigate each stage of the journey*. These skills require resiliency as well as adaptability, as students must learn when to persist with a plan and when to pivot elsewhere if a plan is not working.

Second, all 20 of the MyWays competencies support development of students' opportunity engines:

- **Habits of Success** addresses personal development, resourcefulness, and resolve. Although the competencies in this domain are based on the University of Chicago Consortium on School Research's model for academic performance, we are confident that they transfer meaningfully into the career realm, bolstering the development of marketable competencies, work experience, and social capital, as well as degrees and credentials. (Report 7)

- **Creative Know How** encompasses general skills that are central to students' own creative ventures and highly valued in the workplace, such as prowess with technology and working effectively with others. As a result, Creative Know How is frequently the domain where reside the job-specific marketable competencies that employers seek. (Report 8)

- **Content Knowledge** emphasizes a broader and deeper ability to apply ELA, math, and other academic knowledge to solving real-world problems. Cultivation of Career-Related Technical Skills is explicitly added, as is Interdisciplinary and Global Knowledge of economic, environmental, civic, and cross-cultural issues. (Report 9)

- **Wayfinding Abilities**, discussed above, focus directly on a young person's ability to navigate transitions or new initiatives in three areas: 1) specific learning, work, or life transitions such as moving from middle school to high school or high school to college, adapting to a new culture or

> community, or beginning a new job or real-world experience; 2) adding new competencies, experiences, relationships, and credentials to their opportunity engine; and 3) applying the Wayfinding competencies on a group project within a learning or work setting. (Report 10)

For a full description of the MyWays competencies, see Part B, "Broader, Deeper Competencies for Student Success."

Before moving ahead, a clarification needs to be made between the MyWays competencies and the *in-demand* blade in the opportunity engine construct. While the MyWays competencies aid broadly in all aspects of work, learning, and life advancement, in-demand skills are the job-specific subset of skills that qualify a person, in an employer's eyes, to be a lifeguard, a research biologist, a Farsi interpreter, or a next generation middle school teacher. A young person with both broader, deeper competencies and specific job skills valued by employers is likely to succeed.

As noted in the *Introduction and Overview of the MyWays Student Success Series*, the MyWays Student Success Framework was developed with consideration for career bootstrapping, equity and economic mobility, and whole-person development. (A fourth design consideration was the interoperability between various frameworks used by schools and organizations.) In this report, we have highlighted the *5 Roadblocks to Bootstrapping a Career*, noting here the role of MyWays competencies in helping young people develop an opportunity engine to maneuver through these roadblocks. In the following report, we look at the MyWays competencies and opportunity engine in the context of the *5 Decisions in Navigating the Work/Learn Landscape*. Despite an emphasis on economic opportunity for young people, the MyWays competencies also underpin broad personal development, self-awareness, global citizenship, academic performance, and self-actualization. In addition, the framework is designed with the flexibility to serve both college-going students and those seeking to begin their journey directly in the workplace or in a short-term certificate program.

Takeaway 5: Preparing students to be ready for what follows high school requires far more real-world immersion and authentic learning than is typically provided. As the 5 Roadblocks reveal, students must now compete toe to toe with older, more experienced workers in a more uncertain and complex labor market. The earlier that students and under-30s begin constructing their unique opportunity engines, the smoother their entry into the economy will be. It is equally true that most of the competencies identified in the MyWays framework require an integration of higher thinking skills and real-world abilities — an integration that traditional classroom learning cannot achieve alone. We conclude with three constructs that are particularly helpful in creating authentic learning experiences that students need:

- **Whole Learning, through junior versions.** Developed by David Perkins at Harvard's Project Zero, Whole Learning combines seven key principles of effective authentic learning. Perkins argues that broader, deeper competencies require educators to "honor the whole" — by creating "junior versions" of real-world experiences that are developmentally appropriate. Quality project-based learning, extracurriculars, and some community service projects have applied these principles for years (for more on this, see Report 11).

- **Wider Learning Ecosystem.** The universe of learning options beyond formal K-12 education has never been richer, spanning *school-based extracurriculars*, *college-based learning*, *career-related learning*, *community-mediated learning*, and *everyday formal and informal learning*. The US, in particular, has a fertile if untamed Wider Learning Ecosystem that students should acclimate to while in K-12, as they will be relying on it repeatedly as they work and learn in the years after high school (for more, see Report 11).

> ***Each of us has our own web of development, where each new step we take opens up a whole range of new possibilities that unfold according to our own individuality.***
>
> —Kurt Fischer
> Harvard Graduate School of Education

- **Levers for Capability and Agency.** Research suggests that *competence* is the union of capability and agency, where *capability* is knowledge and the understanding to use it in real-life situations and *agency* is a deep and durable self, acting to shape one's development and environment. Learning science provides eight levers for fostering capability and agency (for more, see Reports 5 and 11).

As next generation learning embraces new constructs like those above, traditional test-based assessment methods break down. Two paradigm shifts are needed: the shift to greater authenticity and the shift to multiple and varied measures. Report 12 summaries our research on assessment design for broader, deeper competences.

Takeaway 6: Our final takeaway is that one response to the change and upheaval in the labor market is a marked increase in just-in-time learning. In the face of technological change, both Kaplan (*Humans Need Not Apply*) and Cappelli (*Will College Pay Off?*) believe that long periods of education are impractical and financially risky for the learner. Instead, they envision learning and work woven together (or, at worst, young people having shorter learning-to-work cycles). The explosion in certificate and badging programs, for example, opens opportunities to begin doing meaningful work earlier while furthering one's education and earning income. There is also a rise in Bachelor's degree programs that are shorter in duration or embed apprentice and work experience.

Combining work and learning is challenging and requires considerable self-management. Nevertheless, experience in authentic settings, with all the variety and serendipity that can unfold there, can be an important source of inspiration and self-discovery. As psychologist Kurt Fischer remarked on his research into how individuals develop: "Each of us has our own web of development, where each new step we take opens up a whole range of new possibilities that unfold according to our own individuality."[73]

The truth is that the working learner is already the new normal as we learned in the previous Report 1, *Opportunity, Work, and the Wayfinding Decade*. Next, we examine the work/learn landscape in greater detail in Report 3, focusing on the *5 Decisions in Navigating the Work/Learn Landscape*, the second part of the 5-5-5 Realities.

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