Building an Adaptive American Workforce for an Evolving Future of Work

MGM RESORTS
PUBLIC POLICY
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Table of Contents

Message from the Co-Chairs

There is no more important issue facing our country than securing the American workforce of the future—empowering people to achieve their potential and build sustainable communities where they can thrive. We fought for these ideals during our service in public office, and we remain dedicated to these ideals today. We are proud to co-chair the MGM Resorts Public Policy Institute at UNLV, which seeks to bring these issues into the national conversation and identify and elevate bipartisan solutions that will improve lives across our nation. Thank you for your partnership and commitment to this endeavor.

The Honorable Harry Reid
Former U.S. Senate Majority Leader

The Honorable John Boehner
Former Speaker of the U.S. House of Representatives

Introduction

This paper, *Building an Adaptive American Workforce for an Evolving Future of Work*, lays out the key focus areas of the MGM Resorts Public Policy Institute at UNLV. Our goal is to identify and elevate bipartisan solutions that address the evolving future of work, and connect the best ideas and perspectives on issues facing American workers, communities, and businesses.

One of the most important of these issues is the ongoing transformation of the U.S. economy and its implications for the workforce. Driven by technological advances, globalization, and demographic change, this transformation presents pressing challenges – but also historic opportunities.

This paper examines a core question for the work of the MGM Resorts Public Policy Institute at UNLV:

> *As America transitions to a knowledge-driven economy, how can the private sector, government, and academia work together to address the future of work – developing cross-sector solutions that empower workers with the skills they need to be successful both in adapting to today's job market and filling the jobs of the future?*

By exploring this question through case study research, convenings, content curation, and pilot programs, the Institute works to identify, elevate, and accelerate unique approaches that will enable the United States to seize these opportunities.

Disruption:
The Challenges Facing American Workers

Despite strong macroeconomic figures, millions of American workers face significant challenges in a rapidly changing economy. Over the past several decades, the United States has shifted from a manufacturing-based economy to a knowledge-based economy, triggering ongoing disruptions for many occupations, industries, and geographies.

This has brought change – both positive and negative. New in-demand skills and well-paying jobs have risen, others have faded or disappeared, and many more are changing in important and unprecedented ways.

These shifts raise three key areas of concern:

Workers struggling to adapt: Despite a strong economy, millions of workers are struggling to find jobs, build careers, and earn middle-class incomes. Many workers feel like they don't have – and can't acquire – the skills needed to succeed in today's economy:

- Manufacturing jobs – once the bedrock of middle-class American employment – fell by more than 25% from 2000 to 2018.[1] Looking ahead, the Bureau of Labor Statistics (BLS) projects that manufacturing jobs will decline further, falling 4% from 2016 to 2026.[2]
- More than one-third of American workers – including 27% of those with a bachelor's degree – say that they don't have enough education and training to advance at work[3] And 72% say that "a lot" of responsibility falls on individuals to ensure they have the skills and education to succeed in the modern U.S. economy.[4]
- In-demand skills are shifting due to technological change, threatening to leave many workers behind. According to a World Economic Forum survey, the majority of employers expect that the required skills for most jobs will have shifted significantly between 2018 and 2022.[5]

The skills gap widens: The majority of new jobs in today's economy require post-secondary education, skills training, or continuous learning, which leaves out workers with fewer or older skills. As a result, there are both millions of open positions requiring specialized job skills and millions of unemployed Americans who are struggling to identify and attain those skills:

- In 2018, for the first time since record-keeping began, the number of job openings – 6.7 million – surpassed the number of unemployed Americans.[6]
- Middle-skill jobs – those positions that require more than a high school education, but less than a four-year degree – account for 53% of the U.S. labor market. However, just 43% of American workers are appropriately trained for these positions.[7]
- 46% of U.S. employers report difficulty filling needed positions; up from 32% in 2015. Employers say that applicants' lack of experience, hard skills, and soft skills are core causes of this challenge.[8]
- The vast majority of new jobs are going to workers with post-secondary training or college education. From 2010 to 2016, workers with at least some post-secondary education accounted for roughly 11.5 million of the 11.6 million new jobs created, while employment for workers with a high school diploma or less grew by only 80,000 jobs.[9]

Challenges for communities and regions: Many once-vibrant American communities, cities, and regions are struggling, as the manufacturing industry declines, middle-class jobs disappear, and populations shrink:

- Older industrial cities in the Midwest and Northeast have seen slower-growing economies, lower per capita income, higher rates of concentrated poverty, and flat or declining populations, compared to other urban areas.[10]
- In many states in the Midwest and South, a significant share of the population works in occupations that are projected to lose jobs by 2026, even as other states see positive employment prospects.[11]

Opportunity:

Creating an American Workforce for the 21st Century

While there are disruptions, the transformation of the American economy also presents vital opportunities for workers, employers, and communities across the country. By designing and implementing effective, forward-looking solutions, the private and public sectors and academia can collaborate to create an American workforce that is fully prepared for the new economic landscape.

Achieving this vision through smart partnerships and policy is the principal goal of the Institute. We believe innovative, targeted strategies can efficiently re-align the workforce with today's economy. We work to identify those strategies and convene leading expert voices – across sectors and party lines – to discuss and refine solutions for the potential of the 21st-century workforce.

This will lead to cascading benefits:

- Empowering workers to adapt and thrive: Creating new career pathways will equip and connect workers with middle-class job opportunities in dynamic areas of the economy. Not only will this enable individuals to succeed in the present, it will also prepare them to adapt to future economic shifts and thrive throughout their working lives. Incomes will rise as workers advance and succeed, which will help to address growing concerns about the wage gap.
- Building a dynamic workforce that meets skills needs: Efforts to help workers acquire in-demand skills will also benefit employers, building a dynamic workforce that meets their talent needs. This will address existing skills gaps and labor shortages – particularly in occupational categories where demand far exceeds supply – which will fuel economic growth and wide-reaching benefits.
- Reviving sustainable communities: Workforce programs will lift the towns, cities, states, and regions that have suffered economic downturns in recent years. These areas will be able to rebuild and compete, supported by a strong network of skilled workers, future-oriented industries, and innovative, cross-sector partnerships.

Forces:

Three Trends Reshaping the U.S. Economy

Three macrotrends are re-writing the future of the U.S. and global economy: the adoption of advanced technologies, the rise of globalization, and the ongoing shift in demographics. These three forces are determining which skills and jobs are most valuable, which are not, and what paths will be most effective to prepare workers for long-term success.

1. Technology: Rapid advances transform work, skills, and jobs

Artificial intelligence (AI), automation, robotics, and other advanced technologies are driving widespread, accelerating change across the workforce. While conventional wisdom holds that these technologies will only eliminate jobs, there is an emerging consensus that the impacts will be far more varied and complex: disrupting some jobs and creating others – but changing nearly all jobs. Instead of attempting to reverse these advances, effective solutions will need to equip workers to succeed in jobs that are increasingly shaped by technology.

AI and automation: Change, disruption, and opportunity

AI, robotics, automation, and other advanced technologies are projected to impact nearly every occupation and industry in the decades ahead. In the past, automation has been associated primarily with manufacturing job losses, accounting for as many as 88% of the 5.6 million jobs lost in U.S. factories between 2000 and 2010.[12] However, automation is now expanding beyond manufacturing into more areas of the economy than ever before.

Projections vary significantly, but experts generally agree that these technologies will continue to disrupt jobs that involve routine tasks in predictable environments,[13] while creating new jobs that involve social skills, problem-solving, and unpredictable environments. For example, the McKinsey Global Institute's report on automation projects that, between 2016 and 2030, the U.S. will lose 6.6 million predictable physical jobs, such as machinists and cooks, and 4.6 million office support jobs, such as payroll clerks and data entry workers.[14]

However, if businesses and policy-makers take action to capitalize on available economic opportunities, the report predicts that the United States can add more than 13 million jobs in areas like healthcare and professional services.[15] This "step-up scenario" indicates the critical importance of addressing the changes brought by advanced technologies.

Working alongside advanced technologies

While automation will create or eliminate certain jobs, partial automation will change far more jobs. 60% of occupations have at least 30% constituent work activities, or job tasks, that could be automated.[16] As this partial automation occurs, workers will shift to focus on those tasks that require "essential human skills," such as creativity, communication, and problem-solving.[17]

This scenario, where humans work alongside technology rather than being displaced by it, is the future of jobs and the workplace. Consider a few recent examples:

- At a luxury car factory in South Carolina, the introduction of automated processes has enabled workers to shift towards more creative, problem-solving tasks. Since this shift, the plant's workforce and annual production have both more than doubled.[18]
- The introduction of advanced algorithms and artificial intelligence is enabling financial advisors, insurance claims adjusters, and other knowledge workers to focus on customer service and client communication.[19]
- In the hospitality industry, some hotels are beginning to experiment with using robots to free up employees to focus on more meaningful work, such as meeting the higher-level, complex needs of guests.[20]

Disruptions caused by automation can be incredibly difficult for those affected. However, the solution is not turning back technological progress, but empowering workers to adapt, acquire in-demand skills, and, if necessary, pivot into new occupations and industries.

2. Globalization: From goods to services

Globalization is driving America's shift from a manufacturing-based economy that produces goods towards a knowledge-based economy that provides services. While this evolution has eliminated jobs, it is also creating new opportunities in fast-growing industries.

Global trade and job disruptions

As the result of both global trade and automation, manufacturing has fallen from 27% of total U.S. employment in 1960 to just 9% today.[21] The rise of Chinese manufacturing alone is estimated to have eliminated 2 million U.S. jobs between 1999 and 2011, and more than half of these were outside of manufacturing, as effects rippled into other areas of the economy.[22]

As a result, many Americans are skeptical of globalization. 50% of adults believe that trade destroys jobs, and only one-fifth believe that trade creates jobs.[23] This stands in contrast to other

advanced economies, where 44% of people believe that trade creates jobs.[24]

Growth of services and knowledge-based work

Yet global trade has also created jobs for millions of Americans, particularly in services- and knowledge-based work, such as financial services and international travel and tourism. These sectors hold the key to the future of the workforce, especially if policies and programs can help displaced workers gain the necessary skill sets.

The United States is the largest services exporter in the world, and this area is growing at a fast pace. Service exports have skyrocketed from $290 billion in 2000 to almost $800 billion in 2017, representing a trade surplus of $255 billion.[25] International travel to the United States, alone, accounted for more than $210 billion in service exports in 2017 – the largest of any export category.[26]

Global trade also has a positive impact in that foreign companies are significant drivers of U.S. employment. Foreign companies supported 6.8 million American jobs in 2015, representing a 22% increase from 2007.[27] This far outpaced the 3.6% overall private-sector employment growth in the same time period.[28]

These trends indicate the potential for programs that seize on the opportunities of globalization, while also addressing its disruptions. Much like automation, attempts to roll back globalization are likely impossible. Instead, the United States must take a forward-looking approach that prepares workers to succeed in the global economy.

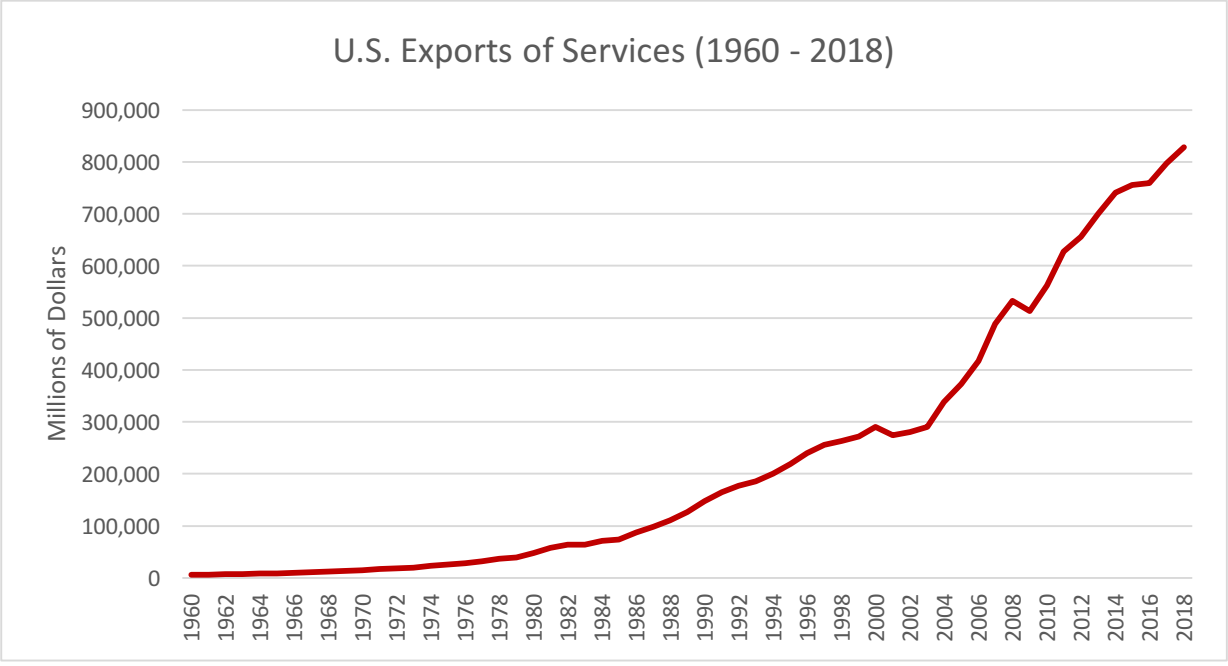

Figure 1: Data from U.S. Exports of Services by "Major Category," United States Census Bureau, 2018, accessed March 1, 2019.

3. Demographics: Workers of all ages drive change

The growing number of older workers and the distinct generational values among younger workers are key demographic factors for the future of work. Together, these changes are challenging traditional workplace assumptions and ushering in new priorities and expectations.

The aging American workforce extends careers

American workers are growing older and working longer than ever before. From 2014 to 2024, the BLS projects that the average annual growth rate of 55+ workers will be more than three times the growth rate of the overall labor force.[29] More than 90% of U.S. workers say they plan to work past 60, and nearly 40% expect to work past age 70, with many citing both financial necessity and a desire to stay active.[30]

This demographic shift will change long-standing models and assumptions, such as full retirement at age 60. Therefore, businesses, policy-makers, and workers will need to collaborate to develop new models that support older talent and longer working lives.

For example, employers are experimenting with phased retirement, which enables older workers to reduce their work hours and take on less stressful roles, instead of retiring outright.[31] Others are creating unique roles for older workers as advisors, mentors, and instructors, and reskilling efforts are helping to prepare older employees to continue working and contributing.[32] However, greater adoption of these programs is needed to support millions of older workers.

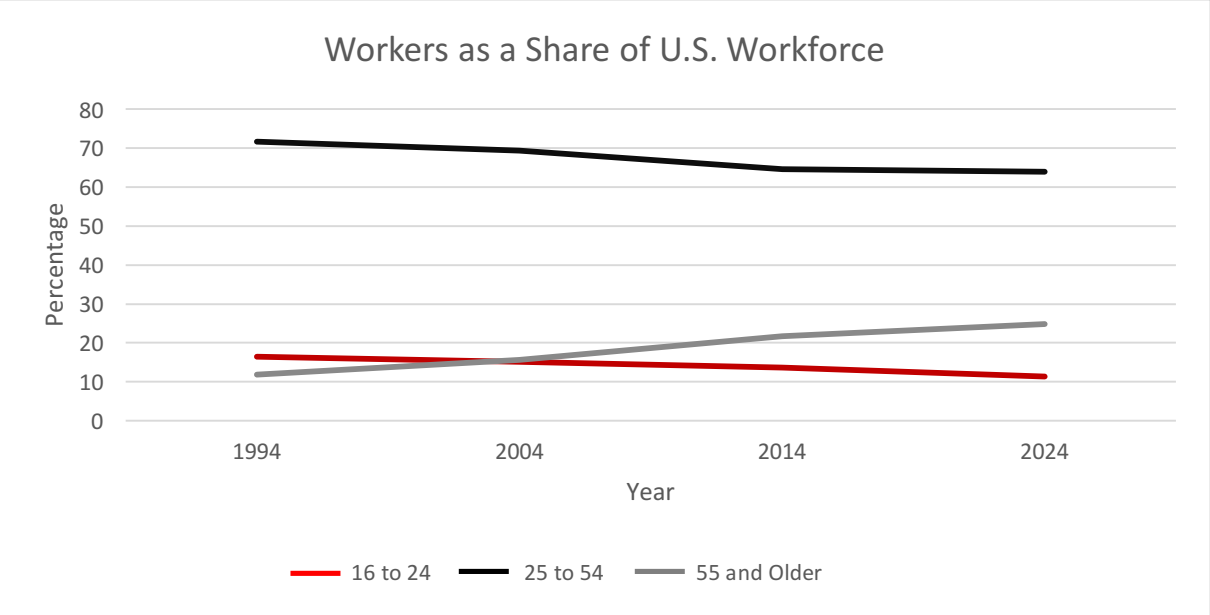

Figure 2: Data from the United States Department of Labor, Bureau of Labor Statistics. Bureau of Labor Statistics (2018) Monthly Labor Review. Retrieved from https://www.bls.gov/opub/mlr/2015/article/labor-force-projections-to-2024.htm.

Younger workers: Unique priorities for jobs and the workplace

At the same time that older workers are extending their careers, younger Millennial workers have rising influence in the workplace. Already, this is the largest generation in the labor force, accounting for 35% of all U.S workers, and this share will only grow.[33]

These workers have unique priorities and expectations for work, with a particular desire for positive workplace culture and development opportunities. In fact, Millennials say that they would take a $7,600 pay cut, on average, for improved quality of work life, such as purposeful work and better company culture.[34] These workplace intangibles are becoming increasingly important for employers to attract and retain talent.

Critically, Millennial workers place a high value on training and development opportunities. More than half of Millennials say that the opportunity to learn and grow is "extremely important" when choosing an employer, compared to less than half of Baby Boomers.[35] And Millennials see training for advanced technologies as an especially important area. 52% of Millennials believe technologies like AI will augment their jobs, yet less than 40% say their employer is helping them prepare for coming technological changes.[36]

Together, the aging of the U.S. workforce and the rise of Millennials will have important implications for the future of work. Americans will need new models for how – and how long – they work, which will frame how the workforce responds to larger changes in the economy.

Implications:

The New Landscape for Skills, Learning, and Jobs

As these three forces transform the environment for American workers, they are generating both new opportunities and new problems. These shifts have opened a growing skills gap and a demand for continuous learning, which – if left unaddressed – threaten to exacerbate negative social and economic impacts. However, if companies, workers, and policy-makers join together, they can develop responses that re-align the U.S. workforce for the new dynamics.

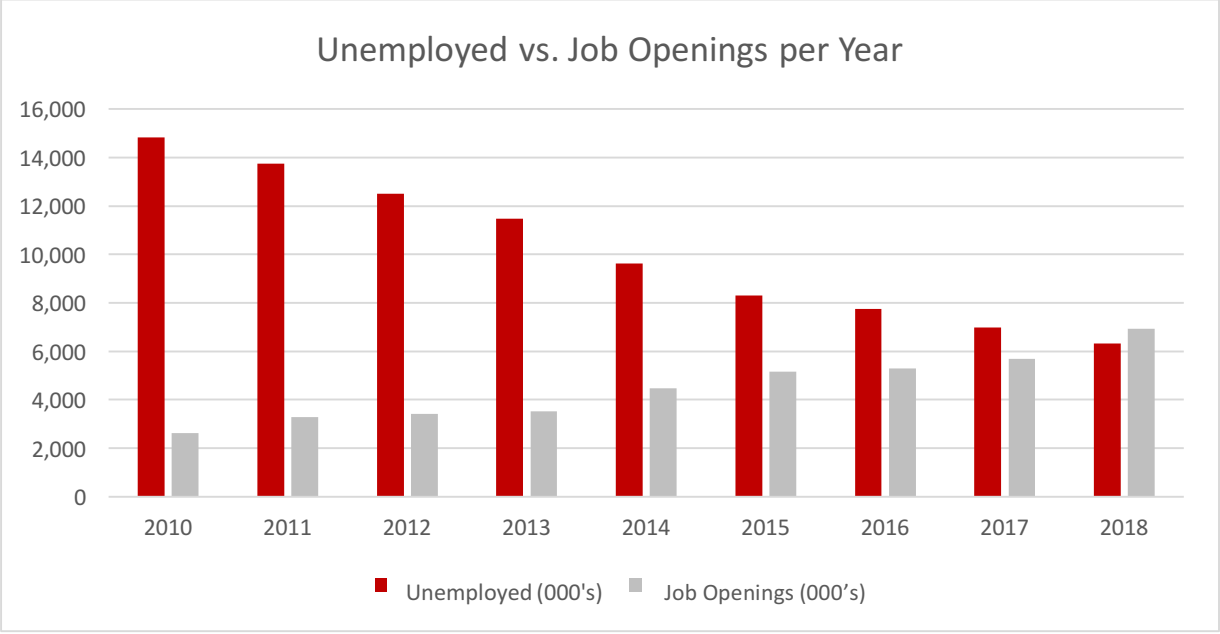

Figure 3: Data from the United States Department of Labor, Bureau of Labor Statistics. Bureau of Labor Statistics (2018) Current Population Survey. Retrieved from https://www.bls.gov/cps/tables.htm

The growing skills gap

The skills gap is a pressing concern, with millions of unfilled positions and an increasingly tight labor market. However, these openings also represent an important opportunity. Equipping workers with the skills to secure well-paying jobs can address labor shortages, reinforce the middle class, and drive economic growth.

Companies struggle to fill positions

The United States is experiencing a historic labor shortage due to the mismatch between the skills employers need and the skills workers have. In June 2018, the number of U.S. job openings reached 6.7 million, outstripping the number of unemployed Americans for the first time since record-keeping began in 2000.[37]

The shortage is particularly acute for middle-skill jobs. According to the National Skills Coalition, middle-skill jobs – which require skills typically attained by those with more than a high school education, but less than a four-year degree – account for 53% of the U.S. labor market, but only 43% of American workers are appropriately trained for these positions.[38] These careers can provide a gateway to the middle class and support widespread prosperity, but only if workers have the needed capabilities.

Looking ahead, the skills gap is projected to grow. Through 2024, it's estimated that there will be 16 million openings for middle-skills jobs that require more training and education than a high-school diploma, but less than a bachelor's degree.[39] On our current course, the resulting skills gap could soon be a drag on the overall economy.

Missing: Both human and tech skills

Though discussions of the skills gap often focus on technology, employers are struggling to find both tech skills and human skills. Consider that the industries with the most severe labor shortages are those that require cognitive and social skills. Together, leisure and hospitality, education and health services, and professional and business services have 3.3 million open positions – more than half of current private-sector job openings.[40]

This is part of a long-term and ongoing evolution. From 1980 to 2015, U.S. employment in jobs requiring average or above-average social skills grew by 83%, and 77% for jobs requiring higher level analytical skills.[41] And demand will continue to grow: more than half of business leaders predict future demand for social skills, cognitive abilities, and complex problem-solving.[42]

Of course, the technology skills shortage is also a central problem: the demand for tech skills is expected to increase 55% by 2030.[43] And in a survey of U.S. senior executives, 77% said that addressing the potential skills gap related to automation and digitization was a top 10 priority.[44]

Powering economic growth and lifting families into the middle class will require that the United States address the skills gap. Workers need help adapting to and benefiting from globalization and technological progress, including the implications for social and cognitive skills.

The need for continuous learning

The rapid pace of technological change is shortening the half-life of skills, requiring workers to constantly seek development and training opportunities. Building a successful career now requires continuous learning: acquiring new skills, experiences, and education at every stage of life.

The rise of reskilling

As technological change and global competition accelerate, workers are finding that they need to constantly refresh their skills. The "half-life" of a job skill is now estimated at five years, after which the skill is worth just half its initial value.[45] Looking ahead, the World Economic Forum estimates that over one-third of the in-demand skill sets for most occupations will be different in 2020 from those that were in-demand in 2015.[46]

In particular, workers must increasingly acquire cross-disciplinary skills and experiences. For example, the most in-demand skill for IT help-desk technicians is not greater IT knowledge, but higher-level writing.[47] Or consider the same dynamic, in reverse: liberal arts graduates who supplement their degree with technical skills, such as graphic design or data analysis, see an average $6,000 increase in their salaries.[48]

Due to these trends, some experts point to the emergence of a "third wave" in education and training, building on the previous waves of high school education in the early 1900s and college education in latter half of the 20th century. This shift "is likely to be marked by continual training throughout a person's lifetime—to keep current in a career, to learn how to complement rising levels of automation, and to gain skills for new work."[49]

Workers and business leaders prioritize learning

Both workers and CEOs are recognizing and responding to this shift. However, there is still a need for efforts to help all workers navigate the disruption and embrace lifelong learning.

Workers are aware that skills demands are increasing. Fully 87% of employed Americans say it will be important or essential for them to "get training and develop new skills throughout their work life to keep up with changes in the workplace." 45% of employed adults pursue training to improve their skills, yet 35% of workers say that they don't have the education and training to advance at their current job.[50]

Continuous learning is also a priority in the C-suite. Nearly four-in-ten CEOs in the U.S. are implementing continuous learning initiatives to reduce turnover and provide development pathways.[51] In particular, business leaders see continuous learning as a response to automation. 66% of U.S. senior executives say retraining is one of the primary solutions to fill skills gaps related to automation and digitization.[52]

In the constantly changing world of work, learning must be continuous, cross-functional, and embraced by both employees and employers. This is the only way to achieve the flexibility needed for dynamic careers today and in the future.

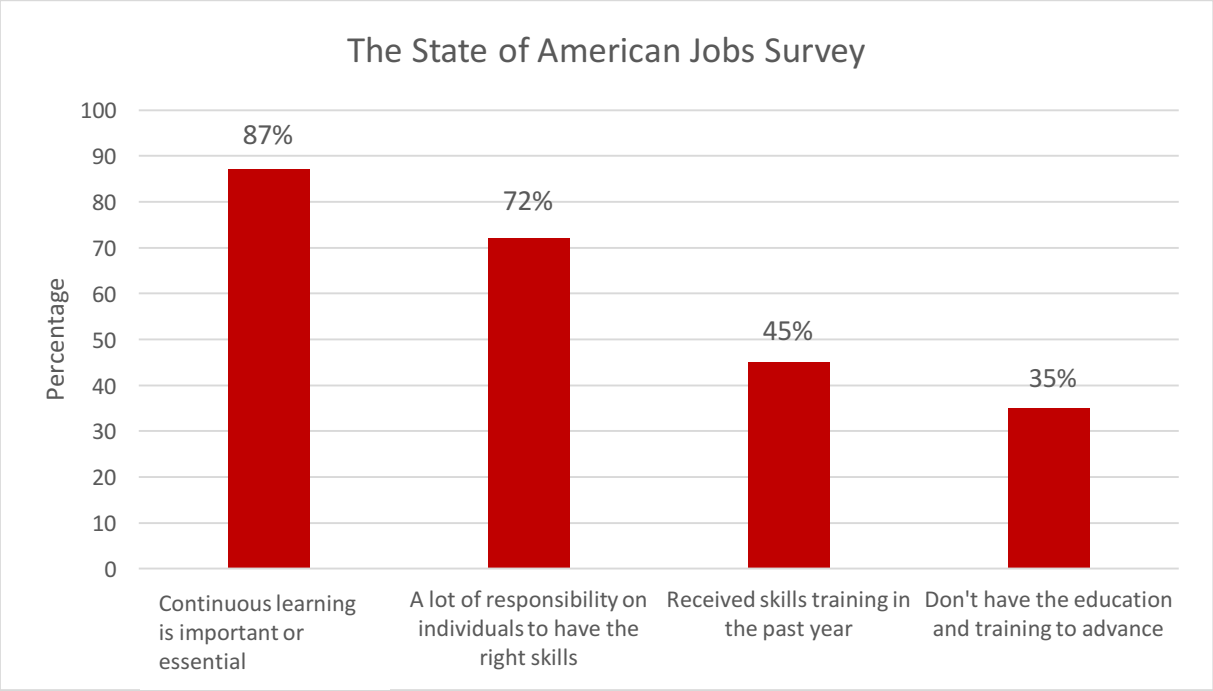

Figure 4: Data from "The State of American Jobs: How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead," Pew Research Center, p. 63-64, October 6, 2016.

Economic and social costs

Without action to address these macrotrends, the United States faces a significant threat of declining economic mobility, mounting financial challenges, growing geographic disparities, and other negative impacts. The imperative is clear: seize opportunities to build a 21st-century workforce – or face widespread social and economic costs.

Concerning trends

Despite the strength of the economy overall, a variety of indicators show that Americans are struggling. The share of the population considered middle class has declined from above 60% in 1971 to just 50% in 2015.[53] The median household income has only slightly increased in the past 15 years, and wage growth remains slow.[54] And although unemployment is low, the labor force participation rate has fallen from 66% in 2008 to below 63% in 2018.[55]

Economic mobility has also been steadily declining, which threatens to limit the prospects of young Americans. In the 1970s, 90% of young workers earned more than their parents at the same age; now, just 50% do.[56] Further, roughly 70% of Americans say that "today's young adults face more economic challenges than their elders did when they were first starting out."[57]

These economic hurdles are more severe in certain areas of the country, especially those that once relied on manufacturing. From 2010 to 2016, half of the country's employment growth occurred in just 20 major metropolitan areas, while many smaller cities and non-metro areas saw no employment increase or even a decline.[58]

The road ahead

The United States still has time to reverse these trends – equipping workers to acquire in-demand skills, secure jobs in the modern economy, and build lasting careers. The ingredients are already here. The majority of workers recognize that long-term success will require regular reskilling and training, and many are already upgrading their skills.[59] A record one-third of Americans have a bachelor's degree or higher.[60] A bright and economically vibrant future is in reach, if the country can find solutions that tap into its immense human potential.

However, inaction threatens to exacerbate existing challenges, leaving millions of Americans unprepared for the future of work. If this occurs, the country may struggle to compete in the global economy, with declining middle-class employment and widening social and economic gaps.

The time to act is now. Key stakeholders must implement well-designed, innovative, and forward-looking solutions that revamp the U.S. workforce for the demands and opportunities ahead. Across sectors, American leaders and institutions must launch responses that match the unprecedented scale and speed of change in today's world.

Responses:

Three Focus Areas for Policy-makers, Businesses, and the Institute

How should the United States respond?

The Institute believes that a future-oriented lens is essential for this question. Too much research and news coverage present automation, globalization, and demographic change as entirely negative and impossible to solve. Headlines declare that millions of positions will be automated, that jobs are being moved permanently off-shore, and that population aging will undo the U.S. labor force. While these stories and studies identify important trends, they can sometimes miss the most important point: the imperative for action.

Despite the challenges, the shifting economy presents vital opportunities for workers to adapt and thrive. However, many existing programs and policies are not fully aligned with this new landscape. This creates an urgent need for convening and collaboration between the private and public sectors to update, redesign, and launch effective efforts that focus on the potential that is now available.

These efforts must identify and strengthen the pathways to new, 21st-century jobs and make these pathways visible and accessible for workers across the country. Amid rapid change, our country's response should not be to roll back high-level economic forces, but to re-orient the workforce for the valuable, long-term opportunities that are being created.

In this section, we lay out questions to guide research, conversations, and content curation in three areas: reimagining the education system, realigning the corporation, and reframing public policy.

1. Reimagining the Education System

Our country's approach to education is aligned with the skills needs of 100 years ago. We must rethink the way education is delivered – at every level – to equip students to enter dynamic industries, fill the skills gap, and build successful careers.

There are significant opportunities to improve current levels of job readiness among American students. For example, a recent Gallup survey finds that just 34% of students at four-year colleges believe they will graduate with the skills and knowledge to be successful in the job market.[61]

Unfortunately, employers agree: more than half say that recent graduates lack critical thinking skills and attention to detail.[62]

However, the challenge is larger than just colleges. American high school students finished 35th in math, 25th in science, and 24th in reading compared to their peers in other countries on a frequently cited international exam.[63] And the United States also lags behind other advanced economies in the use of technical education programs, such as apprenticeships and vocational school.

The Institute explores key questions such as:

- **How can prekindergarten programs lay the foundation for lifelong success?**
  High-quality prekindergarten (PreK) programs have been found to close the achievement gap, boost high school graduation rates, and generate as much as 7x ROI.[64] Yet many families lack access to PreK, and some programs have struggled to produce results.[65] How can school districts and communities improve and scale PreK programs to realize their potential?

- **What is the best way to incorporate STEM at all levels of our education system?**
  Just 21% of high school students who take the ACT meet its benchmark for STEM skills,[66] and, in college, STEM majors account for less than 20% of all graduates.[67] What responses can attract students to STEM and promote these vitally important skills?

- **What should the university of tomorrow look like?**
  The number of students attending college has reached record highs, but there are unanswered questions about how colleges should adapt for the 21st century. In particular, the number of older adults and the need for continuous education are both growing at rapid rates. How can we transform colleges to support continuous education and reskilling throughout individuals' lives, aligning with the opportunities and needs of the new economic environment?

- **What role can community colleges play in speeding skills development?**
  While 42% of undergraduate students are enrolled in community colleges,[68] less than 40% of these students graduate in six years or less.[69] What can be done to support community colleges as centers for skills development and gateways to well-paying jobs?

- **How can apprenticeship programs qualify workers for new job opportunities?**
  The number of apprenticeships in the United States has climbed more than 40% in recent years, reaching more than 530,000.[70] Still, fewer than 5% of young Americans train as apprentices, compared to almost 60% in Germany.[71] How can these opportunities be expanded?

2. Realigning the Corporation

To stay competitive, businesses must now operate differently than in the past. Dramatic changes in the external environment require that companies shift their approaches to learning and development, organizational design, job functions, and career paths.

While businesses are investing and experimenting in these areas, there is not yet consensus on the most effective approaches to equip workers with the needed skills and experiences. U.S. companies spent a total of more than $90 billion on staff training in 2017; one-third more than in 2016.[72] Yet the skills gap persists, particularly for jobs that are being transformed by automation and globalization.

Business leaders believe that the private sector will play an essential role in navigating this challenge. In fact, 64% of American senior executives said that corporations should "take the lead" to address skills gap related to automation and digitization.[73] However, 42% of executives

in the same study acknowledged that they don't have a good understanding of how automation will affect their organization's future skills needs.[74]

The Institute believes that businesses can develop the innovative learning programs, career paths, and tech tools needed to lift workers and drive growth, exploring opportunities around questions such as:

- **How can companies support effective on-demand training and continuous learning?** More than half of business leaders say that their company doesn't have the necessary programs in place to build the skills of the future.[75] How can companies address this need to develop the right skills and encourage continuous learning?
- **How do companies reorganize themselves to facilitate skills development and modern careers?** Providing opportunities for employees to gain new experiences and develop new skills, particularly across functions and expertise areas, is critical for the future of the American workforce. How can companies implement changes to organizational design and job roles to enable this kind of learning?
- **How can technology be used in collaboration with humans to make work more meaningful and rewarding?** More than half of business leaders say they are "actively redesigning jobs around artificial intelligence (AI), robotics, and new business models."[76] How can these changes tap employees' potential and benefit both workers and businesses?

3. Reframing Public Policy

Preparing Americans for the future of work is a central goal for policy-makers at every level of government and across party lines, as well as for companies in the private sector. This creates a valuable opportunity for public-private partnerships that identify and scale the best workforce policy solutions, ensuring that policy efforts are closely attuned to the realities of today's economy. The private sector can provide critical guidance and support to achieve this goal.

For decades, policy-makers have enacted a variety of efforts to assist, train, and reskill American workers and students. The federal government spends more than $110 billion on education and workforce development each year, funding a wide set of programs, initiatives, and grants.[77] State governments also target education and work readiness; for example, more state-level bills on career and technical education were passed in 2017 and 2018 than any other area of education policy.[78]

These diverse efforts have achieved mixed results, providing both successful models and pitfalls to avoid. Some types of job training programs, such as industry partnerships and registered apprenticeships, have been found to lift participants' employment prospects and earnings.[79] Certain educational initiatives have also achieved success, such as the Head Start PreK program, which increases the probability of high school and college graduation.[80]

However, there have also been noteworthy struggles. Some studies have questioned the efficacy of federal job training programs, finding that they do not result in higher earnings or employment.[81] Funding has also been uneven. Federal funding for key jobs programs, such as the Workforce Innovation and Opportunity Act, has fallen by as much as 40% since 2001.[82] And nearly 30 states still have not returned education funding to the same levels as before the global financial crisis.[83]

The Institute explores and identifies best-in-class, cross-sector solutions that optimize outcomes for workers, taxpayers, and businesses. In particular, we believe that public-private partnerships can be an important tool to develop such solutions and address several key questions:

- **How can education policy at the federal, state, and local levels support job readiness?** As described in the previous section, education often plays a decisive role in whether Americans are prepared to find and succeed in jobs after graduation. However, education policy is not always aligned with the most up-to-date perspectives and opportunities in the private sector. How can the public and private sectors partner to ensure that education policy maximizes job readiness?

- **How can tax policy encourage companies to offer the training and development opportunities that workers need?** Experts have proposed tax incentives for worker training as a way to promote employer investment in the workforce.[84] How can tax policy be designed to encourage private-sector job training that benefits both employees and businesses?

- **What job programs are working best, and how can they be scaled?** Research has found that the most successful job training programs directly engage private-sector partners to ensure that courses are aligned with existing skills needs among employers.[85] How can policy-makers and companies build public-private partnerships to guide successful job training efforts?

We believe that by pursuing case-based research, bringing together expert viewpoints, curating compelling content, spotlighting promising projects, and piloting new programs that are addressing these fundamental questions, the Institute can help provide workers, the private sector, government, and other stakeholders a roadmap for productive responses to the ongoing shifts in the economy and workforce.

Endnotes

1 U.S. Bureau of Labor Statistics, "All Employees: Manufacturing," Federal Reserve Bank of St. Louis, September 7, 2018, accessed September 12, 2018.

2 U.S. Bureau of Labor Statistics, "Occupational Outlook Handbook: Production Occupations," United States Department of Labor, April 13, 2018, accessed September 12, 2018.

3 "The State of American Jobs: How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead," Pew Research Center, p. 13, October 6, 2016, accessed September 12, 2018.

4 "The State of American Jobs: How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead," Pew Research Center, p. 5, October 6, 2016, accessed January 28, 2019.

5 "The Future of Jobs Report 2018," World Economic Forum, 2018, accessed January 28, 2019.

6 Eric Morath, "American Job Openings Now Outnumber the Jobless," The Wall Street Journal, June 5, 2018, accessed September 12, 2018.

7 "United States' Forgotten Middle," National Skills Coalition, 2017, accessed January 28, 2019.

8 "2018 Talent Shortage Survey: United States," Manpower Group, 2018, accessed September 12, 2018.

9 "America's Divided Recovery," Georgetown University Center on Education and the Workforce, June 30, 2016, accessed January 28, 2019.

10 Alan Berube and Cecile Murray, "Renewing America's economic promise through older industrial cities," The Brookings Institution, April, 2018, accessed September 12, 2018

11 Ben Casselman, "A Peek at Future

12 Michael J. Hicks and Srikant Devaraj, "The Myth and the Reality of Manufacturing in America," Center for Business and Economic Research - Ball State University, p. 6, April, 2017, accessed September 12, 2018.

13 McKinsey Global Institute, "Jobs Lost, Jobs Gained: Workforce Transitions In A Time Of Automation," McKinsey&Company, December, 2017, accessed September 12, 2018; "The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution," World Economic Forum, January 2016, accessed September 12, 2018.

14 McKinsey Global Institute, "Jobs Lost, Jobs Gained: Workforce Transitions In A Time Of Automation," McKinsey&Company, p. 102, December, 2017, accessed September 12, 2018.

15 McKinsey Global Institute, "Jobs Lost, Jobs Gained: Workforce Transitions In A Time Of Automation," McKinsey&Company, p. 102, December, 2017, accessed September 12, 2018.

16 McKinsey Global Institute, "Jobs Lost, Jobs Gained: Workforce Transitions In A Time Of Automation," McKinsey&Company, p. 8, December, 2017, accessed September 12, 2018.

17 Dimple Agarwal, Josh Bersin, Gaurav Lahiri, Jeff Schwartz, and Erica Volini, "AI, robotics, and automation: Put humans in the loop," Deloitte Insights, March 28, 2018, accessed September 12, 2018.

18 William Wilkes, "How the World's Biggest Companies Are Fine-Tuning the Robot Revolution," Wall Street Journal, May 14, 2018, accessed September 12, 2018.

19 Sara Castellanos, "Farmers Insurance Tests AI, Automation's Potential For Speeding Up Claims Process," Wall Street Journal, June 28, 2018, accessed September 12, 2018; Hugh Son, "Morgan Stanley's 16,000 Human Brokers Get Algorithmic Makeover," Bloomberg, May 31, 2017, accessed September 12, 2018.

20 Nora Walsh, "The Next Time You Order Room Service, It May Come by Robot," New York Times, January 29, 2018, accessed September 12, 2018.

21 McKinsey Global Institute, "Jobs Lost, Jobs Gained: Workforce Transitions In A Time Of Automation," McKinsey&Company, p. 34, December, 2017, accessed September 12, 2018.

22 David H. Autor, David Dorn, and Gordon H. Hanson, "The China Stock: learning from Labor-Market Adjustment to Large Changes in Trade," Annual Review of Economics, p. 227, August 8, 2016, accessed September 12, 2018.

23 Bruce Stokes, "Americans have dim view of trade's impact on jobs and wages," Pew Research Center, September 17, 2014, accessed September 12, 2018.

24 Bruce Stokes, "Americans have dim view of trade's impact on jobs and wages," Pew Research Center, September 17, 2014, accessed September 12, 2018.

25 "U.S. Trade in Goods and Services – Balance of Payments (BOP) Basis," United States Census Bureau, June 6,2018, accessed September 12, 2018.

26 "U.S. Exports of Services by Major Category," United States Census Bureau, 2018, accessed September 21, 2018.

27 Kristen Bialik, "Number of U.S. workers employed by foreign-owned companies is on the rise," Pew Research Center, December 14, 2017, accessed September 12, 2018.

28 Kristen Bialik, "Number of U.S. workers employed by foreign-owned companies is on the rise," Pew Research Center, December 14, 2017, accessed September 12, 2018.

29 U.S. Bureau of Labor Statistics, "Labor Force Projections to 2024: the labor force is growing, but slowly," United States Department of Labor, December, 2015, accessed September 12, 2018.

30 "2017 RCS Fact Sheet #2: Expectations About Retirement," Employee Benefit Research Institute and Greenwald & Associates, 2017, accessed September 12, 2018.

31 Catherine Collinson, "Baby Boomer Workers are Revolutionizing Retirement: Are They and Their Employers Ready?" Transamerica Center for Retirement Studies, December, 2014, accessed September 12, 2018.

32 Claudia Dreifus, "In a Tight Labor Market, Retirees Fill Gaps Their Previous Employers Can't," New York Times, July 13, 2018, accessed September 12, 2018; Shelley Emling, "Working at 50+," AARP, April 4, 2018, accessed September 12, 2018.

33 Richard Fry, "Millennials are the largest generation in the U.S. labor force," Pew Research Center, April 11, 2018, accessed September 12, 2018.

34 "Better Quality of Work Life is Worth a $7,600 Pay Cut for Millennials," Business Wire, April 07, 2016, accessed September 12, 2018.

35 Brandon Rigoni and Amy Adkins, "What Millennials Want from a New Job," Harvard Business Review, May 11, 2016, accessed September 12, 2018.

36 "2018 Deloitte Millennial Survey," Deloitte, p. 22-23, 2018, accessed September 12, 2018.

37 Eric Morath, "American Job Openings Now Outnumber the Jobless," The Wall Street Journal, June 5, 2018, accessed September 12, 2018.

38 "United States' Forgotten Middle," National Skills Coalition, 2017, accessed September 12, 2018.

39 Jeffrey Selingo, "The False Promises of Worker Retraining," The Atlantic, January 8, 2018, accessed September 12, 2018.

40 U.S. Bureau of Labor Statistics, "Job Openings and Labor Turnover – July 2018," United States Department of Labor, p. 3, September 11, 2018, accessed September 12, 2018.

41 "Changes in the American workplace," Pew Research Center, October 6, 2018, accessed September 12, 2018.

42 Dimple Agarwal, Josh Bersin, Gaurav Lahiri, Jeff Schwartz, and Erica Volini, "AI, robotics, and automation: Put humans in the loop," Deloitte Insights, March 28, 2018, accessed September 12, 2018

43 Jacques Bughin, Susan Lund, and Eric Hazan, "Automation Will Make Lifelong Learning a Necessary Part of Work," Harvard Business Review, May 24, 2018, accessed September 12, 2018.

44 Pablo Illanes, Susan Lund, Mona Mourshed, Scott Rutherfod, and Magnus Tyreman, "Retraining and reskilling workers in the age of automation," McKinsey Global Institute, January 2018, accessed September 12, 2018.

45 Stephane Kasriel, "Skill, re-skill and re-skill again. How to keep up with the future of work," World Economic Forum, July 31, 2017, accessed September 12, 2018.

46 "The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution," World Economic Forum, p.20, January 2016, accessed September 12, 2018.

47 Andrew Weaver, "The Myth of the Skills Gap," MIT Technology Review, August 25, 2017, accessed September 12, 2018.

48 "The Art of Employment: How Liberal Arts Graduates Can Improve Their Labor Market Prospects," BurningGlass, August, 2013, accessed September 12, 2018.

49 Jeffrey Selingo, "The Third Education Revolution," The Atlantic, March 22, 2018, accessed September 12, 2018.

50 "The State of American Jobs: How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead," Pew Research Center, p. 63-64, October 6, 2016, accessed September 12, 2018.

51 "US business leadership in the world in 2018," PwC, p. 7, January, 2018, accessed September 12, 2018.

52 Pablo Illanes, Susan Lund, Mona Mourshed, Scott Rutherfod, and Magnus Tyreman, "Retraining and reskilling workers in the age of automation," McKinsey Global Institute, January 2018, accessed September 12, 2018.

53 "The American Middle Class Is Losing Ground," Pew Research Center, December 9, 2015, accessed September 12, 2018.

54 U.S. Census Bureau, "Real Median Household Income in the United States," Federal Reserve Bank of St. Louis, September 13, 2017, accessed September 12, 2018; U.S. Census Bureau, "Real Median Household Income in the United States," Federal Reserve Bank of St. Louis, September 13, 2017, accessed September 12, 2018.

55 U.S. Bureau of Labor Statistics, "Labor Force Statistics from the Current Population Survey," United States Department of Labor, September 12, 2018, accessed September 12, 2018.

56 Raj Chetty, David Grusky, Maximilian Hell, Nathaniel Hendren, Robert Manduca, and jimmy Narang, "The Fading American Dream: Trends In Absolute Income Mobility Since 1940," National Bureau of Economic Research, p.1, December, 2016, accessed September 12, 2018.

57 "Millennials in Adulthood: Detached from Institutions, Networked with Friends," Pew Research Center, March 7, 2014, accessed September 12, 2018.

58 Mark Muro and Jacob Whiton, "Geographic gaps are widening while U.S. economic growth increases," Brookings Institution, January 23, 2018, accessed September 12, 2018.

59 The State of American Jobs: How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead," Pew Research Center, p. 63-64, October 6, 2016, accessed September 12, 2018.

60 Reid Wilson, "Census: More Americans have college degrees than ever before," The Hill, April 3, 2017, accessed September 12, 2018.

61 "Strada-Gallup 2017 College Student Survey: Crisis of Confidence," Gallup, 2017, accessed September 12, 2018.

62 Jonathan Berr, "Employers: New college grads aren't ready for the workplace," CBS MoneyWatch, May 17, 2016, accessed September 12, 2018.

63 "Building America's Future: STEM Education Intervention Is A Win-Win," Penn Wharton University of Pennsylvania, November 1, 2017, accessed September 12, 2018.

64 David L. Kirp, "Does Pre-K Make Any Difference?" New York Times, October 3, 2015, accessed September 12,2018.

65 David L. Kirp, "Does Pre-K Make Any Difference?" New York Times, October 3, 2015, accessed September 12, 2018.

66 "STEM Education in the U.S.: Where We Are and What We Can Do," ACT, p.3, 2017, accessed September 12, 2018.

67 Anthony P. Carnevale, Nicole Smith, Michelle Melton, "STEM," Georgetown University Center on Education and the Workforce, p. 42, 2014, accessed September 12, 2018.

68 Jennifer Ma, Sandy Baum, "Trends in Community Colleges: Enrollment, Prices, Student Debt, and Completion," College Board Research, p. 1, April, 2016, accessed September 12, 2018.

69 Dough Shapiro, Afet Dundar, Xin Yuan, Autumn T. Harrell, Phoebe Khasiala Wakhungu, "Completing College: A National View of Student Attainment Rates – Fall 2008 Cohort," National Student Clearinghouse Research Center, p. 5, November 2014, accessed September 12, 2018.

70 Employment and Training Administration, "Registered Apprenticeship National Results Fiscal Year (FY) 2017," United States Department of Labor, April 4, 2018, accessed September 12, 2018.

71 Tamar Jacoby, "Why Germany Is So Much Better at Training Its Workers," The Atlantic, October 16, 2014, accessed September 12, 2018.

72 Bartleby, "More staff training is vital," The Economist, August 9, 2018, accessed September 12, 2018.

73 Pablo Illanes, Susan Lund, Mona Mourshed, Scott Rutherfod, and Magnus Tyreman, "Retraining and reskilling workers in the age of automation," McKinsey Global Institute, January 2018, accessed September 12, 2018.

74 Pablo Illanes, Susan Lund, Mona Mourshed, Scott Rutherfod, and Magnus Tyreman, "Retraining and reskilling workers in the age of automation," McKinsey Global Institute, January 2018, accessed September 12, 2018.

75 Dimple Agarwal, Josh Bersin, Gaurav Lahiri, Jeff Schwartz, Erica Volini, "From careers to experiences: New pathways," Deloitte Insights, March 28, 2018, accessed September 12, 2018.

76 Dimple Agarwal, Josh Bersin, Gaurav Lahiri, Jeff Schwartz, Erica Volini, "From careers to experiences: New pathways," Deloitte Insights, March 28, 2018, accessed September 12, 2018

77 Paul Fain, "Better Marriage Between College and Job Training," Inside Higher Ed, March 22, 2017, accessed September 12, 2018.

78 "State Education Policy Tracking," Education Commission of the States, February 17, 2017, accessed September 12, 2018.

79 "What Works In Job Training: A Synthesis of the Evidence," U.S. Department of Labor, U.S. Department of Commerce, U.S. Department of Education, U.S. Department of Health and Human Services, July 22, 2014, accessed September 12, 2018.

80 Deborah Whitmore Schanzenbach and Lauren Bauer, "The long-term impact of the Head Start program," Brookings Institution, August 19, 2016, accessed September 12, 2018.

81 Jeffrey Selingo, "The False Promises of Worker Retraining," The Atlantic, January 8, 2018, accessed September 12, 2018.

82 "America's workforce: We can't compete if we cut," National Skills Coalition, accessed September 12, 2018.

83 Michael Leachman, Kathleen Masterson, and Eric Figueroa, "A Punishing Decade for School Funding," Center on Budge and Policy Priorities, November 29, 2017, accessed September 12, 2018.

84 Alastair Fitzpayne and Ethan Pollack, "Worker Training Tax Credit: Promoting Employer Investments in the Workforce," The Aspen Institute, May 12, 2017, accessed September 12, 2018.

85 Michael Greenstone and Adam Looney, "Building America's Job Skills with Effective Workforce Programs: A Training Strategy to Raise Wages and Increase Work Opportunities," Brookings Institution, November 30, 2011, accessed September 12, 2018.