



# Bridging the Skills Gap

Workforce Development  
Is Everyone's Business<sup>®</sup>



# BRIDGING THE SKILLS GAP

WORKFORCE DEVELOPMENT  
IS EVERYONE'S BUSINESS®



© 2015 by ASTD DBA The Association for Talent Development.  
All rights reserved.

No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the publisher, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law. For permission requests, write to ATD Public Policy, 1640 King Street, Alexandria, VA 22314.

#### **ORDERING INFORMATION**

Research reports published by ATD can be purchased by visiting ATD's website at [store.astd.org](http://store.astd.org) or by calling 800.628.2783 or 703.683.8100.

**ATD Product Code:** 791512-WP

**ISBN-10:** 1-60728-136-8

**ISBN-13:** 978-1-60728-136-8

**e-ISBN:** 978-1-60728-135-1

**Publication Date:** October 2015

#### **ATD EDITORIAL STAFF**

**Director:** Kristine Luecker

**Manager:** Christian Green

**Cover and Interior Design:** Tony Julien

**Production Manager:** Dara Friel

# CONTENTS

---

Welcome	02
ATD Public Policy Council	03
Introduction	04
What Contributes to the Skills Gap?	06
The Impact of the Skills Gap	11
The Path Forward: Bridging the Skills Gap	16
Action Plan	24
A Vision for the Workforce	26
Case Studies	27
Methodology	34
References	36

# WELCOME

---

## **Talent development professionals, business leaders, managers, and educators,**

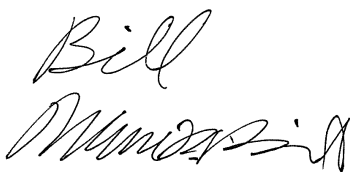
There is ample evidence that across the United States there are jobs not being filled. Yet, we have an adequate supply of new entrants into the workforce as well as existing workers looking for new jobs who do not have the requisite skills for these openings. It is hard to imagine a more important workforce development issue affecting society than “closing the skills gap.” Thank you for reaching out for information on this topic and examining the research in this ATD whitepaper. I hope that you find it informative and useful in your efforts to identify and address any skills gap with which your organization may be dealing.

The new ATD research in this whitepaper and the corroborating research cited attempt to help today’s talent development professionals succeed in their critical roles by illustrating where critical gaps are and providing a road map for how you can add value to organizations and help them close those gaps. You will hear from practitioners who share the challenges they face in their organizations and the insights they are gaining as they work to close skills gaps. The perspectives offered point to the need for greater partnerships among business, educational institutions, the public workforce system, and government agencies to determine the critical skills gaps in specific regions or industries, and develop steps to close those gaps.

As with any worthwhile endeavor, this whitepaper was the product of a broad group of workforce development professionals brought together by ATD and its public policy council. I have the privilege of serving as the current chair of this council. It was their hard work, with assistance from ATD staff members, that produced this report. I greatly appreciate the team’s work.

Our hope is that this whitepaper is a useful resource for you. Thank you for diving into this important topic and please share any comments or insights you have. We can be contacted at [publicpolicy@td.org](mailto:publicpolicy@td.org).

Best of luck in your workforce journey,



**Bill Docalovich**

Chair, ATD Public Policy Council

# ATD PUBLIC POLICY COUNCIL

---

## **2015 Chair**

### **Bill Docalovich**

Director, Trades Services  
Huntington Ingalls Industries—Newport  
News Shipbuilding

### **Jacqueline (Jacque) Burandt**

Senior Director, Center for Learning  
Excellence  
University Health System

### **Dana Alan Koch**

Learning Strategist  
Accenture

### **Cristina Masucci, CPLP**

Senior Training Specialist  
Delaware North Companies

### **Nadine Rothermel**

Director, Management Development  
Keysight Technologies

### **Norm Seavers**

Associate Vice President  
Institute for Economic Development  
Broward College

### **Sal Venegas**

Senior Director, Learning and  
Talent Management  
Walgreens

## *Public Policy Advisor*

### **C. Michael Ferraro**

President and CEO  
TRAINING SOLUTIONS, Inc.

## *ATD Staff Liaison*

### **Kristen Fyfe-Mills**

Senior Manager, Communications  
Association for Talent Development

The council is grateful to Patty Gaul, writer and editor at ATD, for her assistance in writing this report, as well as Capella University, IBM, Newport News Shipbuilding, Shady Springs Bank, University Health System, and Valspar for their case study contributions.

# INTRODUCTION

---

ATD defines a skills gap as a significant gap between an organization's current capabilities and the skills it needs to achieve its goals and meet customer demand. It is the point at which an organization may not be able to grow or remain competitive because it cannot fill critical jobs with employees who have the right knowledge, skills, and abilities.

"We have a significant skills gap in IT knowledge. . . . Our equipment is becoming more high tech and requires more than 'break/fix' skills. Skilling up a workforce with limited IT knowledge can be a major challenge."

This is just one comment from a respondent to the 2015 ATD Skills Gap Survey regarding the challenges that are contributing to the skills gap and how it is affecting their organizations. (Respondent quotes are called out throughout the whitepaper.) The 2015 ATD Skills Gap Survey was fielded in May 2015 and comprised a total of 17 questions. ATD received 786 responses of which 486 were analyzed. The input came from talent development professionals with titles of manager and above, who serve in organizations of various sizes and industries.



We have turned down or not even pursued certain projects because we do not have the qualified people to lead the projects."

This is the fifth whitepaper researched and written by the Association for Talent Development (formerly the American Society for Training & Development) about bridging the skills gap; the first whitepaper was published in 2003, and the most recent in 2012. This whitepaper discusses the changing nature of work and reasons behind the skills gap, and provides recommendations for talent development professionals on steps they can take to identify and close skills gaps in their organizations.

The skills gap in the United States and globally has gained significant attention during recent years. A range of studies from nonprofits and businesses cite the skills gap, and while science, technology, engineering, and math (STEM) are certainly part of the challenge—reflected by a recent post on eWeek titled "IT Skills Gap Negatively Impacting Businesses"—it is by no means the only challenge. The middle-skills gap—those jobs that require more than a high school degree but less than a four-year college degree—is being talked about more and more. For example, recent articles titled "Working Here: Middle-Skills Gap Widens" and "Where Are All the Middle-Skill Workers?" further bear this out (Louden 2015; Weber 2014).



Around the United States, JPMorgan Chase has conducted studies analyzing the skills gap in urban areas including Cleveland, Chicago, and Los Angeles. But the skills gap extends beyond America's borders. A recent study found that three-quarters of 1,322 CEOs in 77 countries say the skills shortage is the biggest threat to their business. A recent blog sums it up: "Employers Aren't Just Whining—the 'Skills Gap' Is Real" (PwC 2015; Bessen 2014).

In the United States, the concern about the skills gap has the attention of the executive branch of the government. In 2014, President Barack Obama authorized Vice President Joe Biden to spearhead a study on actions that could be taken to close the skills gap and help more people return to work. The results of that report were released when the president signed into law the Workforce Innovation and Opportunity Act, reauthorizing the 1998 Workforce Investment Act, which authorized the release of federal monies to be spent on workforce development (Biden 2014).

Communities, states, regions, and entire nations—now more than ever given the globalization of business—pay a heavy price when they cannot find or equip workers with the right skills for critical jobs. They fail to flourish and they also falter in meeting the demands of the customer.

In the ATD Study, 84 percent of respondents said there is currently a skills gap in their organization. Participants came from a broad spectrum of industries, including healthcare, finance, higher education, management consulting, manufacturing, and retail trade.

The results of the ATD Study are echoed elsewhere. A CareerBuilder study conducted in late 2014 indicated that 81 percent of respondents found it at least somewhat difficult to find candidates to fill jobs.



We will have a large number of employees retiring in the near future. Our main concern is the transfer of knowledge.”



Product development is lagging behind the latest technologies.”

# WHAT CONTRIBUTES TO THE SKILLS GAP?

---

Despite signs of economic recovery following the global economic downturn, the skills gap remains seemingly intractable. Why do we have such a significant skills gap in so many industries and across so many skill sets? Why aren't individuals learning the right skills for the high-demand jobs in their region?

The CareerBuilder study asked about contributors to the skills gap problem. Respondents said the skills gap is the result of education gaps in certain areas (55 percent), followed by gaps in on-the-job training (53 percent), new or shifting technologies (48 percent), and outsourcing of jobs to other countries (48 percent).

Some respondents to the ATD Study offered other reasons that the skills gap exists, such as not enough emphasis on training, organizations don't spend enough time looking for the best candidates for the job, and rapid market changes that require reskilling or upskilling. And the future does not look bright: In response to the question of what their organization was doing to close the skills gap, many respondents answered, "nothing."

There are many contributing factors to why and how the skills gap manifests. The changing nature of work, technology, and our knowledge economy have converged in a powerful way. Innovation, the pace of change, and the presence of multiple generations in the workforce are other significant contributors.



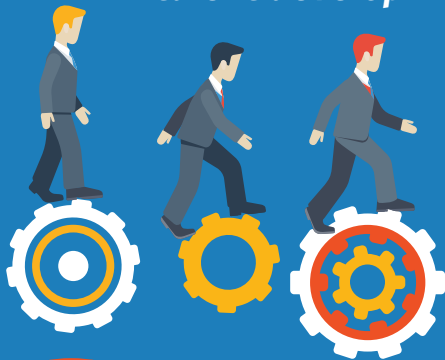
We are a highly specialized service-based technology company. Technology is constantly changing so we are frequently training our current employees and always looking for additional people who have the specialized skill sets that we need.”

# Why Does the Skills Gap Exist?

*According to the ATD Study,  
talent development professionals say:*

**56%**

Skills of the current workforce do not match changes in company strategy, goals, markets, or business models.



**48%**

When promoting internal candidates for certain types of jobs, there is a lack of requisite skills.



**43%**

Insufficient bench strength in the company's leadership ranks.

**45%**

When hiring for certain types of jobs, there are too few qualified candidates.



**43%**

Lack of skilled talent in one or more of the company's business lines.



**35%**

Respondents believe investments have been cut or senior leaders lack commitment to talent development.

## THE CHANGING NATURE OF WORK AND THE KNOWLEDGE ECONOMY

It is clear that the current work environment is not the same as what was experienced by previous generations. Whereas members of the Silent Generation and some older Baby Boomers often started and ended their careers not only in the same industry but also with the same employer, according to the U.S. Department of Labor, younger Baby Boomers—those born between 1957 and 1964—have held more than 11 jobs between the ages of 18 and 48.

During the economic downturn of 2008-2009, many manufacturing plants closed in the United States, which resulted in jobs being moved out of the country and roles being automated to eliminate or reduce the need for manpower. This resulted in a new kind of manufacturing being born in the United States, which required engineering and skilled trades capability. According to a 2015 Deloitte and The Manufacturing Institute study, “Creating a supply of workers with manufacturing skills—engineering, skilled trades, and production—will be critical to the future competitiveness of companies and the industry as a whole.”

A recent article asserting that a skills gap does exist explains this about the changing nature of work for a graphic designer: “Until recently, almost all graphic designers designed for print. . . . Then came smartphones and demand grew for mobile designers. . . . New specialties emerged such as user-interaction specialists and information architects. At the same time, business models in publishing have changed rapidly” (Weber 2014).

Our knowledge economy requires a greater percentage of workers to have STEM skills, especially in IT and math. From manufacturing to service industries, workers today are working with computers; for example, healthcare workers are very likely to make their rounds inputting data into laptops or other portable electronic devices.

According to a 2014 Business Roundtable and Change the Equation study, 97 percent of CEOs said that the U.S. STEM skills gap is an issue. Further, 28 percent said that at least half of their new entry-level hires lack basic STEM literacy, and 62 percent stated that they have a difficult time finding qualified applicants for jobs requiring advanced computer and information technology knowledge. This is critical for the United States as a whole, because over the next five years employers will need to hire nearly 1 million employees with basic STEM literacy and more than 600,000 employees with advanced STEM knowledge, according to the study.



The products we sell are changing quickly; it's hard to find engineers and product managers to support the development, as well as experienced sales and marketing people to be effective and efficient in selling the products.”

A Capital One/Burning Glass Technologies 2015 report echoed the importance of digital skills: “Effectively, entire segments of the U.S. economy are off-limits to people who don’t have basic digital skills. Even for middle-skill production jobs, such as machinists, eight in 10 job postings require these skills at some level.”

To meet the business needs of today and the future, individuals and their employers need to ensure that skills are continually being upgraded.

“Our organization needs to stay ahead of marketplace trends, keep pace on innovation, and better understand consumer needs.”

## Innovation and the Pace of Change

Why is it difficult to find candidates outside the organization or the bench strength within the company? Part of the reason can be tied directly to the rate of change that makes it a challenge for individuals and organizations to keep pace with the necessary skills to address today’s needs. In *Change Agents: The Role of Organizational Learning in Change Management*, 58 percent of those surveyed said that, when compared with the past five years, change is either much faster and increasingly unpredictable or extremely fast and impossible to predict (ATD 2014a).

The Business Performance Innovation (BPI) Network is an organization dedicated to identifying, exploring, and sharing emerging trends and transformational ideas and practices that are reshaping world markets and competitive landscapes. The organization’s 2015 study *Innovation: The New Competitive Equation* reports that, “In a world experiencing massive technology transformation and rapid shifts in customer markets and expectation, innovation has become a management imperative no business can afford to ignore.” It is a management imperative because it requires skilled talent in the right roles at the right time to keep companies competitive. This is reflected in the experiences of several respondents to the 2015 ATD Skills Gap Survey.

## A Changing Generational Workforce

Because Baby Boomers aren’t retiring as readily as expected, having multiple generations in the workforce may not currently have much of an impact on the skills gap; 51 percent of respondents to ATD’s Survey said it has a small or minimal impact. But it will in the future. As research from the University of North Carolina notes, currently 10,000 Baby Boomers turn 65 each day in the United States. And “62 percent of employers at Fortune 1000 companies believe that future retirements will result in skills labor shortages over the next five years” (Lindegren 2015).

There is concern that when Boomers do retire, a great deal of knowledge and skills will leave with them. What will happen to the organizational knowledge these employees possess? For many employers, when it comes to the skills gap, they are concerned that the knowledge has not been documented and transmitted to the incoming generation of employees, especially leaders. “One organization reported that the next anticipated wave of almost 700 retirements would mean the loss of over 27,000 years of experience” (Leonard, Swap, and Barton 2014).

How do you transfer knowledge and experience through the generations when communication and learning styles are notably different? It is imperative to recognize the differences across generations. In the ATD *Infoline* “Managing the Virtual Workforce” the author explains the following about each generation (Tedesco 2013):

“As the Baby Boomers retire, much of their intellectual capital will leave with them. What our new hires lack is understanding the culture, decision-making process, and history. The learning curves may be longer.”

Generation	Favorite Communication Tool	Biggest Challenge to Relationships
Veterans 1928-1945	Telephone	Adoption of new technology within remote or virtual work environments
Baby Boomers 1946-1964	Email	Think they know more than other generations
Generation X 1965-1979	Email, text	Don't have enough clout to influence change
Millennials 1980-1994	Social media	Can be too independent; don't want to use the expertise of others
Net 1995-Present	You probably haven't heard of it	Ability to articulate their vision

Creating collaborative environments that factor in generational preferences, strengths, and challenges will be paramount in preventing possible crippling effects of the Boomer brain drain.

# THE IMPACT OF THE SKILLS GAP

---

While recognizing key drivers behind the skills gap is important, it is also critical to understand what impact the skills gap is having and will have on organizations and countries. According to a report from Accenture, “without change, the shrinking workforce and unreliable productivity growth rate could lead to a 9 percent decline in the standard of living in the United States by 2030” (Accenture 2014).

A U.S. Chamber of Commerce Foundation report states that “U.S. employers are increasingly reporting problems finding qualified workers, despite stubbornly high unemployment rates. A recent survey found that 92 percent of executives believe there is a serious gap in workforce skills, and nearly 50 percent are struggling to fill jobs. In manufacturing alone, more than 75 percent of manufacturers report a moderate-to-severe shortage of skilled workers, and the problem is expected to grow. If left unaddressed, the skills gap could cause more than 5 million positions to go unfilled by 2020. This problem will be further compounded by an increase in retirements and a shrinking workforce” (Tyszko, Sheets, and Fuller 2014).

The ATD Study found of those respondents indicating that there was indeed a skills gap, 87 percent reported that the skills gap was affecting their performance, especially in customer service, growth, and service delivery.

Corroboration is also found in the Deloitte and The Manufacturing Institute study, which reported that the average U.S. manufacturer could lose as much as 11 percent of its annual earnings due to talent shortage. And there is an expected shortfall of 2 million workers over the next decade (Giffi et al. 2015).

## WHERE ARE THE BIGGEST GAPS?

According to the National Federation of Independent Business, an advocacy group for small business, “The proportion of business owners reporting that they can’t find qualified applicants has been trending steeply upward since the end of the recession.” Further, “the most commonly cited shortages are in technical trades such as welding and industrial machinery maintenance, as well as in supervisory and management positions” (Danaher 2014).

Directors at the McKinsey Global Institute explained: “Nearly two-thirds of companies report having positions for which they cannot find qualified applicants. The problem is especially acute in technology and healthcare” (Dobbs, Manyika, and Woetzel 2015).

The variety of industries that are affected by the skills gap is indeed broad—and global. For example, the Manpower Group 2015 Talent Shortage Survey reports that, internationally, the hardest jobs to fill are:

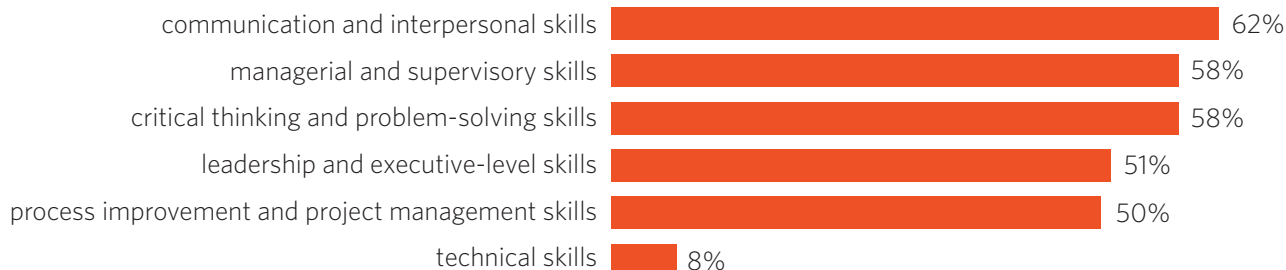
- skilled trade workers
- sales representatives
- engineers
- technicians
- drivers
- management and executives
- accounting and finance professionals.

The skills required for these jobs points to where the real work of closing the gap needs to happen. In addition to gaps in science, technology, engineering, and math that have already been addressed, business leaders say there are also gaps in communication and other soft skills.



The manufacturing group has trouble finding and keeping skilled welders and fitters. . . . We are cautious about the new projects we pursue, and struggle to keep the tenured employees we have.”

Indeed, the ATD Study found the following gaps:



## Middle-Skills Gap

Technological advancements have eliminated many low-skill jobs, which has caused such industries as manufacturing to evolve. Individuals who, 20 years ago, could have obtained a job at a plant with a high school degree are not able to do so now. In one of its series of reports on the skills gaps both in the United States and Europe, the JPMorgan Chase & Company reported that nearly 28,000 new middle-skill jobs with a living wage will be created in the Chicago area each year through 2019 and “as more middle-skill jobs become available, the report finds that many job seekers in the region do not have the necessary skills, training, or education to fill these well-paying, available jobs.”



A 2014 Accenture report stated that the hard-hit sectors facing middle-skills gaps included finance and insurance (68 percent), information and telecommunication (55 percent), healthcare and social assistance (54 percent), retail (51 percent), and manufacturing (49 percent) (Chanmugam, Smith, and Worrell 2014).

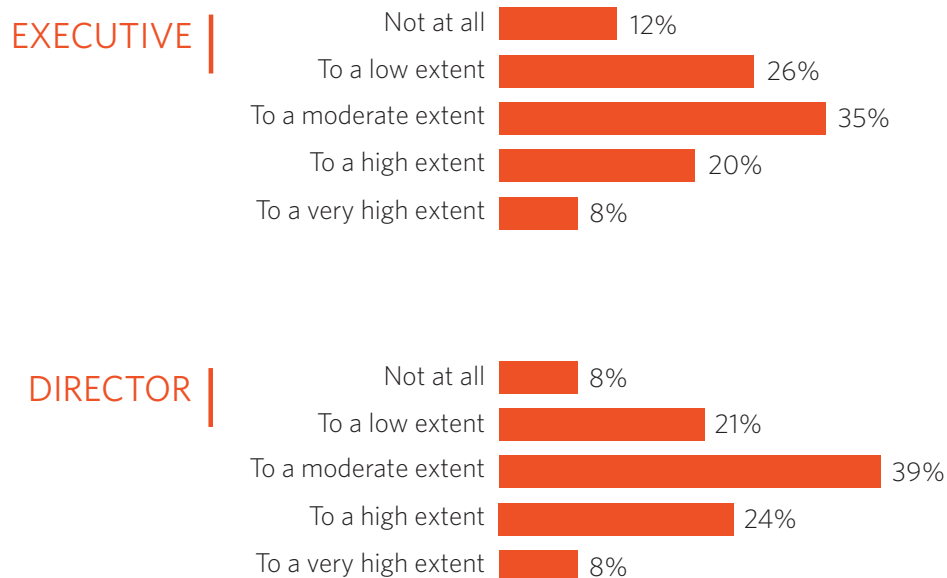
Training and education is what is needed to close the middle-skills gap. According to Economic Modeling Specialists International (EMSI), the unemployment rate is clearly aligned with educational levels. For individuals without a high school diploma, unemployment stands at 11.5 percent; that number falls to 7.4 percent for those who have a high school diploma, 6.6 percent for those who have some college yet no degree, drops substantially to 4.8 percent for those who have a two-year academic degree, and is 4 percent for those who have an occupational two-year degree.

## Management and Leadership Gap

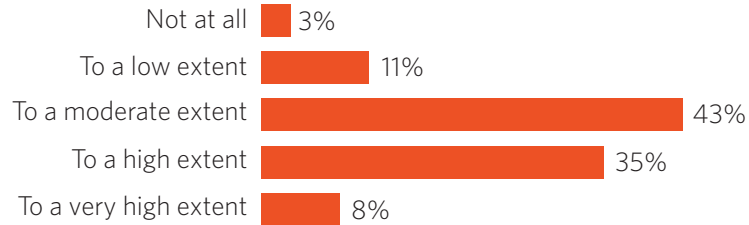
In addition to the middle-skills gap, there is a dearth of expertise and skills closer to the top, at the management and leadership level. A 2015 report by Deloitte revealed a meaningful increase in magnitude in both the management and leadership capability gap: Between 2014 and 2015 the capability gap widened two points, from 34 to 36 (Schatsky and Schwartz 2015).

Echoing this finding, in its 2015 Skills Gap Survey, ATD posed the question: “Where are the most pronounced gaps in your organization?” The gaps are found to the greatest extent at the supervisor level (manages a group) followed by the manager, and then team leader. The data show that organizations are struggling with skills gap issues—at least to a moderate extent—at the very top of the organization chart too.

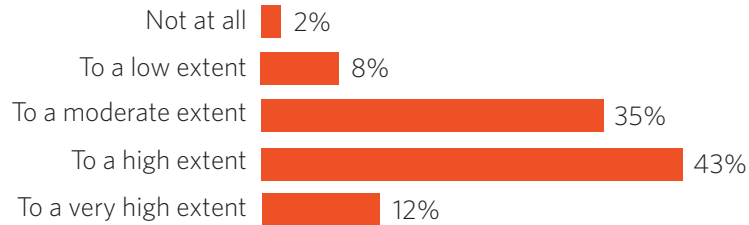
In the 2015 survey, respondents were asked: “To what extent are the skills gaps most pronounced at each of the following levels within your organization?”



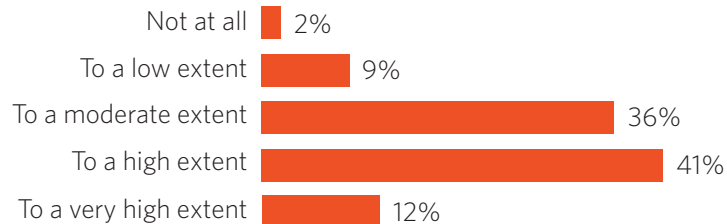
## MANAGER



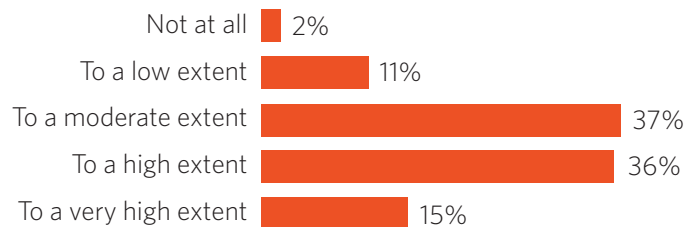
## SUPERVISOR



## TEAM LEADER



## INDIVIDUAL CONTRIBUTOR



## Communication and Service Skills

Rivaling the STEM skills gap as one of the most critical areas is communication and interpersonal skills. In today's connected economy, the ability to communicate clearly across multiple platforms is imperative. But what works on Twitter doesn't translate well in business communication. Stories about inappropriate employee behavior or responses on Twitter and other social media go viral, which can have an adverse effect on brand equity and reputation.

The pervasiveness of technology and its impact on the way we communicate and do business have, in part, created a customer-centered economy. Customers can easily do the research needed to make changes in their buying patterns, and they are far less loyal to brand. Chip Bell, senior partner with the Chip Bell Group, explained, “Some research says that brand loyalty may be down as much as 15 percent, and part of the reason is that our definition of loyalty is not just related to the image of the organization (like ads), but the experiences we have.

“If it’s not an emotional connection that is positive, we are likely to leave. We don’t tolerate indifference. We don’t even tolerate ho-hum average service. We want to be entertained. I think all of that causes the customer’s loyalty to be fickle today” (Gaul 2015).

Several respondents to the ATD Study cited an inability of employees to respond in a timely fashion to customer needs and to empathize with them. One noted how the lack of empathy affected business: “Overall, general lack of compassion and appreciation for our customers results in poor customer service.”

According to the ATD report *Leadership Development for Millennials*, “Millennials are highly qualified in technical skills, but they need to work on other competencies, particularly diplomacy, communication, listening, patience, and relationship building.” This type of training for the Millennial generation requires special attention: “Well over one-half of the survey respondents indicated that they believe the Millennial generation requires specialized leadership development programs” (ASTD 2013).

According to a 2013 Adecco report, the communication skills gap was noted to be of critical importance, “For all the traditional talk about a skills gap in technical skills, 44 percent of respondents cited soft skills, such as communication, critical thinking, creativity, and collaboration, as the area with the largest gap.” And this type of training needs to be taught alongside industry-specific and STEM skills: “Leaving college knowing how to do a specific job but not having developed stronger critical thinking and communication skills is a real disservice to students—universities need to ensure they offer a balanced education, regardless of an individual’s major or field of study.”

Leaving the skills gap issue untended would be costly. But to close it, it’s important to know where to start.

“

In the younger, entry-level hires, we see a huge communication gap and a lack of knowledge regarding grammar, spelling, and pronunciation.”

# THE PATH FORWARD: BRIDGING THE SKILLS GAP

---

The skills gap is a national issue in the United States and bridging it cannot be done by any one entity. It requires a holistic approach and recognition that preparing people to go to work with relevant skills and knowledge for jobs that exist now and in the future means that everyone has a role to play. From education to employers to government and the public workforce system, new thinking and collaboration are necessary.

Critical to all of this is the talent development professional. With deep expertise in adult learning and understanding of the need to have a knowledgeable and skilled workforce, talent development professionals will likely be the ones who will implement training strategies to bridge skill gaps that exist in organizations.

## ROLE OF THE EDUCATION-WORK PIPELINE

In 2015, The Conference Board emphasized the importance to businesses of further educational attainment by employees. “Employer-provided tuition assistance programs allow companies to hire better-quality, more-educated and more-productive employees whose increased productivity offsets most of the cost of tuition benefits.” The educational attainment not only benefits employers, but society as a whole, noted the study.

Increasingly, though, there’s a call for education and training for long-term future employment to begin much earlier than after high school. According to Pathways to Prosperity, “The most effective work-based learning takes the form of a continuum of activities. Students begin with career awareness and exploration through activities such as guest speakers and field trips. They then transition to career preparation activities . . . and finally, the career training phase of the continuum prepares students for work in specific occupations.”

The president’s 2016 fiscal year budget echoes the need for career readiness to start early. It emphasizes that, “Early exposure to a range of career and higher education information and opportunities is associated with better post-secondary education outcomes” (OMB Communications 2015).

During an UpSkill America White House summit in April 2015, participants discussed how to increase the number of apprenticeships to meet the administration’s goal of doubling their number in five years. One of the major ideas proposed was that of increasing the exposure of apprenticeships to young people while they are in high school. The intent would be to help youth—and their parents—understand the importance of developing the skills necessary for success in the future.

Reaching out to teens and their parents was one facet of a summer 2015 conference sponsored by the Brookings Institution, Preparing the Next Generation of Manufacturers Through Community Colleges. Speakers emphasized the need to change the narrative around apprenticeships as well as what it means to “go to college.”

Employers are getting in on the act, too. One example is Newport News Shipbuilding, which engages local elementary and secondary school students with education opportunities. Others, like Microsoft, Google, and the Smithsonian Institution have internships for high school students.



Companies need to start working with colleges so that students get the necessary skills to fill the gap.”

~ Dan Schawbel

Counseling students in high school about what they want to do, and providing information about their many options—including community college, apprenticeships, and credentialing—is important. Michigan’s Career Jump Start gives students information, offered through career liaisons, about high-demand jobs and training programs. The program focuses on shorter-term credentialing rather than four-year bachelor’s programs; it also reaches out to parents and educators.

Obtaining a two-year degree and becoming credentialed, rather than obtaining a four-year degree, can be a critical step in providing the training needed for a successful career. Employers often look for graduates of industry certification courses offered at community colleges. According to a 2012 Georgetown University Center on Education and the Workforce study, “Certificates with economic value are cost-effective, partly because they are the quickest education and job training awards offered by American higher education.” In “Community Colleges and the Skills Gap,” Tom Snyder noted that, “Community colleges are now America’s best hope for both lower and middle class Americans looking for an affordable education that leads to a well-paying job.”

As *Forbes* contributor Dan Schawbel wrote, difficulty finding skilled candidates will “progress until the college curriculum aligns with the current job marketplace. . . . Companies need to start working with colleges so that students get the necessary skills to fill the gap” (Schawbel 2014).

Earning while learning through apprenticeships, lower-cost community colleges, and credentialing are all means to open doors for disadvantaged students. During a July 2015 forum at the Brookings Institution in Washington, D.C., Montgomery College president DeRionne Pollard spoke about a West Virginia coal miner who learned about HVAC training at Montgomery College. He moved his family to Maryland, and after he went through training, he changed the narrative for his family by securing a job and a brighter future.

## RHODE ISLAND-BASED TACO, INC.

Third-generation owner and operator of Cranston, Rhode Island-based Taco, Inc.—manufacturer of pumps, valves, tanks, electronic controls, and other components for heating and cooling applications—John Hazen White Jr. spoke about his commitment to the company's employees and the community during a July 8, 2015, event at the Brookings Institution in Washington, D.C. This commitment is exemplified in ensuring employees are trained, which is done by outside professors and teachers.

White praised the colleges in Rhode Island for being very responsive to doing their part in keeping jobs in the state by partnering with employers and offering curricula to train workers. As a businessman, when you need talent, he explained, you have two options: replacing people or training them. "People are never obsolete," he said. White agrees there is a skills gap, and believes workplace and educational training is an employer's responsibility. "We just need to train them," he stated.

White's family business has established the Taco Learning Center, which provides needed education for many of its foreign-born employees who benefit from learning English, for example. Because he feels socially responsible, White's company offers those types of courses free of charge to employee families as well. The classes range from safety to fitness to classes that help employees earn their high-school proficiency exams.

The training, done through local high schools or community colleges, seems to have a positive effect on Taco's workforce. The turnover rate is less than 0.5 percent, while the industry average is 30 percent.

The company now employs more than 600 individuals in the United States, Canada, and Vietnam. Taco, Inc.'s products are sold worldwide.

## ROLE OF APPRENTICESHIPS

The federal government and the business community are realizing how important apprenticeships are to the present and future U.S. economies. The 2016 budget proposed by the Obama administration includes investments to ultimately double the number of registered apprenticeships in the United States over the next five years. The intent is to have workers learn while they earn and to have them develop skills that will translate to good jobs in the future (OMB Communications 2015).

In a June 2014 speech, Secretary of Labor Thomas Perez noted that federal workforce investment programs had served 2 million people during the previous year. He further stated that the federal government has an important role to play in promoting apprenticeships, because for every federal dollar spent on apprenticeships, there is a \$27 return.

The perception of apprenticeships—that they are for manufacturing and low-skill jobs—must be addressed for them to be successful. The U.S. government recently announced the launch of an American Apprenticeship Grants competition to provide \$100 million to develop apprenticeships in high-growth

fields such as information technology, healthcare, and advanced manufacturing. Companies in these high-growth fields can learn from other industries that have extensive experience in using federal funds to build apprentice programs to effectively keep their workforces appropriately skilled. Bath Iron Works and the Portsmouth Naval Shipyard both use apprenticeships to remain competitive. The shipyard has a model apprenticeship program that fulfills requirements by the U.S. Navy to overhaul and modernize submarines.

In North Carolina, several local businesses created the North Carolina Triangle Apprenticeship Program. This collaborative effort produces workers who have the skills needed by businesses in the area. Bühler Aeroglide is one of the companies whose apprentices concurrently take instruction at Wake Technical Community College. The apprenticeship program emphasizes trade skills and also learning in the STEM areas.

## ROLE OF THE PRIVATE SECTOR

According to the Manpower Group, the role of employers is to design new people practices, foster a learning culture, and encourage employees to take responsibility for their own careers (ManpowerGroup 2015).

According to ATD's *2014 State of the Industry* report, organizations spent an average of \$1,208 per employee on training and development in 2013, only a 1 percent increase over the previous year. And the number of learning hours increased slightly, from 30.3 hours to 31.5 hours (ATD 2014b).

There is variance in training focus between midsize and large organizations, with large organizations typically spending less. According to the *2014 State of the Industry* report, more than two-thirds of training involves an instructor, either through an instructor-led classroom, through an online instructor, or remotely by an instructor. While companies are investing in training and development for their employees, it may not be enough to match the rapid changes brought about by technology and globalization.

This requires funding, and for many employers finding help to upskill or reskill their workers is daunting. The U.S. Chamber of Commerce Foundation's report on the talent pipeline suggests that employers should have more flexibility in solving their learning and development needs: "Formula and discretionary spending across a wide variety of federal and state programs can be repurposed to support employers and their collaboratives in organizing and managing diverse and flexible talent pipeline partnerships. Funding should flow to those education and workforce providers that employers identify as their preferred sources of talent" (Tyszkowski, Sheets, and Fuller 2014).

Employers need to do a better job of identifying and clearly communicating the skill needs they have. Committee for Economic Development vice president of education Cindy Cisneros echoed this: "Those who reached out to local community colleges and universities ended up developing productive partnerships, but it's not easy to do. One challenge is that the language of business can be different from that of higher education. Another is the willingness of higher education to listen to the needs of businesses. And a third challenge is for businesses to articulate their true needs, not only for current workforce development, but also the development of their talent pipeline" (CED 2015).

## ROLE OF PARTNERSHIPS

Collaboration among government, business, educational entities, and community organizations is paramount in alleviating the skills gap issue. The Accenture report noted, “Better communication with government workforce agencies and community-based organizations can improve the matching of qualified people with available jobs. Better internship and apprenticeship programs, combined with more effective training for entry-level positions, can create larger pools of qualified workers” (Chanmugan, Smith, and Worrell 2014).

The recently passed Workforce Innovation and Opportunity Act “gives businesses the opportunity to partner with workforce investment boards, school districts, community colleges, and nonprofits nationwide to build career ladders for entry-level and other workers, and to drive and support regional sector strategies that meet the workforce needs of employers” (Duncan and Perez 2014).

Community colleges and businesses make a perfect match in helping to fill the skills gap. As their name indicates, community colleges often have closer ties with local businesses, so the lines of communication may already be in place. Training and educational providers and employers need to work together not only on subject content but also on scheduling issues. For example, instruction must be scheduled to accommodate the students, so that they are able to work during a certain part of the week and then take classes either on other days of the week or in the evening.

The Portsmouth Naval Shipyard is a great example. It has partnered with Southern Maine Community College to provide training for the specialized skills needed in the shipbuilding industry, now and in the future. Another is South Carolina’s readySC program, which is designed to provide training programs that employers need for their workers through the state’s technical colleges; the program served 81 companies in the 2013-2014 fiscal year and trained 4,700 workers.

Local Workforce Investment Boards—created as part of the original Workforce Investment Act—are a critical part of the partnering solution as well. They bring together community stakeholders to converse about the skills needed on the state and local level, and initiate resources to ensure that the programs are in place to fill outstanding skill gaps.

Partnerships can help the system of credentialing advance as well. For credentials to have significance, they must be usable within the industry and across states. It is important for employers, employees, and trainees to see their validity. Individuals must have a place to go to learn about such training opportunities. Stackable credentials that show progression and growth aid life-long learning and can help with career development. During the UpSkill America summit held at the White House, participants discussed one possible way to move this forward: Establish a national credentialing commission.



## ROLE OF THE PUBLIC WORKFORCE SYSTEM

The Workforce Innovation and Opportunity Act (WIOA) is key to unlocking federal funds for training. With ATD's strong support, the bill—which would reinstate the 1998 Workforce Investment Act—garnered nearly unanimous bipartisan support after a year of negotiation, and was signed into law by President Obama on July 22, 2014. Writing in support of the long-overdue reauthorization of the legislation, ATD president and CEO Tony Bingham and ATD Public Policy Council chair Bill Docalovich said, “Regardless of the economic climate, it is critical that organizations of all sizes recruit, develop, and retain their human capital to achieve and sustain a competitive advantage. To do this, employers must have access to a workforce development system that helps them invest in developing their employees” (ATD 2015).

WIOA supports one-stop career centers, which provide services for both individuals looking for training and employers seeking to fill their workforce gaps and meet training needs. They are managed by regional workforce investment boards (WIBs) composed of business representatives, education providers, labor organization members, and community-based organization members, among others. WIBs and one-stop career centers are the heart of local workforce development systems, the pass through for federal training dollars, and a key resource for closing the skills gap at the local and regional levels.

At the federal and state levels, the government can work with employers to address local and regional hiring needs, and be responsive to training programs that will fill those requirements. What follows are state-level examples that are helping to close the skills gap.

### **GEORGIA: SUPPORTING THE BIOMEDICAL AND MANUFACTURING INDUSTRIES THROUGH QUICK START**

Georgia's Quick Start program is not new, but that doesn't mean it isn't critically important to the current economic well-being of the state, businesses, and individuals. For more than 40 years, the Technical College System of Georgia's state-funded workforce development program has worked with businesses to provide the necessary training for companies that create 15 or more jobs during a 12-month period.

Quick Start delivers training in classrooms, at the business site, or in mobile labs—wherever they can

best serve the need. A few success stories have included Kia Motors, Caterpillar, and Quintiles Laboratories North America, a pharmaceutical company. Governor Nathan Deal had this to say about Kia and Quick Start: “Kia's presence here has been a magnet for automotive suppliers. And our ready-to-work, highly trained workforce ensures that Georgia stays in the running for major automotive projects” (Widener 2013; Jones 2015).

## **CONNECTICUT: SEEKING TO CONNECT WORKERS WITH JOBS THROUGH A JOINT EFFORT**

Being proactive in anticipating future skill shortages, Connecticut officials pursued federal grants to help with training costs. “As we anticipate the needs of emerging industries that offer viable employment opportunities, the funds will provide employment services to unemployed workers and connect them to new jobs,” explained Connecticut governor Dannel Malloy, in announcing the receipt of a \$3.8 million federal funding grant for job training programs in that state. “Ultimately, we’re working every day to ensure that residents have the skills necessary to attain a job for the business needs of today—and keep it,” he continued.

The funding is designed to build talent pipelines for regional and industry-specific collaborations in the state. To do so, the grant money will be used by local businesses, community colleges, trade associations, and chambers of commerce. Connecticut’s Workforce Investment Boards (WIBs) will work with community groups to determine appropriate jobs in their area and with the Connecticut Department of Labor (Brody 2015).

## **VIRGINIA: FUNDING TO SUPPORT A “WORLD-CLASS WORKFORCE”**

In June 2015, Virginia governor Terry McAuliffe announced \$900,000 in grants to help close skills gaps in industries key to the commonwealth. The funding, which requires matching funds from the private sector, extends to businesses within a common industry that design and implement creative training to develop a talent pipeline; businesses in different sectors that share the same workforce development to develop training; and individual employers that have “identified a need to lead a skills development initiative with companies who comprise that employer’s supply chain.”

In addition to urging private-public partnerships, the grants encourage using other available resources, such as workforce development boards and community colleges. As Governor McAuliffe said, “Creating and sustaining a world-class workforce is critical for building a new Virginia economy” (Commonwealth of Virginia, Office of Governor Terry McAuliffe 2015).

## **ROLE OF THE TALENT DEVELOPMENT PROFESSIONAL**

Talent development professionals should play a key role in narrowing the skills gap, both as part of partnerships with the public and private sector, and in ensuring that learning is an ongoing process for employees.

According to Deloitte: “This year, corporate learning and development (L&D) burst onto the scene as one of the most pressing business and talent issues facing our respondents. Business and HR leaders report that corporate learning capabilities are waning (39 percent say the problem is ‘very important,’ more than three

times last year's percentage), and companies are now competing heavily for new technical and professional skills. This research tells us that 2015 will be a critical year for targeted investment in learning" (Schatsky and Schwartz 2015).

Who is responsible for closing the skills gap? The ATD Study suggests that talent development (training and learning) professionals are key: 59 percent said talent development (training and learning) practitioners were responsible for closing the skills gap.

What is the best way to fill the gaps? Again, the ATD Study suggests the following solutions: 64 percent answered that providing more training internally would close specific skill gaps, 55 percent suggested identifying core competencies and targeting their development, and 50 percent said examining what skills the organization needs to be successful now and in the future.

A 2015 study by Deloitte and The Manufacturing Institute found that 94 percent of the executives polled believed that internal employee and training and development programs should be used to mitigate the effects of the existing skills shortage for the skilled production workforce. Additionally, 72 percent felt that involvement with local schools and community colleges would be beneficial, and 64 percent said that external training and certification programs would be beneficial (Giffi et al. 2015).

Talent development professionals also need to be part of the conversation. With their expertise in adult learning, they can help move the narrative forward about the benefits of lifelong learning and continuous growth for individuals who want to remain competitive in the super-accelerated business world.

To address the STEM gap, talent development professionals can incorporate relevant-to-that-industry-and-position science and math skills into their training.

# ACTION PLAN

Organizational leaders should look to their talent development professionals to help identify the skills and competencies needed now and in the future and to align their development to key drivers for their organizations. The following action plan identifies six steps for taking charge of skills gaps.

STEP 1	STEP 2	STEP 3
<b>UNDERSTAND THE ORGANIZATION'S PERFORMANCE METRICS</b> <ul style="list-style-type: none"> <li>Identify the key stakeholder to support closing the skills gap.</li> <li>Be sure you know the answers to the following questions and can articulate the connection between performance goals and employee capability. <ul style="list-style-type: none"> <li>What factors in the economy, culture, or market most influence your organization?</li> <li>What are the organization's key strategies and goals, and their performance metrics?</li> <li>What business functions have the most impact on the success of the organization?</li> <li>Which roles within those units have the most impact on the current and future success of the organization?</li> <li>What capabilities must employees at all levels have to be able to meet the performance metrics?</li> <li>How robust are the HR systems and reporting capabilities for monitoring performance, business results, and employee capabilities?</li> <li>How is the organization's business and leadership model communicated throughout the organization?</li> <li>How engaged and committed are the organization's leaders to tackling this challenge through an investment of people, processes, and systems?</li> <li>How are the demographics of the organization's workforce changing, and what impact will they have on knowledge, skills, and behaviors?</li> </ul> </li> <li>What is the state of the supply chain of talent for the business or industry, given specific strategies?</li> </ul>	<b>IDENTIFY COMPETENCIES AND SKILLS THAT MAP TO STRATEGIES AND PERFORMANCE METRICS</b> <ul style="list-style-type: none"> <li>Identify the core competencies and skills for the organization's overall workforce and the business units most critical to the organization's success.</li> <li>Identify current needs as well as those for the next one to three years.</li> <li>Working with leaders of core business functions, determine which skills and competencies their employees need to be able to meet key goals and be effective at implementing key strategies.</li> <li>Map current and future competencies to current and future strategies and goals.</li> <li>Identify the priority job(s) to develop the functional competencies required for job success.</li> <li>Identify which skills and competencies are required for meeting desired performance standards, in what timeframe, and how they will be measured.</li> </ul>	<b>ASSESS THE SKILLS GAP</b> <ul style="list-style-type: none"> <li>Define the scope of how the organization will address the gap (organization, division/unit, or individual), and consider starting with one function or business unit as a pilot.</li> <li>Use analytical tools, such as impact mapping, to identify performance behaviors required to meet specific goals.</li> <li>Conduct a capability audit to determine where gaps exist in employees' knowledge, skill, or behavior.</li> <li>Identify the consequences of <i>not</i> closing the skills gap.</li> </ul>



STEP 4	STEP 5	STEP 6
<b>SET GOALS AND PRIORITIZE THE PATH TO FILLING GAPS</b> <ul style="list-style-type: none"> <li>Establish baseline measures of employees' current skills and competencies.</li> <li>Set goals for closing gaps between existing skill sets and those needed to support current and future goals.</li> <li>Determine which paths to take to fill particular gaps: apprenticeships, reskilling, outsourcing, hiring, training and development, coaching and mentoring, and so on.</li> <li>Determine how results in filling skill gaps will be measured.</li> <li>Create an internal communication plan to educate and involve managers and employees in programs to close skill gaps.</li> </ul>	<b>IMPLEMENT SOLUTIONS</b> <ul style="list-style-type: none"> <li>With key leaders in the organization, prioritize solutions and secure funding and resources needed to do the work.</li> <li>Connect with your local Workforce Investment Board to identify opportunities to partner, and to access training funding that can assist your organization in addressing the skills gap.</li> <li>Led by the organization's talent development function, create an organization-wide plan to address the skills gap.</li> <li>Prioritize what the organization can implement and sustain, even if there are disruptions, changes, and challenges to the organization.</li> <li>Ensure there is senior leadership buy-in and engagement in every step of implementation and communication, and that they are participating as teachers.</li> <li>For identified knowledge or skill gaps, create learning and development opportunities using appropriate delivery options and leverage all forms of learning: online, formal, informal, social, and partnerships with educational institutions.</li> <li>Create individual learning plans and paths for employees. Have systems in place to measure and document skills and competencies before, during, and after training. Link all talent development goals to the organization's skill needs and priorities.</li> <li>Have a balance of quick wins, medium-term successes, and longer-term development so that measurement of success can begin immediately. Look for both leading and lagging indicators.</li> </ul>	<b>COMMUNICATE THE IMPACT</b> <ul style="list-style-type: none"> <li>Establish formal communications channels that will share relevant news related to learning impact and progress toward closing skill gaps.</li> <li>Be prepared to demonstrate how closing the skills gap has increased organizational performance, while improving productivity and reducing costs.</li> <li>Ensure the measures are truly aligned with the organization's measures of success.</li> <li>Use assessment tools to measure progress before and after learning and development takes place.</li> <li>Identify a successful stakeholder—work with that person to communicate the results.</li> <li>Communicate progress and results regularly to all stakeholders.</li> </ul> <p><b>Consider these questions:</b></p> <ul style="list-style-type: none"> <li>Did the solutions implemented have a measureable effect on narrowing the skills gap in the organization and making it more effective?</li> <li>Did the results meet expectations and demonstrate progress?</li> <li>Is the organization's workforce better equipped to meet key goals and implement strategies?</li> <li>What business results can be attributed to improvements in skill, knowledge, or desired behavior?</li> <li>Ask how closing the skills gap process can be refreshed to increase the likelihood of continued success.</li> </ul>

# A VISION FOR THE WORKFORCE

---

So, what does the current skills gap, spurred by globalization, the pace of change, and need for new skills, mean for the future of work?

In the short term, we are likely to see greater flexibility and a move away from the “usual” 9-to-5 environment, with younger workers stepping into leadership roles. Among *Forbes* contributor Dan Schawbel’s predictions for 2015, he writes about more Millennials taking on leadership roles, the growing need for succession planning—“You will start to see companies hold onto their older workers in order to transfer their knowledge to younger ones”—and companies hiring more temporary workers and consultants due to economic reasons.

Rework America, an initiative of the Markle Foundation, formulates a plan for using technology and a networked world to innovate jobs, match employers and workers, and help people prepare to succeed through credentialing. In an essay drawn from their recent book, author Zoë Baird writes, “In the modern economy, information, power, and the ability to make things happen are all distributed rather than concentrated. So why are people’s capacities judged solely by old centralized markers like a high school or college diploma? Why, in this day and age, is just one diploma the goal? Why not many rapid and affordable credentials that are better matched to today’s career paths? Why isn’t lifetime learning—accessible affordable education for all people—the norm? It’s time we ensure that careers are based on what you can do when you are ready, and not the path you didn’t choose a decade ago” (Baird 2015).

Reimagining the way work can happen, and what can be done to better prepare people for that work, has to be approached collaboratively. This points to a future world where keeping skills sharp and in line with the marketplace will be critical for the worker. And for companies to remain viable, they will need to do their part to maintain a skilled workforce that can compete. The key is training and a proactive focus on requisite job skills for both employers and those who want to work.

# CASE STUDIES

---

## STUDY 1

### CLOSING THE SKILLS GAP: SANDY SPRING BANK'S TWO-PRONGED APPROACH

With \$4.4 billion in assets, Sandy Spring Bancorp is the holding company for Sandy Spring Bank and its principal subsidiaries, Sandy Spring Insurance Corporation and West Financial Services. Sandy Spring offers a broad range of commercial and retail banking, wealth management, private banking, and trust services through its 44 community offices and six financial centers across Maryland and Northern Virginia. Through its subsidiaries, Sandy Spring also offers a comprehensive menu of insurance and investment management services. Independent and community-oriented, Sandy Spring Bank traces its origin to 1868, making it among the oldest banking institutions in the region.

#### ESTABLISHING THE SKILLS GAP

As a community bank, Sandy Spring Bank relies heavily on deposit and loan relationships from commercial businesses for revenue growth. Commercial relationship managers play a key role in sourcing, establishing, and growing business with commercial clients. These bankers possess a high level of technical skills in financial analysis and credit underwriting. Until the mid-1990s, the major banks offered management and commercial credit training programs to college graduates. Thousands of trainees came through these programs and filled the recruiting pipeline for banks of all sizes. As the “Baby Boomer” bankers who received their training in these programs retire, the available talent pipeline for credit professionals is drying up.

In the mid-2000s, Sandy Spring Bank found itself fighting this war for talent head-on. The bank's employment team was finding it almost impossible to attract candidates and often lost them in bidding wars with competitors. The bank began relying on costly external recruiters to source candidates. During the financial crisis of 2008, expense control became a strategic imperative.

#### ADDRESSING THE GAP

Sandy Spring Bank recognized the need to adopt a two-pronged approach to the problem. The first was to protect the investment associated with hiring these bankers by adding a robust onboarding process to improve retention. The bank's learning team partnered with human resources and frontline managers to develop a highly structured onboarding experience. During the first 90 days of employment, they prepared new commercial bankers to be successful in a new environment with a combination of the right tools and relationships. The goal is to immediately engage the new hire in the culture and as a member of the team.

Sandy Spring Bank began focusing on high-touch onboarding for this critical job role in 2010 with detailed checklists and scheduled “meet and greets.” They ramped up the program in 2013 by adding structured meetings and rotational visits with internal subject matter experts and internal partners. Since 2013, 13 commercial relationship managers have been through the program.

The second tactic was to create a career path and development plan for branch managers to develop the skills needed for the more specialized commercial banker role. They created a new job role, the market relationship manager, to create a bridge between branch managers and commercial relationship managers. These bankers are responsible for sourcing and developing relationships with small to mid-size businesses with less-complex, lower dollar lending needs. To prepare branch managers to work in conjunction with these market relationship managers and to groom them for this role in the future, the learning and professional development team partnered with the manager of the new team to develop a competency-based curriculum that featured case studies, role play, and job shadowing. These sessions were delivered by subject matter experts who could use real-world examples and expertise to make the learning relevant and relatable to the branch managers.

These two steps are only the beginning. One of Sandy Spring Bank’s corporate values is, “Take the Long View.” The bank has begun the planning and development of an in-house commercial banking apprenticeship program to identify and grow its own talent. The bank expects to roll out a 12- to 18-month pilot program in 2016 with a small cohort of two to three internally recruited bankers. The program will feature foundational training from subject matter experts, rotational assignments to learn the credit process, internal mentoring from experienced commercial relationship managers, and job shadowing to gain experience with business development.

## THE RESULTS

The results from the bank’s focus on high-touch onboarding for commercial relationship managers have been encouraging. Retention has increased by approximately 25 percent and fees paid to outside recruiters have dropped more than 80 percent.

The bank is also encouraged by the early results from the career path and development efforts. Within 12 months of establishing the new job role and delivering skills-based training, two branch managers have been promoted to market relationship managers. In addition, one market relationship manager has been promoted to a commercial relationship manager.

Although early in the planning stages of the commercial banking apprenticeship program, the bank’s goal is to avoid the devastating impact of what would be a mission critical skills gap: the lack of commercial relationship managers to source new business relationships for the company. The bank has taken a proactive stance on developing this program far in advance of the need in order to position itself as an employer of choice able to attract and retain the best and brightest talent.



## STUDY 2

# CLOSING THE SKILLS GAP: IBM'S FEMALE DISTINGUISHED ENGINEERS

At its heart, IBM has always been a technology company. To support its technology strategies, IBM created a prestigious Distinguished Engineer (DE) program nearly two decades ago to recognize deep technical expertise across the company. The journey to DE can take many years and includes rigorous corporate standards, reviews, and multi-year milestones. Proven superior technical performance, IBM thought and patent leadership, external recognition, and references are just a few of the necessary elements needed to qualify for the title of distinguished engineer. Only 0.15 percent of all IBMers achieve this most senior technical executive position. Once achieved, this position carries with it a substantial responsibility as an IBM executive and technical leader, consulting on worldwide business strategy and accreditation.

At the corporate level, the number of women pursuing and achieving DE status was not aligned to the overall technical population. In addition, the proportion of women in technical careers drops significantly as they move up the technical ladder leading to DE. This was of concern to executives at the highest levels in IBM, including the CEO.

The Technical Women's Pipeline Program (TWPP) was designed to enable the promotion of highly qualified technical women into the highest non-executive technical leadership roles and leverage this pool to be considered for accelerated DE accreditation.

Technical eminence, technical innovation, and global technical leadership are foundational to the long-term success of IBM. Quite simply, clients expect IBM's technical leaders to be the best. It's also critical for women to be as highly represented in senior technical careers as they are in the rest of IBM, accurately reflecting the makeup of the client populations IBM serves. Building and developing that pipeline of women technical leaders is vital to meeting IBM's business goals. Critical skills gaps met through TWPP include identifying barriers to career progression (particularly those facing women), improving their own brand and eminence, and clearly identifying individual gaps (with development plans) to achieving distinguished engineer.

High-potential women are identified and nominated to participate in the multi-year program, which includes a two-day workshop, where each candidate is personally supported by an IBM business executive sponsor and a technical executive DE coach. Only 100 women are selected each year.

The two-day workshop kicks off executive coaching relationships and targeted learning. Participants get assistance with their DE nomination packages and create multi-year development road maps.

Since the program began in 2009, the TWPP:

- increased the number of women pursuing senior technical careers and official designation as IBM Distinguished Engineers
- increased the number of women pursuing senior or executive technical careers that could ultimately lead to senior technical roles
- invested in executive sponsorship, coaching, and support to help high-potential women overcome barriers and achieve their career goals.

As of year-end 2014, IBM has more than 300 DE candidates, 200 coaches, and 140 executive sponsors in the program. The ultimate measure of program success is the increase in women in senior technical roles with the potential to become distinguished engineers during the next five years. More than 50 percent of program graduates have been promoted to senior technical leadership positions, including 11 to distinguished engineers or fellow.

Dedicated company executive sponsorship at a high level has been essential for the success of the program. In addition, the ongoing coaching by senior executives and distinguished engineers is the differentiating component to achieve long-term results.

This award-winning Technical Women's Pipeline Program has proven to be instrumental in increasing the number of women in senior technical executive positions to support IBM's long-term strategic goals.

### STUDY 3

## PARTNERING WITH HIGHER EDUCATION: VALSPAR AND CAPELLA UNIVERSITY

Valspar is a global leader and innovator of high-quality consumer paints, industrial coatings, and value-added coating services. The matrixed global organization's 10,500 employees do business in 100 countries and speak 15 languages. The dispersed nature of the workforce has historically created challenges for delivering learning and development initiatives. One of the structural challenges of the program is to design ways to engage critical frontline leaders in development activities while they continue to deliver upon their responsibilities within a lean organization. These leaders typically have limited time to attend structured development discussions or training, and their schedules frequently change in response to business priorities.

However, Valspar identified the following development needs for their frontline leaders: greater self-awareness and awareness of others, skills for managing conflict constructively, the ability to diagnose and inspire team performance and engagement, skills for influencing without authority, and increased strategic perspective. To address these gaps, Valspar wanted to find a higher education partner that could provide engaging and innovative online courses that could be attended asynchronously and promise a high return on investment.

Valspar partnered with Capella University, which is piloting a virtual leadership development program called LEAP (learn, evaluate, apply, perform). LEAP is Capella University's customizable, nine-month, nondegree program that creates a cross-functional and cross-business learning cohort within an organization. The program emphasizes self-paced learning combined with intermittent, high-quality touch points with the group, coaches, and the participants' managers and team members. Valspar has a unique culture that, like Capella's, needs to be nimble in the face of shifting economic and technological change. LEAP is built on a train-the-trainer model, allowing Valspar to incorporate its culture into the courses through facilitation by key members of its leadership team. Valspar's LEAP cohort consists of 20 employees.

LEAP blends e-learning, self-assessments and peer feedback, virtual cohort interaction, and one-to-one coaching support to help participants develop competencies in experiential ways. The format and sequence of training delivers a media-rich, engaging course-room experience that is entirely online and tablet-ready. Real-world simulations and on-the-job activities are threaded throughout to give participants immediate practice and provide impact. LEAP includes six courses: Personal Mastery, The Agile Leader, Leading and Managing Change, Communicating Effectively, Leading Effective Teams, and Building Business Acumen.

Results and participant feedback at the half-way point were quite positive. Accountability and measurement are focused on participants' individual written development plans as well as anecdotal evidence from peers that change has occurred. Survey responses from participants' managers and direct reports at the conclusion of LEAP point to the following:

- They now do things differently. Participants identified new ways to think and new leadership behaviors to increase their versatility of style. They then adopted these new ways, which others around them actually observed.
- They have shown an ability to learn and apply new approaches previously outside their comfort zone or ability range.

LEAP enables Valspar leaders to engage in self-directed and self-paced training on key content and to "own their own development," but also remain accountable and connected to the organization as they apply new competencies on the job. Participants with intense cyclical or project responsibilities, such as quarter-end accounting or new product launch, praise the format for allowing them to step away during periods and catch up to the recommended trajectory later without missing anything important. The next phase of deployment at Valspar includes a group check-in with executive sponsors to share their progress as a cohort and discuss individual impact.

## STUDY 4

# PARTNERING WITH HIGHER EDUCATION: UNIVERSITY HEALTH SYSTEM AND CAPELLA UNIVERSITY

University Health System (UHS), an academic medical center in San Antonio, Texas, is proactively addressing the nursing skills gap and promoting the advanced competencies of its nursing staff through a partnership with education provider Capella University.

The pressure on upskilling nurses stems from a mandate from the Institute of Medicine (IOM) for nurse leaders to work collaboratively with academic institutions to increase the proportion of nurses with a baccalaureate degree (BSN) from 50 to 80 percent, and double the number of nurses with doctoral degrees by 2020. Highly educated nurses play a crucial role in maintaining patient safety and improving patient satisfaction. A recent study from the University of Michigan found that a 10 percent increase in BSN nurses was associated with lowering patient mortality by 10.9 percent. The study also found that patients receiving 80 percent or more of their care from BSN nurses had shorter lengths of stay and lower odds for readmission.

University Health System is recognized as an American Nurses Credentialing Center Magnet Program. It is committed to developing talent in all roles, and regularly partners with higher education providers to meet training and education needs. Capella University provides the type of nursing education needed by hospital staff, and has a comprehensive portfolio of academic offerings that are well suited to meet the needs of all levels of education desired by UHS nurses. This narrows the education-practice gap. Capella's online courses and competency-based curricula are designed specifically to meet the education needs of working adults.

Since 2011, the number of BSN-educated nurses on staff at UHS has increased by 10 percent, to 61.5 percent, which positions them to meet IOM recommendations. As a partner in this pursuit, Capella University is creating value for both employer and employee, through cost containment and competency-based education that goes above and beyond bridging the skills gap to a model where Capella and University Health Systems are aligned to solving strategic workforce issues together.

## STUDY 5

# SECURING GRANT FUNDING TO EXPAND AN APPRENTICE PROGRAM: NEWPORT NEWS SHIPBUILDING

Historically the success of a shipbuilding company has always been tied to the skills of its workforce. As ship construction and ship component technologies have increased in complexity, there has been an even greater reliance on skills and longer-term development. Unfortunately, the traditional sources of labor within the community (high schools, technical schools, and community colleges) have been challenged to keep pace with this increase in middle-skills jobs.

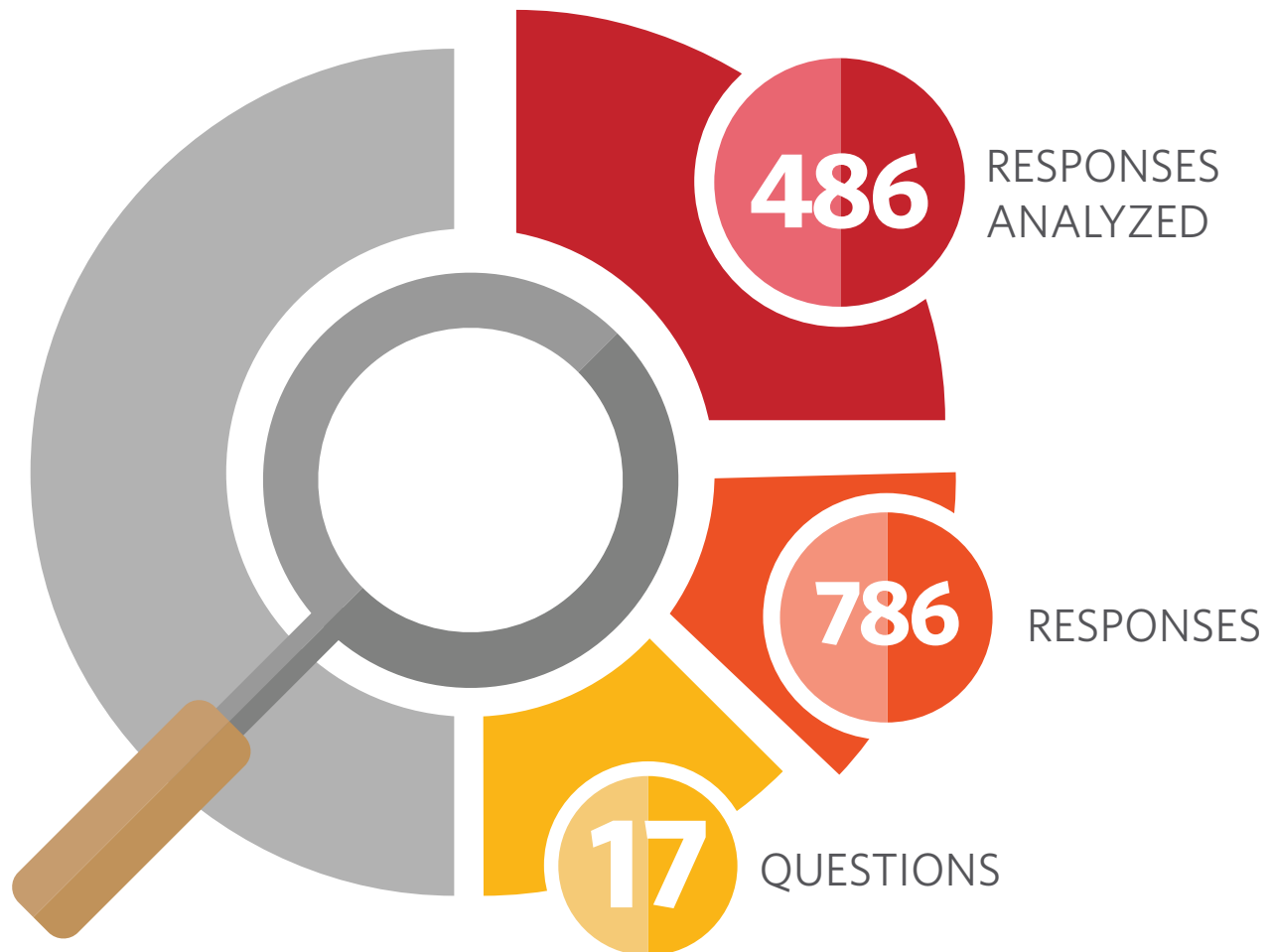
The largest shipyard in the United States, Newport News Shipbuilding (NNS), has used an apprentice program since 1919. The Newport News Apprentice School has been used to develop crafts workers and leaders within the company. This program has changed greatly during the last 10 years due to the increase of technologies and lack of adequate feeder programs. This created a greater need for investment in the NNS Apprentice School.

To support these new ship technologies and workforce needs, in 2009 Newport News entered into an agreement with the Commonwealth of Virginia that would allow commonwealth grant funding for a new facility, with NNS committing to hiring at least 1,000 new workers, maintaining a significant student body at the apprentice school, and continuing to make significant capital and workforce investments. NNS has met those commitments and has allowed for construction of a new apprentice school facility, which was opened in 2013. In addition to new facilities, there has been a focus on developing and implementing new apprenticeship tracks to support new skills in production. In fact, several apprentice tracks now lead past the “middle skills,” and result in a bachelor’s degree in marine engineering and project management.

# METHODOLOGY

---

The 2015 ATD Skills Gap Survey was fielded in May 2015. The survey was composed of a total of 17 questions. We received 786 responses of which 486 were analyzed. The input came from talent development professionals with titles of manager and above, who serve in organizations of various sizes and industries.



## EVERYONE HAS A ROLE TO PLAY IN CLOSING THE SKILLS GAP. HERE IS WHAT YOU CAN DO NOW:

Higher Education	Employers	Government Agencies	Workforce Investment Board Members	Parents	Students
Work with employers to better understand skill needs in different industries.	Make solving the skills gap an ongoing priority for the organization.	Make employers a partner in training programs.	Set up industry specific groups based on community needs.	Coach children on what it means to be ready to go to work (communication skills, attention to detail, and honoring deadlines).	Understand what skills employers are looking for.
Provide courses to help fill skill gaps.	Partner with the public workforce system to identify needed skills and open jobs.	Respond to employers with speed and agility.	Plan training and investments around the skills gap.	Have children learn about career and technical education programs offered in schools.	Take courses and enroll in programs that build skills that are needed by employers.
Develop internship programs with area employers to build skills for students.	Make area educational institutions partners in keeping your talent pipeline full.		Market your capabilities and services to area employers.	Learn about employers and industries in the community and skills needed to be employed.	Seek out volunteer opportunities and internships to grow skills.
Partner with the Public Workforce System to identify courses that meet training needs, including industry certificates and certifications.	Offer employees volunteer opportunities with community groups to teach/mentor in programs that are addressing skill gaps.		Invite youth to participate in extracurricular activities that will grow STEM skills such as FirstRobotics.	Encourage the study of STEM subjects and job-marketable certificates.	Attend career fairs and explore careers, requirements, and income potential.
	Participate in career fairs and promote needed skills.		If not already, sponsor career fairs to promote careers available and skills needed in the area.		Understand what it means to be "ready to work."

# REFERENCES

---

- Accenture. 2014. *U.S. States: For Richer, for Poorer?* Accenture. [www.wtb.wa.gov/Documents/U.S.StatesRicherPoorerCombined.pdf](http://www.wtb.wa.gov/Documents/U.S.StatesRicherPoorerCombined.pdf).
- Adecco. 2013. "Mind the Skills Gap." Adecco. [www.adeccousa.com/employers/resources/Pages/navigating-the-job-related-skills-gap.aspx](http://www.adeccousa.com/employers/resources/Pages/navigating-the-job-related-skills-gap.aspx).
- ASTD. 2013. *Leadership Development for Millennials: Why It Matters*. Vol. 4, No. 5. Alexandria, VA: ASTD Press.
- ASTD Public Policy Council. 2012. "Using Public Resources to Enhance Learning." *Infoline*. Alexandria, VA: ASTD Press.
- ASTD Public Policy Council. 2013. "Strategies for Narrowing the Skills Gap." *Infoline*. Alexandria, VA: ASTD Press.
- ATD. 2014a. *Change Agents: The Role of Organizational Learning in Change Management*. Alexandria, VA: ATD Press.
- ATD. 2014b. *2014 State of the Industry*. Alexandria, VA: ATD Press.
- ATD. 2015. "ATD Public Policy Council Advocates for Profession and Workforce Development Opportunities." *ATD Conference Daily*, May 17. [www.td.org/Publications/Conference-Daily/Articles/2015/Monday/Public-Policy-Council](http://www.td.org/Publications/Conference-Daily/Articles/2015/Monday/Public-Policy-Council).
- Baird, Z. 2015. "Everyone Has a Meaningful Place in the New Economy." *The Aspen Journal of Ideas*, May/June. <http://aspden.us/journal/editions/mayjune-2015/everyone-has-meaningful-place-new-economy>.
- Bessen, J. 2014. "Employers Aren't Just Whining—the 'Skills Gap' Is Real." *Harvard Business Review*, August 25. <https://hbr.org/2014/08/employers-arent-just-whining-the-skills-gap-is-real>.
- Biden, J. 2014. "Ready to Work: Job-Driven Training and American Opportunity." The White House, July. [www.whitehouse.gov/sites/default/files/docs/skills\\_report.pdf](http://www.whitehouse.gov/sites/default/files/docs/skills_report.pdf).
- Brody, D. 2015. "Connecticut Receives \$3.8 Million for Job Training Programs." Westfair Communications, June 23. <http://westfaironline.com/72376/connecticut-receives-3-8-million-for-job-training-programs>.
- Burning Glass Technologies and Capital One. 2015. *Crunched by the Numbers: The Digital Skills Gap in the Workforce*. Burning Glass Technologies, March. [http://104.239.176.33/wp-content/uploads/2015/06/Digital\\_Skills\\_Gap.pdf](http://104.239.176.33/wp-content/uploads/2015/06/Digital_Skills_Gap.pdf).
- Business Performance and Innovation (BPI) Network. 2015. *Innovation: The New Competitive Equation*. BPI Network. [www.bpinetwork.org/thought-leadership/studies/52/download-report-innovation-the-new-competitive-equation](http://www.bpinetwork.org/thought-leadership/studies/52/download-report-innovation-the-new-competitive-equation).



- Cahill, C., and S. Jackson. 2015. *Not as Hard as You Think: Engaging High School Students in Work-Based Learning*. Jobs for the Future, May. [www.jff.org/publications/not-hard-you-think-engaging-high-school-students-work-based-learning](http://www.jff.org/publications/not-hard-you-think-engaging-high-school-students-work-based-learning).
- CareerBuilder. 2014. *The Shocking Truth About the Skills Gap*. CareerBuilder. [www.careerbuildercommunications.com/pdf/skills-gap-2014.pdf](http://www.careerbuildercommunications.com/pdf/skills-gap-2014.pdf).
- Carnevale, A.P., S.J. Rose, and A.R. Hanson. 2012. *Certificates: Gateway to Gainful Employment and College Degrees*. Washington, D.C.: Georgetown University Center on Education and the Workforce. [www.insidehighered.com/sites/default/server\\_files/files/06\\_01\\_12%20Certificates%20Full%20Report%20FINAL.pdf](http://www.insidehighered.com/sites/default/server_files/files/06_01_12%20Certificates%20Full%20Report%20FINAL.pdf).
- Change the Equation and Business Roundtable. 2014. "CEOs Say Skills Gap Threatens U.S. Economic Future." News release. Change the Equation, December 3. <http://changetheequation.org/press/ceos-say-skills-gap-threatens-us-economic-future>.
- Chanmugam, R., D. Smith, and L. Worrell. 2014. *Finding the Middle: How Businesses Can Manage the Talent Pipeline to Close the Middle-Skills Employment Gap*. Accenture. [www.accenture.com/t20150723T012620\\_\\_w\\_\\_/us-en/\\_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Dualpub3/Accenture-Finding-The-Middle-How-Businesses-Can-Manage-The-Talent-Pipeline-To-Close-The-Middle-Skills-Employment-Gap.pdf](http://www.accenture.com/t20150723T012620__w__/us-en/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Dualpub3/Accenture-Finding-The-Middle-How-Businesses-Can-Manage-The-Talent-Pipeline-To-Close-The-Middle-Skills-Employment-Gap.pdf).
- Collins, S. 2015. "Building a Strong Workforce." Susan Collins Weekly Column, May 29. [www.collins.senate.gov/public/index.cfm/weekly-column?ID=9a5aa540-c9d5-4659-9ff9-46dfcedeadb5](http://www.collins.senate.gov/public/index.cfm/weekly-column?ID=9a5aa540-c9d5-4659-9ff9-46dfcedeadb5).
- Committee for Economic Development of The Conference Board (CED). 2015. "The Role of Business in Promoting Educational Attainment: A National Imperative." The Conference Board, February. [www.ced.org/pdf/Report\\_-\\_CED\\_-\\_The\\_Role\\_of\\_Business\\_in\\_Promoting\\_Educational\\_Attainment.pdf](http://www.ced.org/pdf/Report_-_CED_-_The_Role_of_Business_in_Promoting_Educational_Attainment.pdf).
- Commonwealth of Virginia, Office of Governor Terry McAuliffe. 2015. "Governor McAuliffe Announces Talent Solutions Grant Competition for Economic Development." News release. Virginia.gov, June 10. <https://governor.virginia.gov/newsroom/newsarticle?articleId=8564>.
- Covington News. 2015. "A Jump Start for Employment." *Covington News*, January 10. [www.covnews.com/archives/57682](http://www.covnews.com/archives/57682).
- Danaher, T. 2014. "U.S. Small Businesses Hit Hardest by Skills Gap." *Financial Sense*, July 17. [www.financialsense.com/contributors/guild/u-s-small-businesses-hit-hardest-by-skills-gap](http://www.financialsense.com/contributors/guild/u-s-small-businesses-hit-hardest-by-skills-gap).
- Dobbs, R., J. Manyika, and J. Woetzel. 2015. "How U.S. Companies Can Fill the Skills Gap." *Fortune*, May 12. <http://fortune.com/2015/05/12/how-u-s-companies-can-fill-the-skills-gap>.
- Duncan, A., and T. Perez. 2014. "Empowering Today's Economy by Training Tomorrow's Workforce." Homeroom: The Official Blog of the U.S. Department of Education, November. [www.ed.gov/blog/2014/11/empowering-todays-economy-by-training-tomorrows-workforce](http://www.ed.gov/blog/2014/11/empowering-todays-economy-by-training-tomorrows-workforce).
- Economic Modeling Specialists International (EMSI). 2014. "Middle-Skill Spotlight: An Analysis of Four In-Demand Sectors With a Community College Focus." EMSI. [www.smc.edu/AcademicAffairs/Workforce/Documents/EMSI%20Middle%20Skill%20Spotlight.pdf](http://www.smc.edu/AcademicAffairs/Workforce/Documents/EMSI%20Middle%20Skill%20Spotlight.pdf).

- Eddy, N. 2015. "IT Skills Gap Negatively Impacting Businesses." *eWeek*. July 1. [www.eweek.com/small-business/it-skills-gap-negatively-impacting-businesses.html](http://www.eweek.com/small-business/it-skills-gap-negatively-impacting-businesses.html).
- Fishell, D. 2015. "Feds Give Maine \$3.66 Million to Help Unemployed." *Bangor Daily News*, June 18. <http://bangordailynews.com/2015/06/18/news/state/feds-give-maine-3-66-million-to-help-unemployed>.
- Gaul, P. 2015. "Chip Bell." *TD*, 69(2): 68-69.
- Giffi, C., J. McNelly, B. Dollar, G. Garrick, M. Drew, and B. Gangula. 2015. *The Skills Gap in U.S. Manufacturing: 2015 and Beyond*. Deloitte/Manufacturing Institute. [www.themanufacturinginstitute.org/~media/827DBC76533942679A15EF7067A704CD.ashx](http://www.themanufacturinginstitute.org/~media/827DBC76533942679A15EF7067A704CD.ashx).
- Jones, W.C. 2015. "Georgia Using Training Centers as Tool for Attracting Industry and Getting It Working Faster." *OnlineAthens*, June 1. <http://onlineathens.com/mobile/2015-05-30/georgia-using-training-centers-tool-attracting-industry-and-getting-it-working>.
- JPMorgan Chase. 2015. "JPMorgan Chase Releases Skills Gap Report in Chicago." News release. BusinessWire, June 9. [www.businesswire.com/news/home/20150609006390/en/JPMorgan-Chase-releases-Skills-Gap-Report-Chicago#.VglWu9JViko](http://www.businesswire.com/news/home/20150609006390/en/JPMorgan-Chase-releases-Skills-Gap-Report-Chicago#.VglWu9JViko).
- Kang, C. 2015. "No One in Washington Is Talking About the Problems With the Sharing Economy, Except This Lawmaker." *The Switch* blog, June 26. [www.washingtonpost.com/news/the-switch/wp/2015/06/26/no-one-in-washington-is-talking-about-the-problems-with-the-sharing-economy-except-this-lawmaker](http://www.washingtonpost.com/news/the-switch/wp/2015/06/26/no-one-in-washington-is-talking-about-the-problems-with-the-sharing-economy-except-this-lawmaker).
- Leonard, D., W. Swap, and G. Barton. 2014. "What's Lost When Experts Retire." *Harvard Business Review*, December 2. <https://hbr.org/2014/12/whats-lost-when-experts-retire>.
- Lindgren, R. 2015. "Baby Boomer Brain Drain [Infographic]." UNC Kenan-Flagler Business School, April 28. <http://onlinemba.unc.edu/blog/baby-boomer-brain-drain-infographic>.
- Louden, B.J. 2015. "Working Here: Middle-Skills Gap Widens." *Democrat and Chronicle*. June 29. [www.democratandchronicle.com/story/money/business/working-here/2015/06/26/middle-skills-working/29276221](http://www.democratandchronicle.com/story/money/business/working-here/2015/06/26/middle-skills-working/29276221).
- Lynch, M. 2015. "Published Report Identifies Steps to Close Skills Gap for Low-Income Students." *Education Week*, June 24. [http://blogs.edweek.org/edweek/education\\_futures/2015/06/published\\_report\\_identifies\\_steps\\_to\\_close\\_skills\\_gap\\_for\\_low-income\\_students.html](http://blogs.edweek.org/edweek/education_futures/2015/06/published_report_identifies_steps_to_close_skills_gap_for_low-income_students.html).
- ManpowerGroup. 2015. 2015 Talent Shortage Survey. ManpowerGroup. [www.manpowergroup.com/wps/wcm/connect/db23c560-08b6-485f-9bf6-f5f38a43c76a/2015\\_Talent\\_Shortage\\_Survey\\_US-lo\\_res.pdf?MOD=AJPERES](http://www.manpowergroup.com/wps/wcm/connect/db23c560-08b6-485f-9bf6-f5f38a43c76a/2015_Talent_Shortage_Survey_US-lo_res.pdf?MOD=AJPERES).
- OMB Communications. 2015. "Fact Sheet: Middle Class Economics: The President's Fiscal Year 2016 Budget." White House blog, February 2. [www.whitehouse.gov/blog/2015/02/02/fact-sheet-middle-class-economics-president-s-fiscal-year-2016-budget](http://www.whitehouse.gov/blog/2015/02/02/fact-sheet-middle-class-economics-president-s-fiscal-year-2016-budget).

- Palombo Weiss, R. 2015. "Bridging the Skills Gap: How Businesses Promote Educational Attainment." Senior Leaders & Executives blog, July 8. [www.td.org/Publications/Blogs/Learning-Executive-Blog/2015/07/Bridging-the-Skills-Gap-How-Businesses-Promote-Educational-Attainment](http://www.td.org/Publications/Blogs/Learning-Executive-Blog/2015/07/Bridging-the-Skills-Gap-How-Businesses-Promote-Educational-Attainment).
- Perez, T.E. 2014. "Remarks by Secretary of Labor Thomas E. Perez, National Fund for Workforce Solutions—Annual Meeting, Chicago, Illinois, June 19." United States Department of Labor. [www.dol.gov/\\_sec/media/speeches/20140619\\_Perez.htm](http://www.dol.gov/_sec/media/speeches/20140619_Perez.htm).
- PricewaterhouseCoopers (PwC). 2015. "Skills Gap Is Forcing CEOs to Change How They Hire People." PwC, June 4. <http://press.pwc.com/global/skills-gap-is-forcing-ceos-to-change-how-they-hire-people/s/e2c3c2e6-dd1c-412d-a594-1209e1153f74>.
- Pure Michigan Talent Connect. 2015. Career Jump Start. [www.mitalent.org/career-jump-start](http://www.mitalent.org/career-jump-start).
- Quick Start. 2014. "Keeping It Real: Quick Start Supports Booming West Georgia Companies." Summer newsletter. Vol. 16, No. 2. [www.georgiaquickstart.org/uploads/misc/QSNewsS14V16No2.pdf](http://www.georgiaquickstart.org/uploads/misc/QSNewsS14V16No2.pdf).
- Schatsky, D., and J. Schwartz. 2015. *Global Human Capital Trends 2015: Leading in the New World of Work*. Deloitte University Press. [http://d2mtr37y39tpbu.cloudfront.net/wp-content/uploads/2015/08/DUP\\_GlobalHumanCapitalTrends2015.pdf](http://d2mtr37y39tpbu.cloudfront.net/wp-content/uploads/2015/08/DUP_GlobalHumanCapitalTrends2015.pdf).
- Schawbel, D. 2014. "10 Workplace Trends for 2015." *Forbes*, October 29. [www.forbes.com/sites/danschawbel/2014/10/29/the-top-10-workplace-trends-for-2015](http://www.forbes.com/sites/danschawbel/2014/10/29/the-top-10-workplace-trends-for-2015).
- Schoenwetter, L. 2015. "Nurturing a Skilled Workforce Through Apprenticeships." U.S. Department of Labor Blog, February 12. <https://blog.dol.gov/2015/02/12/nurturing-a-skilled-workforce-through-apprenticeships>.
- Snyder, T. 2015. "Community Colleges and the Skills Gap." *Huffington Post*, February 24. [www.huffingtonpost.com/tom-snyder/community-colleges-and-th\\_2\\_b\\_6738110.html](http://www.huffingtonpost.com/tom-snyder/community-colleges-and-th_2_b_6738110.html).
- Stewart, T.A. 1995. "How a Little Company Won Big by Betting on Brainpower." *Fortune*, September 4. [http://archive.fortune.com/magazines/fortune/fortune\\_archive/1995/09/04/205887/index.htm](http://archive.fortune.com/magazines/fortune/fortune_archive/1995/09/04/205887/index.htm).
- Taco Comfort Solutions. 2015. "John Hazen White Jr." Taco Comfort Solutions. [www.taco-hvac.com/en/jhwjr.html](http://www.taco-hvac.com/en/jhwjr.html).
- Tedesco, E. 2013. "Managing the Virtual Workforce." *Infoline*. December. Alexandria, VA: ASTD Press.
- Torpey, E. 2014. "Got Skills? Think Manufacturing." Bureau of Labor Statistics, June. [www.bls.gov/careeroutlook/2014/article/manufacturing.htm](http://www.bls.gov/careeroutlook/2014/article/manufacturing.htm).
- Tyszko, J.A., R.G. Sheets, and J.B. Fuller. 2014. *Managing the Talent Pipeline: A New Approach to Closing the Skills Gap*. U.S. Chamber of Commerce Foundation, Center for Education and Workforce. [www.uschamberfoundation.org/sites/default/files/Managing%20the%20Talent%20Pipeline.pdf](http://www.uschamberfoundation.org/sites/default/files/Managing%20the%20Talent%20Pipeline.pdf).

UpSkill America. 2015. Small Group Summary Paper. White House Summit, April 24.

Weber, L. 2014. "Where Are All the Middle-Skill Workers?" *Wall Street Journal*, November 12. <http://blogs.wsj.com/atwork/2014/11/12/us-jobswhere-are-all-the-middle-skill-workers>.

Widener, N. 2013. "Quick Start Training Preps Workers for Caterpillar." *OnlineAthens*, May 25. <http://onlineathens.com/business/2013-05-25/quick-start-training-preps-workers-caterpillar>.

Yakusheva, O., R. Lindrooth, and M. Weiss. "Economic Evaluation of the 80% Baccalaureate Nurse Workforce Recommendation: A Patient-Level Analysis." *Medical Care*, 52(10): 864-869.

