



Facing the storm

Navigating the global skills crisis

Executive Report

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Weathering the skills storm

As regions worldwide experience economic, social and political disruption, public uncertainty has risen dramatically. Fueled by continued technological advances, traditional industry value chains and business models are morphing in unexpected ways and destabilizing traditional job roles. Employers are increasingly crippled by a workforce whose skills have not kept pace with changing requirements. If left unresolved, the global skills shortage will have profound effects on individuals and economies worldwide. How can business, education and government leaders work together to deepen the talent pool and equip the workforce with the skills today's organizations need?

The gathering storm

Digital technologies are fundamentally disrupting the business landscape. As technology opened the door to new ways of doing business, innovative operating and market strategies contributed to a blurring of industry boundaries and shifting of value chains. These dramatic transformations have had a profound effect on the types of workforce skills demanded by various industries.

To gauge current skills challenges and assess future needs, the IBM Institute for Business Value in cooperation with Oxford Economics surveyed more than 5,600 global executives representing 18 industries and 48 countries, including 800 leaders of government institutions and 1,500 from higher education institutions. (For more information, see the *Study approach and methodology* section.)

Survey responses reiterate the massive changes occurring across industries worldwide, as well as technology's influence on consumers. For example, 75 percent of global business, government and higher education leaders believe that customer buying behavior is shifting from a strictly product/service basis to an experience basis. Eighty percent indicate competition is coming from new and unexpected sources. And 67 percent say that traditional boundaries between industries are blurring as industries are reshaped. As a result, many business leaders believe business structures and processes need to change. In fact, 74 percent of leaders surveyed feel traditional business models are not sustainable in the current market environment.



60% of executives **struggle** to keep **workforce skills current** and relevant in the face of rapid technological advancement.



Only 55% of leaders believe the **current education system** in their country provides programs to ensure **lifelong learning and skills** development.

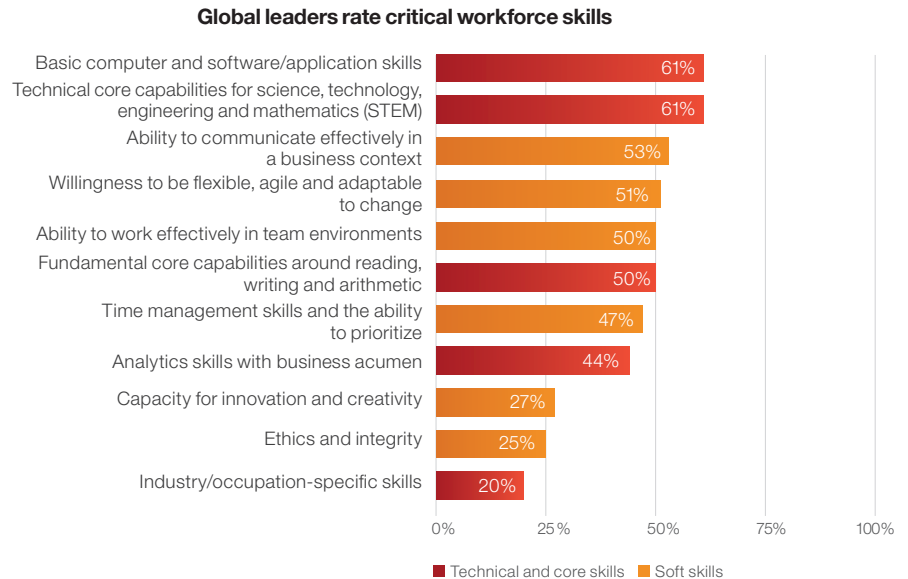


55% of leaders believe **inadequate investment** from private industry is the **most fundamental challenge** in addressing skill development issues.

And while technological capabilities remain at a premium, other types of skills – soft skills – are also becoming more valuable. As businesses face increased imperatives to transform and adapt to changing economic forces, core skills such as communication, flexibility and agility are in high demand (see Figure 1).

Figure 1

Critical skills are in high demand



Source: IBM Institute for Business Value 2016 Global Skills Survey.

We also asked respondents who or what entity they believe should take responsibility for developing workforce capabilities. Almost 80 percent believe that governments should bear the bulk of responsibility in developing and maintaining worker skills (see Figure 2). However, many government organizations have been overwhelmed by the extent and depth of the issue. In the face of geopolitical instability, demographic challenges, increased citizen services demands and economic constraints, government organizations are already challenged to do more with less.

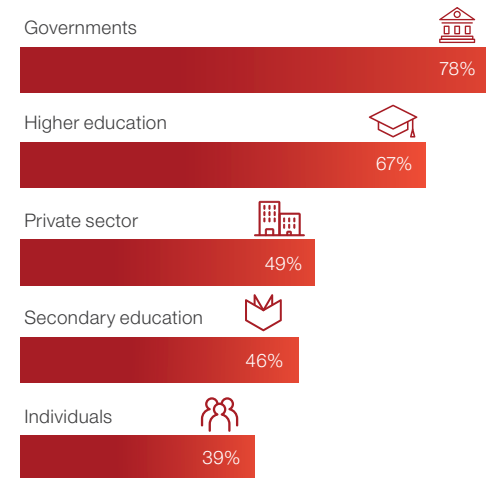
Respondents ranked higher education institutions second in order of responsibility. However, confidence in higher education's ability to solve the widening skills gap is underwhelming: Only half of the industry leaders surveyed believe secondary schools are adequately preparing students to be productive members of the workforce. And only 55 percent say that educational institutions adequately update curricula and programs to keep pace with industry changes.

Business leaders are no more impressed by their own ability to address the skills challenge. Only 51 percent of industry executives believe their organization's business culture supports employee career development. And as many as 55 percent of all executives surveyed conclude that inadequate investment from private industry is the most important challenge to overcome in addressing skills development in the future.

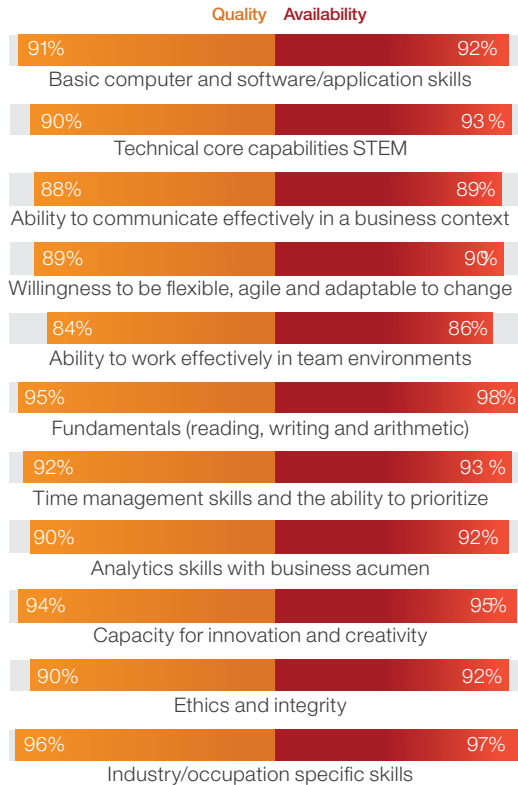
Despite their having arguably the most at stake, individuals were ranked last in order of responsibility. Only 39 percent of all executives surveyed believe individuals should have a significant responsibility in maintaining and developing their skills.

Figure 2

Who should be responsible for developing and maintaining the workers' skills?



Source: IBM Institute for Business Value 2016 Global Skills Survey.

Figure 3*Availability and quality of critical skills*

Source: IBM Institute for Business Value 2016 Global Skills Survey.

A house divided

Significant roadblocks to solving the growing skills crisis perpetuate. Complacency over the scope of the problem and major disconnects between stakeholder groups are evident across multiple regions. In addition, overconfidence in the ability to address core issues is striking – even among leaders in countries experiencing economic stagnation.

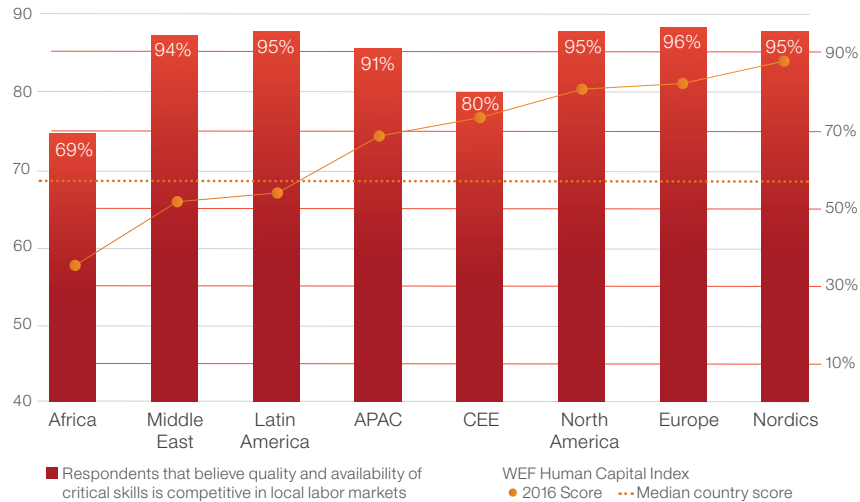
Half of the industry executives surveyed cite lack of appropriately skilled workers in local labor markets as the single greatest skills-related challenge. In addition, according to a 2015 IBM Institute for Business Value study on higher education, 71 percent of corporate recruiters indicate their greatest challenge when recruiting from higher education institutions is finding graduates with practical experience.¹ Paradoxically, when asked about quality and availability of critical skills, executives in our survey expressed great confidence (see Figure 3).

Executives in Western Europe and Nordics, North and South America, Asia Pacific and the Middle East are especially confident in their ability to obtain skilled talent. Confidence reported belies stark economic realities. Comparing survey responses with data from the World Economic Forum's 2016 Human Capital Index reveals major gaps – what could be thought of as complacency gaps – across much of the world (see Figure 4).²

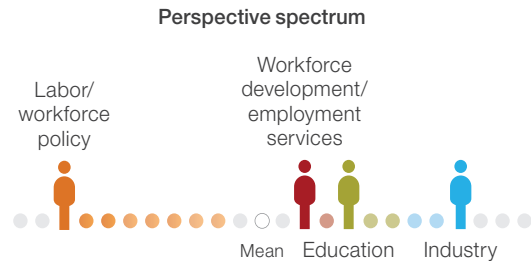
We were also interested in what, if any, cooperative efforts exist among stakeholders. While efforts are made by some respondents to collaborate with other major stakeholders, such attempts are by no means ubiquitous. Only 36 percent of industry executives surveyed report collaboration with public universities, and only 32 percent of higher education leaders report collaboration with the private sector.

Figure 4

Confidence or complacency? Skills perceptions versus objective reality



Source: IBM Institute for Business Value 2016 Global Skills Survey; Human Capital Index 2016, World Economic Forum.

Figure 5*Differing perspectives on skills issues – a variance analysis*

Source: IBM Institute for Business Value 2016 Global Skills Survey and IBM Institute for Business Value analysis.

We discovered that divergence of opinion between major stakeholder groups is stark, particularly relating to pertinent issues such as critical skills, quality and availability of existing skills, roadblocks to progress, economic implications, and responsibility for resolving challenges (see Figure 5).

Perspectives regarding what critical skills are required varied widely, with the widest variance between industry executives responsible for creating most jobs and workforce/labor policy executives influential in defining government labor market programs. Industry executives ranked science, technology, engineering and mathematics (STEM) skills; basic computing skills; and fundamental core skills in reading, writing and arithmetic as the most important. However, these skills were rated lowest in priority among workforce/labor policy executives worldwide (see Figure 6).

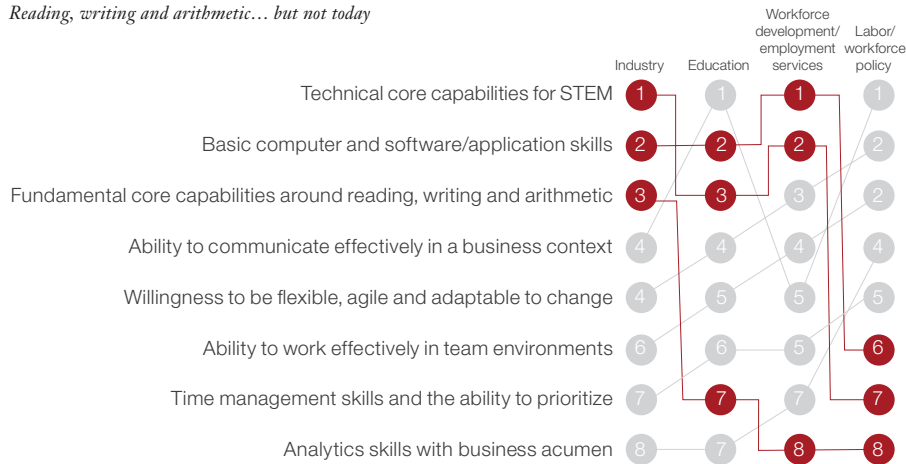
Similarly, with respect to barriers to improving workforce skills, both industry and education leaders identified lack of motivation among individual workers as second, while workforce/labor policy executives rated personal responsibility sixth and seventh respectively. And while industry executives rated inadequate government spending on workforce skills the third most important factor out of ten possible options, workforce/labor policy executives rated it last.

Major stakeholders agree that many employees lack critical business skills in activities such as team effectiveness and business communication; however, unanimity breaks down when it comes to which stakeholder group should carry the primary burden of addressing skills issues. Roughly half of industry and education executives believe the private sector should take responsibility. However, only 38 percent of workforce/labor policy executives and only 40 percent of workforce development/public employment services executives agree. One thing all groups agree on, however, is the centrality of government in addressing workforce skills issues.

We also discovered that workforce/labor policy executives doubt the effectiveness of higher education institutions to address what they perceive as a widening skills deficit. Only 47 percent believe that higher education is preparing students with the skills they need to be competitive, only 49 percent are confident that educational institutions use new technologies effectively to expand access and enhance learning experiences, and as few as 45 percent say that curricula and programs keep pace with changes in industries and economies. Industry executives, on the other hand, rank formal education's effectiveness significantly higher.

Figure 6

Reading, writing and arithmetic... but not today

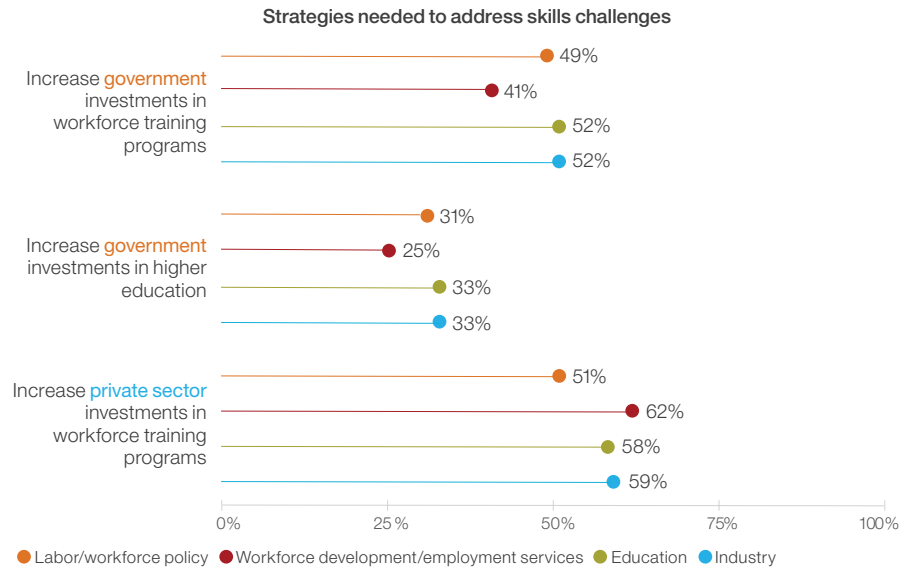


Source: IBM Institute for Business Value 2016 Global Skills Survey.

When considering strategies to improve the skills climate in their respective regions, a majority in each major stakeholder group agrees that private sector investment in training programs needs to increase – much more so than government investments in education. There was also concurrence by most executives that government should accelerate investment in workforce development programs, with the notable exception of workforce development/public employment services executives (see Figure 7).

Figure 7

Who's left carrying the ball? Strategies to address skills challenges



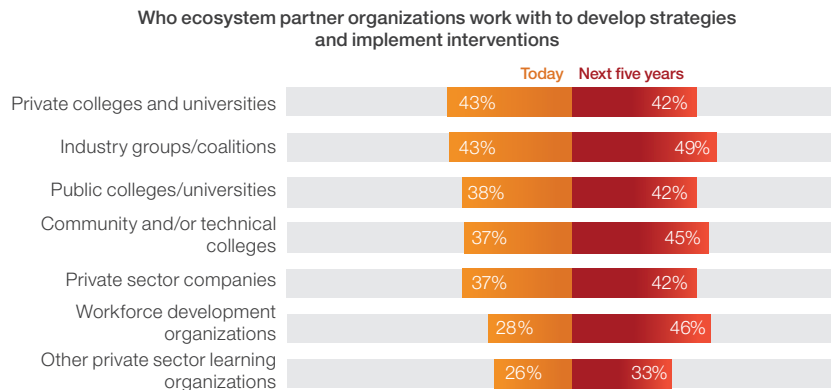
Source: IBM Institute for Business Value 2016 Global Skills Survey.

These numerous disconnects point to a need for improved communication and cooperation between stakeholders. Indeed, collaboration with ecosystem partners can afford benefits both for individual stakeholders and the economy as a whole. However, our survey reveals there is still work to be done in reaping the rewards of ecosystem engagement. While industry executives surveyed do foresee broader collaboration in the future, the overall commitment remains tepid (see Figure 8).

Tackling the global skills crisis requires a team effort in which all necessary ecosystem actors align to address the disconnects. With ecosystem partners working in tandem, industries will be better equipped to innovate at the level and intensity necessary to build and sustain job creation and competitiveness. In addition, economies will be better positioned to recruit and retain new industries, and individuals will be armed with the skills necessary for higher paying new jobs.

Figure 8

Who's talking now? Collaboration among ecosystem actors today and tomorrow



Source: IBM Institute for Business Value 2016 Global Skills Survey.

Building industry-leading collaboration

The Toronto Financial Services Alliance (TFSA) is a public–private partnership dedicated to making Toronto a “top-ten” global financial services center. Providing a collaborative environment in which the financial services industry, government and higher education can work together, TFSA has effectively built international awareness of Toronto’s advantages and contributed to investment and job growth in the financial sector. To further capitalize on the region’s advantages, TFSA established a Centre of Excellence in Financial Services Education, offering comprehensive financial services career advice and insight into emerging talent needs within the sector.⁴

Charting a new course

As industry, education, and government and public sector leaders join forces to build a robust global talent pool, we suggest each stakeholder group embrace three high-level strategies:

- Build regional ecosystems.
- Prioritize and invest in proven, innovative solutions.
- Enable and advocate for individual responsibility.

Build regional ecosystems

Building and engaging more effectively in business ecosystems – in addition to one-on-one relationships – can help all ecosystem partners more readily overcome barriers and accelerate establishment of new initiatives and innovation. Ecosystems involve complex webs of interdependent enterprises and relationships aimed at creating and allocating some form of business value. In a regional context, ecosystems might refer to strong or loose affiliations of businesses; educational institutions; local, state or national government entities; and other groups.³

Leading organizations recognize the benefits of active engagement in business ecosystems. For example, 69 percent of industry executives from outperforming companies (those that rank highest in terms of revenue growth and operating efficiency) indicate their organizations are already collaborating with ecosystem partners to address skills-related issues, as opposed to less than half of lower performing businesses. In addition, 84 percent of education executives surveyed believe that improving collaboration among ecosystem partners has already had positive impacts, and 79 percent of workforce/labor policy executives concur. And three of the top five strategies identified as most important by respondents relate to ecosystems and collaboration (the remaining two relate to private sector and government investments in training programs).

Next steps to build regional ecosystems

Regional ecosystem partners from **government, education** and **industry** must work together to:

- *Identify the right partners and empower orchestration:* Identify key partners from government, education and industry, and then define and empower a strong intermediary to recruit partners and build consensus.
- *Crystalize vision, define objectives and achieve commitment:* Define and agree on a common vision with clearly defined roles and commitments across ecosystem partners. In addition, establish business intelligence requirements, strategy and governance for addressing data collection and sharing among partners.
- *Formalize processes and sustainable design:* Formalize processes and accountability mechanisms to help ensure partners remain engaged and committed, and encourage partners to align internal business metrics to the ecosystem vision.

Accelerating regional development

The Tampa, Florida, region has seen significant economic growth, due in large part to collaboration between higher education and industry. For example, the University of South Florida (USF) actively engages with industry through its USF Research Foundation, which offers student career training, supports research and technology transfer, and provides information and resources.⁵ Another example is the Hillsborough Community College (HCC) Ybor City campus, which engages its community through a council of stakeholders from local businesses, government, neighborhood associations, corporate partners and educational institutions.⁶ In addition, the Tampa Hillsborough Economic Development Corporation (EDC), a public-private partnership that serves as the region's lead economic development agency, facilitates collaboration between education institutions and industry.⁷

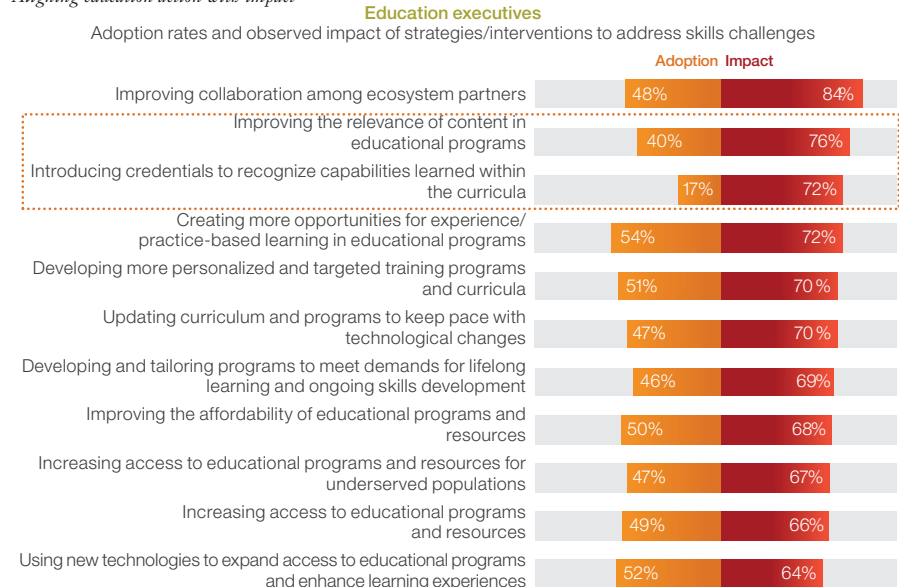
Prioritize and invest in proven, innovative solutions

Strangely, among education, policy and workforce development executives, there seems to be an inverse relationship between those initiatives identified as most impactful and initiatives actually adopted. The more impactful an initiative is, the less likely it is to be adopted. While concerning, this dichotomy points toward the need to prioritize new initiatives.

For education executives, for example, there is a 55 percentage point gap between perceived impact and actual adoption of credentials that recognize capabilities learned within curricula, and a 36 percentage point gap for improving content relevance (see Figure 9).

Figure 9

Aligning education action with impact

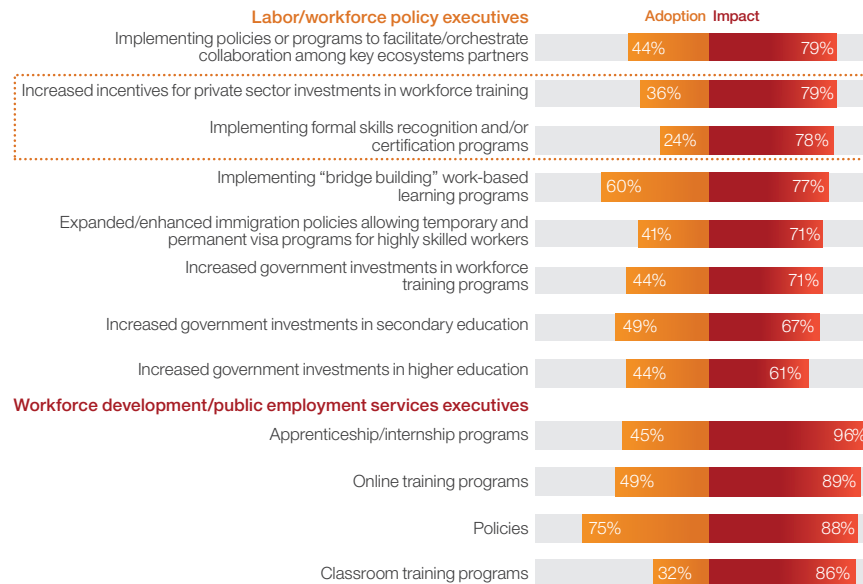


Source: IBM Institute for Business Value 2016 Global Skills Survey.

Similar gaps exist among workforce/labor policy executives and workforce development/public employment services executives (see Figure 10). Among workforce/labor policy leaders, there is a 54 percentage point gap between perceived impact and adoption for implementing formal skills recognition and certification programs, and a 43 percentage point gap for increasing incentives for private sector investment in workforce training. For workforce development/public employment services executives, policy success appears to be undermined by low adoption rates for practical solutions.

Figure 10

Reconciling policies and programs with practice



Applied learning geared for career success

Daimler, one of the world's largest producers of premium luxury cars and commercial vehicles, collaborated with the German government and educators to develop an apprenticeship program to prepare students to work in one of the company's many facilities. More than 2,000 apprentices from across Germany participate annually in the Daimler program, which includes both classroom and on-the-job training. Nine out of ten apprentices go on to land permanent positions, while others could be offered short-term contracts.⁸

Building effective models that scale

The Pathways in Technology Early College High Schools (P-TECH) model integrates high school, college and workplace learning. Upon completion of a six-year program, students can earn both their high school diploma and an industry-recognized two-year post-secondary degree. Students are paired with industry mentors and participate in work site visits and project days, as well as skills-based, paid internships. Successful graduates are first in line for jobs with their industry partners. Launched in 2011 in Brooklyn, New York, the model is expected to grow to 60 schools by the end of 2016, with plans for global expansion.⁹

Next steps to prioritizing proven, innovative solutions

Government leaders should assess opportunities to adopt strategies proven to be impactful by other government leaders globally, including:

- Working with industry and ecosystem partners to create and expand apprenticeship/internship programs
- Providing incentives for private-sector investments in workforce training
- Implementing formal skills recognition and/or certification programs
- Implementing “bridge building” work-based learning programs
- Expanding/enhancing immigration policies to allow for temporary and permanent visa programs for highly skilled workers.

Education leaders should consider adopting strategies proven to be impactful by other education leaders globally, including:

- Improving relevance of content in educational programs
- Introducing credentials to recognize capabilities learned within the curricula
- Creating more opportunities for experience/practice-based learning in educational programs
- Working with industry to update curriculum and programs to keep pace with technological change.

Industry leaders should identify opportunities to partner and work with government and other ecosystem partners to create and expand apprenticeship/internship programs and implement formal skills recognition and/or certification programs.

Enable and advocate for individual responsibility

The majority of all executives surveyed do not believe individuals should bear a significant responsibility in developing and maintaining their skills. Perhaps this is because they lack confidence in individuals taking responsibility for their skills futures. Forty-four percent of respondents believe a lack of individual motivation to proactively update and improve skills is one of the most fundamental challenges of skills development.

However, little confidence exists that education systems are up to the task. Only 55 percent of executives surveyed believe the current education system in their country provides programs to ensure lifelong learning and skills development. And though industry executives indicate they struggle with long-term skills development of employees, addressing the issue is not a high priority. Only about half of industry executives indicate that career development support is a part of their organization's business culture. Meanwhile, 55 percent indicate maintaining skills currency of long-term employees is one of their greatest challenges.

So, if individuals don't take responsibility for their own skills destiny, who will? Individuals cannot rely solely on governments, employers or educational institutions to plan their career paths and ensure they receive the education and training required to remain competitive over the course of their lives. This is just not feasible. Individuals need to take control of and responsibility for their careers and lifelong learning paths. About learning new skills, Randall Stephenson, AT&T's chairman and chief executive, stated in a New York Times interview, "There is a need to retool yourself, and you should not expect to stop."¹⁰

But individuals cannot do it alone. They must be enabled with tools and opportunities to chart their work future and continuously update skills throughout their life. Public and private sector organizations should focus on programs that enable individuals to chart their career courses and provide them with tools and information to make informed skills-development decisions.

Ongoing education investment

Bison Gear and Engineering Corporation, a power transmission equipment company based in St. Charles, Illinois, provides a range of opportunities to new and existing employees to develop and advance their skills. In addition to collaborating closely with local community colleges and universities on workforce planning and curriculum development, Bison has implemented multiple programs to provide clear pathways and cost reimbursement for employees wishing to pursue industry-recognized accreditations or advanced degrees.¹¹

Personalized learning for sustaining a career

MARi is a personal learning platform that enables individuals to identify and navigate appropriate education paths, occupations and job opportunities. Functioning like a “personal learning GPS,” the MARi system quickly assesses an individual’s academic credentials and career skills and maps the fastest personalized path to achieve the desired outcomes. MARi provides freemium services to academic and non-profit partners and offers solutions for employers that let candidates match themselves to job requirements.¹²

Personalized learning has long been a goal for educators. Advancements in sophisticated analytics and cognitive computing have driven progress toward this goal. Data-driven cognitive technologies can enable personalized education – allowing individuals to more readily take responsibility for their skills future and improve outcomes for stakeholders across the skills ecosystem.

Next steps to enable and advocate for individual responsibility

- **Industry and education** leaders should pursue opportunities to leverage advanced technologies, such as personal learning assistants, to develop more personalized, targeted training programs and curricula that support and enable lifelong learning.
- **Industry and education** leaders should actively promote and educate individuals – both employees and students – about the importance of lifelong learning and ongoing skills development.
- **Industry and education** leaders should pursue partnerships and opportunities to make educational programs relevant, accessible and affordable for all individuals.
- **Government** leaders should explore leveraging advanced technologies to enable personalized learning in workforce development programs and providing incentives for regional industry and education partners to develop programs and capabilities that enable lifelong learning.

Conclusion

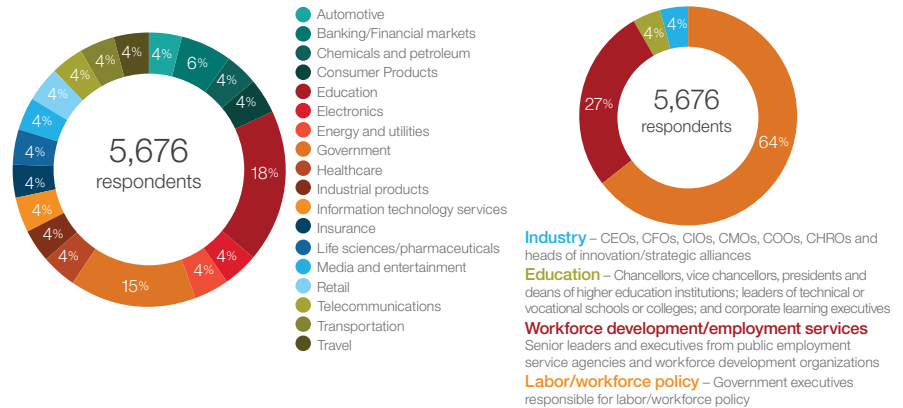
Global economies are at a crossroad. As industries are redefined, so too are the types of skills they require. The available labor force can either help accelerate or constrain economic evolution and growth. How educational institutions, private businesses, government and employees themselves respond will determine whether this evolution results in sustained economic malaise or economic prosperity.

- What is your organization's strategy for ensuring skills currency and the competitiveness of your workforce?
- How is your organization working to implement proven strategies and interventions to improve skills outcomes in your region?
- To what degree is the education system in your region providing practical and applied educational opportunities?
- How are new technologies being leveraged to enable personalized learning for individuals in your region or organization?
- How engaged and coordinated are ecosystem partners in your region or industry?

Study approach and methodology

In cooperation with Oxford Economics, the IBM Institute for Business Value surveyed 5,676 global executives representing 18 industries and 48 countries, including 967 from North America, 657 from Latin America, 1,372 from Western Europe, 408 from Eastern Europe, 440 from the Middle East, 400 from Africa, 611 from South and South East Asia and the Pacific, 410 from China and 411 from Japan.

Among the 5,676 were 830 leaders of government institutions (including 255 leaders from workforce development/public employment service agencies and 255 workforce/labor policy executives) and 1,505 leaders of higher education institutions (including 609 from technical or vocational schools or community colleges). Average revenue or budget of organizations surveyed was approximately USD 3 billion.



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