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ARTICLE



# The evolution of the workforce during the fourth industrial revolution

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## ABSTRACT

In the first quarter of the twenty-first century, society has embarked on a period of dramatic transformation, often described as the fourth industrial revolution (4IR). It is characterized by the proliferation of increasingly complex technologies that are bringing together the physical, digital, and biological worlds (e.g., 3D printing, robotics, and the internet of things). Collectively, these capabilities are having an impact on all sectors of the economy and challenging existing social systems. The result is a fundamentally new period for human life and societal institutions. This research sought to explore the implications of the fourth industrial revolution (4IR) on the workforce, with a specific focus on the reskilling required to prepare for the future of work. By engaging leaders across the private sector, educational institutions, government organizations, and those playing a cross-sector role (e.g., public-private partnerships), this research explored the key challenges and areas of opportunity associated with new workforce skill development.

## ARTICLE HISTORY

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## KEYWORDS

Fourth industrial revolution; future of work; workforce readiness; workforce reskilling; workforce upskilling; workforce transformation

## Introduction

In the first quarter of the twenty-first century, society has embarked on a period of dramatic transformation, often described as the *fourth industrial revolution* (4IR). It is characterized by the proliferation of increasingly complex technologies that are bringing together the physical, digital, and biological worlds (e.g., 3D printing, robotics, and the internet of things) (Briggs and Buchholz 2019; Schwab 2016; Schwab and Samans 2018). Collectively, these capabilities are having an impact on all sectors of the economy and challenging our social systems. The result is a fundamentally different period of societal change that extends in size and scale beyond previous periods of industrial revolution (Schwab 2016; Schwab and Samans 2018).

This research sought to explore the implications of the 4IR on the workforce, with a specific focus on the reskilling required to support the future of work in a new era. Given the unprecedented pace and complexity of these changes, there is a disproportionately small amount of research as of yet that can inform professionals operating within Human Resource (HR) disciplines, or to direct mid-to-long term public policy. By engaging audiences across the private and public sector, from educational institutions to for-profit businesses, this research explored the challenges and areas of opportunity in preparing the next generation for a new workplace. The study focused on

how leaders in the business, educational and government sectors can best support the societal transition. Three research questions were explored:

- RQ1 – How do leaders across the economy perceive the workforce requirements of the fourth industrial revolution (4IR)?
- RQ2 – How are leaders of institutions in the private sector, educational system, and government responding to and supporting the changing nature of work?
- RQ3 – How do leaders see the field of adult education evolving to prepare and support the workforce effectively?

While a considerable amount has been written about the 4IR and the future of work, very little research thus far analyzes the specific solutions that are having the most impact. Ultimately, the goal of this research was to bring greater attention to collaborative solutions across the business, government and educational communities that are impactfully preparing workers for roles required in the 4IR, while simultaneously inspiring fellow researchers to expand on the findings in the years ahead.

## **Review of the literature**

In an increasingly technology-driven world of smart devices, quantum computing, and autonomous vehicles, significant changes are taking place which are challenging long-standing assumptions about the very nature of work and the roles that humans will play in the workforce of the future (Schwab 2016; Manyika 2017). While research into the future of work and requirements for the workforce is still nascent and evolving, existing literature suggests that work activities, skill requirements and labour pool composition will be significantly different as a result of the current societal changes underway. While previous industrial revolutions have also been characterized by work activity automation, the pace of this change in the 4IR is occurring at an unprecedented rate (Schwab 2016; Manyika 2017). Many businesses, educational and government organizations are struggling to evolve, while fervently competing for an increasingly limited pool of talent equipped with the requisite twenty-first-century skills (Rudel and Hooper 2005; Adams 2014). What more should businesses be doing to prepare for the future? How can educational and government agencies each address the learning requirements of the modern workplace?

## **Globalization**

Globalization continues to be a significant driver of change to both the nature of work and workforce skill requirements (Manyika 2017). Access to diverse, lower cost labour and supply chains have led more advanced economies to offshore or outsource a large share of productive activity – and therefore jobs – in the 4IR. When these jobs move countries, this is considered offshoring; when moved to other organizations, this is outsourcing. Both carry the explicit benefit of lower labour costs, providing individual businesses with enhanced market share and profit (OECD 2017).

## **Automation**

In parallel to the trend around globalization has been the continued maturity and sophistication of business process automation technologies that systematize repetitive work activities. The OECD (2017) projected that with the growing power of business process automation (e.g., robotic process automation or RPA), employers would continue to de-bundle jobs into smaller tasks, allowing work to be carried out more efficiently on a global, digital assembly line. Tasks that are lower value-added would be sent offshore, outsourced to lower-cost service providers or increasingly automated through software. At the higher end of the business process value chain, emerging cognitive technologies like machine learning (ML) and natural language processing (NLP) are increasingly being used to supplement human work activity. The combination of automation and cognitive technology adoption is leading to increased human-machine collaboration, with machines performing an even greater proportion of productive work activity globally (Briggs and Buchholz 2019; Manyika et al. 2017). This new reality has raised important questions regarding the kinds of activities humans will need to perform in the coming decades and the kinds of skills that will be required as a result.

## **The workforce skills debate**

For the last two decades, skill preparation literature has stressed the importance of building Science, Technology, Engineering, and Math (STEM) skills to develop the workforce of the future. Other thought leaders have challenged this premise, emphasizing the importance of ‘soft skills’, including collaboration, teaming, ethical judgement, and communication (AACC 2018; Ferreri 2018; Hartley 2017; Stolzoff 2018). Snow (1959) initially spoke of this distinction in the 1950s when he observed that the intellectual life of the western world was split into two cultures – namely, the sciences and the humanities – and that this split was a significant hindrance to solving the world’s problems (Zakaria 2015). Complicating the 4IR skills debate are examples of successful technology startups that prioritize technical skills over other capabilities. In doing so, these organizations and their leadership teams risk having the breadth and diversity necessary to compete in a complex operating environment (e.g., capabilities that balance technical aptitude and arise from familiarity with civics, political science, and psychology) (Hartley 2017; Strauss 2017; Zakaria 2015).

As competition for talent with the necessary twenty-first-century skills increases, research has indicated a growing concern among employers for the widening of their workforce’s capabilities (Bessen 2014; Miller 2014; Moore and Morton 2017). Equally under debate is the readiness of public and private constituents (e.g., educational institutions, custodians of public policy) for preparing the workforce. As the 4IR eliminates some roles, millions of new roles become available through the use of new technologies (e.g., humans working alongside algorithms to make more informed decisions) (Brende 2019; Frey and Osborne 2013; Manyika et al. 2017). This would mimic similar trends of recent decades with the emergence of new roles working alongside technologies that never existed previously.

## ***Changes in the nature of work***

The combined influence of globalization, increased business process automation, and the use of cognitive technologies within the workplace have all led to a transformation in the nature of work. Workforce skill dialogues have held that STEM would effectively prepare workers for future employment needs (USDOE 1983). However, recent thinking has elevated softer skills like communication, collaboration, and critical thinking to be equally in demand during the 21<sup>st</sup> century (AACC 2018; Ferreri 2018; Stolzoff 2018). The response to this demand in the educational community has been mixed. While some educational institutions are innovating in program design and expanding the number of learning opportunities available, many are struggling to keep pace or address the breadth of capabilities required (Cardenas-Navia and Fitzgerald 2015; Singer 2019). This has led to a lack of confidence that the current educational system is adequate enough to prepare workers for the 4IR (USDOE 1983; National Academies 2007; Cardenas-Navia and Fitzgerald 2015; Singer 2019). Furthermore, the 4IR literature suggests a lack of confidence that local, state and federal government agencies can effectively leverage public resources in order to prepare workers for the needs of the new economy. This has led to a growing skills gap and demand for learning on-the-job within the organizational settings in which people find themselves (Schwab 2018; Schwartz et al. 2017, 2019).

## **Methodology and research approach**

To validate the literature, the researcher team utilized a qualitative case study design to garner input from leaders representing: (a) the business community, (b) higher educational institutions, and (c) government agencies. Twenty-three participants (23) were selected, each possessing at least a decade of professional experience addressing workforce skill development/re-development. Participants were also selected for their accessibility and were all part of the research team's professional network.

Data collection involved two tools: a 17-question, predominantly multiple-choice survey questionnaire, and a more in-depth semi-structured interview consisting of 12 questions and follow-up prompts. Researchers utilized the survey questionnaire to categorize and classify the 23 participants (e.g., the size of the institution they represented, the global vs. local nature of their focus). The survey questionnaire was based on similar surveys utilized by research organizations, such as the World Economic Forum, McKinsey Global Institute, and Deloitte Insights, each of which has explored this topic. A subset of 10 of the 23 participants in the survey questionnaire were then selected for 60-min semi-structured interviews. This subset of 10 participants were selected based on timely availability, and sector representation, to ensure government, education and business perspectives were all contributing to the more in-depth dialogue.

Establishing a coding scheme was relatively intuitive, given themes highlighted in the literature – for example globalization, automation, reskilling and current educational gaps – were readily present in the survey questionnaire results, and then consistently cited during interviews. The primary coding schema was descriptive coding (e.g., identifying key themes like disruptive technology, cross-sector partnerships) and in vivo coding (e.g., utilizing the interviewees' own language to catalogue key concepts).

The sample population of 23 was selected based on two criteria: (a) accessibility to the research team, namely within their professional network and willing to participate within a three-week timeframe; and (b) seniority and experience level, requiring participants to have at least 10 years' experience leading workforce reskilling efforts. The research team looked at demographic data across three key dimensions: (a) sector (e.g., for-profit business, educational institution or government agency with public policy responsibility), (b) geography (Americas, Europe, the Middle East & Africa (EMEA) or Asia Pacific (APAC)), and (c) institution/workforce size (e.g., 50 to 50,000). Forty-four per cent of the population (10 participants) represented the business sector, followed by 26% from educational institutions (6 participants) and 22% from cross-sector organizations (5 participants); only 9% represented government agencies (2 participants). Seventy-eight per cent of participants (18) were based in the Americas, with the 22% of remaining participants (5) representing the Europe, Middle East, and Africa (EMEA) and Asia Pacific (APAC) regions. Seventy per cent of the sample population (16 participants) worked in sizable institutions with over 1,000–50,000+ employees (see Figure 3).

This research intentionally utilized a methodology that combined both quantitative classification and categorization techniques with more qualitative data collection to not only validate the literature but explore the more nuanced perceptions and assumptions of leaders with direct responsibility for stewarding the future. Through the more quantitatively driven survey questionnaire, similarities, differences and trends across the sample could be compared and contrasted. In tandem, through the more qualitatively driven interview protocol, individual leader experiences, assumptions and practical solutions could be discussed in greater detail and nuance.

## Findings

Findings provided insight into the original research questions, helping specifically answer: (RQ1) how leaders are perceiving the workforce requirements of the 4IR, (RQ2) how they are leading their institutions to respond to these emerging needs, and (RQ3) how they see the field of education evolving to prepare the workforce effectively. Overall, there was a sense of optimism from leaders involved in this study around the future of work, despite shortages in skill sets and the continued rapid pace of automation and advances in cognitive technologies that at least in the short term appear to be replacing the human workforce. Additionally, leaders unanimously agreed that the business community is currently leading the workforce reskilling effort, with less leadership shown by government or educational institutions. Almost all participants also believed the existing educational system is not capable of supporting current or future requirements without fairly dramatic overhaul. Ultimately, the consensus from leaders involved in this study was that reskilling will require a cross-sector approach that is more dynamic, less siloed and more representative of society at-large.

### ***Finding 1: there is overall optimism around the future of work, despite shortages in skill sets and the rapid expansion of automation and advances in cognitive technologies***

There is optimism among leaders across institutions and sectors for the future of work and what it means for the evolution of human productive activity. This optimism is in spite of

recognized current skill shortages and the growing replacement of traditional work activities with automated software and cognitive technologies (like machine learning and artificial intelligence) (Cardenas-Navia and Fitzgerald 2015; Frey and Osborne 2013). Thirty-five per cent of respondents (8 participants) somewhat agreed that leadership is prepared to guide the organization through the 4IR. This optimism stems primarily from a historical appreciation for how powerful past technological advances have been for humanity, not any particular actions leaders are actively demonstrating (Schwab 2016; Brende 2019). The leaders interviewed indicated that we are at the early stages of appreciating the significance of the transformation underway but agreed it will be dramatic and will greatly improve the quality of human life, including freeing human capacity, time, and energy for less mundane, repetitive, manual activities. One business executive explained, ‘the future of work is not so much about robot versus human, but it’s robot and human’. Another educational leader described the digital and cognitive technology revolution as ‘the industrial revolution from the nineteenth century on steroids’, exponentially transforming how everything from transit to healthcare, finance to politics transpires. While the details of how the human-machine collaboration model within the workplace will evolve are unknown, participants from all sectors expressed a sense of enthusiasm and momentum for its potential to improve the quality of human life, while improving the notion of human productivity and work (Briggs and Buchholz 2019; Manyika 2017; Manyika et al. 2017).

### ***Finding 2: local, national, and global leadership readiness is low***

According to participants in this study, there is a relatively low state of readiness among local, national, and global leaders to prepare for and respond to the vast socioeconomic changes that the 4IR is bringing. As one leader indicated, ‘there’s a lack of urgency in this conversation’. While pockets of cross-sector collaboration exist, the overall pace of change is largely being set by a few large players in key industries across the corporate sector. This situation is exacerbated by the existing limitations in cross-sector planning, partnership, and engagement between the public sector and higher educational institutions (Brende 2019; Moore and Morton 2017). Responses indicated a general lack of confidence in current leadership to address workforce readiness challenges. Most respondents noted a certain ambivalence that their own leadership teams were prepared to guide their organizations through the 4IR: 30% disagreed that their leadership teams were prepared (7 participants) while another 30% (7 participants) noted they were neutral about their leadership team’s preparedness. However, despite these perceived leadership gaps, there was also a consistent theme that we’ll find a solution ‘because that’s in our DNA’.

### ***Finding 3: business is leading the workforce reskilling effort, yet individuals in the workforce need to own some of the responsibility to stay relevant***

Forty-three per cent of the leaders involved in this study (10 participants) indicated that the business community is leading the reskilling effort. Businesses increasingly see themselves as platforms, connecting ideas, people, space, and technology toward increasingly complex goals (Friedman 2016). These platforms cross traditional sector lines and blur the historic boundaries of supply chains and vendor relationships, to create truly



integrated networked capabilities (e.g., Amazon or Alphabet) (Briggs and Buchholz 2019; Rudel and Hooper 2005). At the same time, many of these organizations view themselves as having a partial social mission to empower their current and future workforce to make an impact in the world (e.g., Deloitte, JPMorgan Chase & Co.). As one business executive from a leading management consulting firm shared ‘we steward degree programs, we have reciprocal relationships with some schools where we hire a certain % and also send our practitioners back to grad school there. We’ve also done some targeted things, like partnered on a new ethics program at Notre Dame to address a gap we saw in the marketplace’. This trend toward ‘purpose-driven’ organizations means businesses are investing in talent and building the workforce of the future in unique ways, for example, through a reinvestment in the ‘corporate university’ welcoming thousands of employees and clients each year for targeted learning, networking, and growth.

Leaders reinforced that the half-life of skills is a matter of months when it once was years, and while businesses are playing a key role there is also a level of individual accountability to remain aware and accountable for staying relevant. Job reskilling cannot solely rest on the shoulders of the employer with any lasting success. While businesses are leading the investment in creative approaches toward learning and development, those individuals who succeed during this period of change will have an inner drive and sense of ownership for embracing the future (Bessen 2014; Miller 2014; Stolzoff 2018; Strauss 2017). As one educational leader shared ‘learning will play a critical role in this process’ and as another indicated ‘the best piece of advice or insight that I could offer is to read or learn about new topics as a daily habit’.

***Finding 4: educational institutions, and the current design of the existing end-to-end education system, is not capable of supporting current reskilling requirements***

Leaders in this study broadly recognized that the educational system in its current form is failing to deliver necessary capabilities at the pace and scale required to support current demand in the 4IR (AACC 2018; Hartley 2017). Thirty per cent of the respondents (7 participants) identified that the outdated educational system is the greatest concern for the foreseeable future. One leader went further to emphasize that ‘we have issues with the efficacy of these institutions overall in solving problems systematically’. Specifically, there are gaps in the skill sets of those performing the roles of educator, instructor, and facilitator. If those performing the teaching are not well equipped to support the teaching of modern twenty-first century skills, then those they are empowering will not find themselves prepared.

There are also fundamental flaws in the structure of primary and secondary education, with students sitting in a physical classroom 8 hours a day for the first 18 years or so of life. Participants cited how the U.S. educational system in particular continues to struggle, as evidenced by its steady decline in the global rankings on key educational metrics (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine (National Academies) 2007; USDOE 1983). However, the issue is larger than just a U.S. educational system challenge. Study participants suggested students globally are not being properly equipped with the skills that the economy suggests are most in demand. The biggest issue is a broken conceptual orientation toward how education works in an age of digital everything, everywhere (Bessen 2014; Strauss 2017). As one



educational leader shared, ‘I’m fortunate to not be stuck in a legacy system with a lot of faculty who are emotionally and financially tied to certain classes that they want to still run after 20 years yet are no longer current or interesting’. Educational systems have historically been constructed through years’ worth of time and investment. Leaders suggested these lengthy cycle times for ‘learning’ may be outdated in an age of virtual reality, machine learning, and artificial intelligence.

***Finding 5: reskilling remains a significant challenge as well as an opportunity that is broader than any particular sector and requires cross-functional partnership***

Study participants suggested that addressing future workforce requirements is a complex issue requiring systemic solutions that are larger than any single organization or sector and require traditional institutions to redefine how they provide services (e.g., public policy) (Brende 2019; Schwab 2016). Thirty-nine per cent of respondents (9 participants) reported that partnerships underway across sectors are too limited in scope to have any substantial impact. The literature also supported data collected as part of this study’s sample population, namely that society is at a pivotal period where traditional custodians for workforce redevelopment are no longer capable of addressing the breadth and complexity of these challenges, therefore demanding more modern, democratic, responsive solutions (Ferrerri 2018; Rudel and Hooper 2005).

Although experts have forecast an overall increase in jobs, considerable workforce displacement will also accompany these changes, raising important questions about what must be done to support the employability and economic well-being of displaced workers. As one leader shared, ‘from an economic point of view, I think re-skilling is going to be a big issue . . . if you look at venture capital where there’s tons of money being invested recently, it’s all around AI, and blockchain, and big data, and finding ways to power all these new disruptive technologies’. The interviews confirmed awareness of the coming shifts, with mixed responses that ranged from rationalization to personal uncertainty. Industry experts are increasingly gaining insight into the scale and scope of the workforce shifts as a result of the 4IR; however, the solutions remain unclear.

**Conclusions & recommendations for future research**

The purpose of this research was to gain insight into leaders’ perceptions of changing workforce requirements during the 4IR; bringing greater attention to the opportunities for HR professionals to drive greater collaboration across the business, educational and government sectors to prepare workers. The researchers also hoped to inspire fellow practitioners and academics to expand further on the findings. Key conclusions can be thematically grouped by the original research questions.

***RQ1 – How do leaders across the economy perceive the workforce requirements of the fourth industrial revolution (4IR)?***

While leaders indicated we are currently at the early stages of significant transformation in many, if not all, facets of human life – changes that they optimistically believe will dramatically improve quality of life – responses indicated a general lack of confidence in

current leadership approaches to address the scale and scope of workforce readiness. Despite perceived leadership gaps within their respective sectors – be it business, education or government – leaders are determined to find a solution; both a formal solution within their current organization and through cross-sector partnerships with other less obvious constituents.

Greater emphasis will be placed on reskilling and lifelong learning as the demand for select workforce skills far outpaces supply. Shifts are emphasizing the importance of knowledge-based work and favouring nonroutine, cognitive skills, such as problem-solving, imagination, creativity, communication, and collaboration. In this context, education and training become a continuous process throughout life, involving training and retraining that continue well past initial entry into the labour market. As automation and cognitive technologies change the fundamental nature of work, there is a need to strategically leverage learning at every level – the individual, team, organization and entire system. Humans will fill the roles that remain, which are more complex and nuanced, and require collaboration with emerging technologies in a symbiotic manner.

While it was evident from the study that the leaders whose organizations are directly involved in driving transformation during the 4IR are putting thought into how reskilling factors into their strategic plans, systemic, scalable solutions remain limited. Large-scale shifts in the workforce have both upstream and downstream impacts that require robust solutions which extend beyond corporate boardrooms. Educational institutions and government organizations have an important role to play in developing a range of integrated reskilling solutions and will therefore need to be much more proactive.

Businesses are leading reskilling efforts with the most innovative solutions and will remain a catalyst for continued workforce transformation. There has been substantial change in the motivations of for-profit organizations toward longer-term, purpose-driven, sustainable values. In part, this is being driven by generational expectations, as top millennial talent prioritizes making an impact. Additionally, the inevitable tolerance for risk within business allows for more acceptance of trying and failing, pivoting, learning, and growing. This approach toward innovation will be critical to infuse into rethinking the field of education, in ways that are similar to how other sectors are being disrupted – for example, transportation (ride sharing, autonomous vehicles) and manufacturing (3D printing, robotics).

## ***RQ2 – How are leaders of institutions in the private sector, educational system, and government responding to and supporting the changing nature of work?***

The private sector increasingly sees itself as a platform to connect ideas, people, space, and technology towards increasingly complex goals. Leaders see cross-sector partnerships as essential to addressing the skills gap, which no individual institution or industry has been able to address on its own (Friedman 2016). Groups like the Business-Higher Education Forum, an intermediary that works with government, business, and nonprofit organizations to stress proficiency in data science and analytics, were cited as examples of the kinds of collaborative efforts that create bridges and platforms of capabilities which are required in the 4IR (Cardenas-Navia and Fitzgerald 2015).

Yet currently, many sectors are still operating in silos. The literature and research suggest that the kind of transformation underway in the 4IR necessitates networks that

are effectively interconnected, with all stakeholders (suppliers, providers, customers, shareholders, etc.) forming an integrated web. Therefore, solutions to the workforce skills gap from HR professionals and other leaders intending to address this challenge will similarly require breaking down historical boundaries and creating new incentives for partnerships within and across departments (e.g., HR department towers), lines of business, organizations and industries. This extent of systemic collaboration will need to extend across the education, government and for-profit business community. Examples in the marketplace of success where traditional siloes have been broken down to create platformed ecosystems that create new skill sets and capabilities for a new future of learning and work, offer an indication of what is possible. It demonstrates that collectively, leaders across sectors can create a shared, compelling vision to support people as we increasingly work alongside machines in increasingly complex and novel ways.

### ***RQ3 – How do leaders see the field of adult education evolving to prepare and support the workforce effectively?***

At the start of a new era, where human-machine interaction plays an even more prominent and pervasive societal role – from healthcare to transportation, financial services to retail – leaders felt that an understanding of the evolution and future of human learning and development was paramount. The literature and research conducted as part of this study suggested that human-machine collaboration will evolve to become even more symbiotic, and that education therefore, needs to equally adapt to support growth in a manner that acknowledges and leverages the increasing sophistication of cognitive technologies like augmented and virtual reality, machine learning and artificial intelligence.

Leaders were adamant in suggesting that the educational system – which they strongly believed has not addressed the growing skills gap effectively over the past decade – requires dramatic change to produce the kind of scaled learning outcomes required in the twenty-first century. The rapid pace of societal change in the 4IR highlights the need for on-demand, timely, and fluid workforce growth and development. Technology-mediated learning, for example, through augmented and virtual reality, provides one example of promising tools for immersive learning experiences. These unique ways of re-conceiving education, however, are only happening in small pockets, and the solutions have yet to become systemic.

Reconstructing the educational system is required to address the growing gap between what society needs humans to be capable of doing, and what they are in fact able to do – if for no other reason than for individual institutions and nations to remain competitive, with thriving economies. Yet this level of social change is significant and will take considerable time, attention, and investment. Although transpiring after this study was conducted, the global Covid-19 pandemic which emerged in late 2019 and continued into 2020 has forced most of the world's population to remain in the equivalent of quarantines and lockdowns. This provided an opportunity to see first-hand how effective the use of existing technologies could be to change the way work and education transpires on a truly global scale. In some ways it has proven to be a success (e.g., with virtual collaboration tools successfully deployed at scale), yet there is ample evidence emerging from this one recent example that amplifies the need for dramatic reform in how we learn and work as we embrace the 4IR.

With the extent and scale of societal transformation clear, leadership vision, foresight, planning and investment will be paramount to creating the momentum and direction. HR professionals and other leaders with vested interest will be required to ensure that when we reflect on the next generation, we are not discussing a noticeable skills gap, but instead acknowledge the profound additional capabilities they've developed in the new world of work, collaborating with cognitive technologies and machines in new ways.

### **Closing remarks**

Findings from this study highlighted a number of challenges leaders are facing as they steward the workforce transition required during the 4IR. This offers ample areas for exploration, involvement and support from HR leaders. Challenges noted include the preparedness of talent for the type of work in-demand, failures of traditional support systems – like educational or government institutions – to address the current situation, and the absence of effective cross-functional partnerships. Despite these challenges, there is an overall sense of optimism among leaders around the future of work and the potential for all involved. The result for HR researchers and practitioners is an immense opportunity to intentionally steward workforce reskilling, at scale, across a broad array of disciplines.

### **Disclosure statement**

No potential conflict of interest was reported by the author(s).

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