

SKILLS FOR THE POST-PANDEMIC WORLD ∴ JUNE 2021

The Mother of Invention: Skills for Innovation in the Post-Pandemic World

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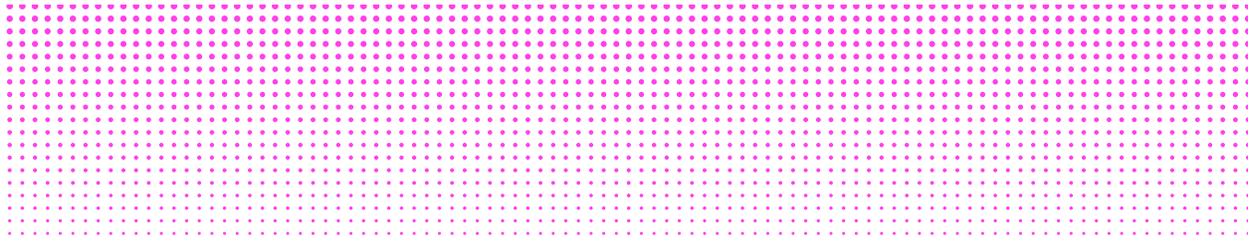


The Future Skills Centre is a forward-thinking centre for research and collaboration dedicated to preparing Canadians for employment success. We believe Canadians should feel confident about the skills they have to succeed in a changing workforce. As a pan-Canadian community, we are collaborating to rigorously identify, test, measure and share innovative approaches to assessing and developing the skills Canadians need to thrive in the days and years ahead. The Future Skills Centre was founded by a consortium whose members are:



The Future Skills Centre is funded by the Government of **Canada's Future Skills Program.**

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Skills for the Post-Pandemic World is made possible with support from



This report is available online: [English](#) | [French](#)

ISBN: 978-1-77452-060-4

ABOUT THE PROJECT

Skills for the Post-Pandemic World tackles key questions facing policymakers, employers, training providers and workers. It is urgent that society turns to face the fundamental changes in the labour market precipitated by the COVID-19 pandemic, and many players must rise to meet the new conditions of a post-pandemic world.

Society will slowly reopen and business will resume, but there will be no “return” to normal: the pandemic has dragged the future of work into the present. Digitization, work from home, plus other steepened trajectories and intensified shifts well documented in the future-of-work discourse are here now, and likely to stay.

Building on the collaborative success of the **Skills Next** series, the Public Policy Forum (PPF) and the Diversity Institute (DI), funded by the Future Skills Centre (FSC), and with new support from Microsoft, join once more to face these rapid societal shifts head-on, with research looking at the future of skills, training and retraining in ways that will chart a path forward as the pandemic continues to unfold.

The goal of this series is to build a robust policy ecosystem that supports the mobility needed for workers and employers to navigate the new reality. To do this, we examine eight key topics:

1. **Job polarization in Canada: Skills for the post-pandemic world**
2. **Digital infrastructure for the post-pandemic world**
3. **New working arrangements**
4. **Building inclusive workplaces**
5. **Immigration and the success of Canada’s post-pandemic economy**
6. **Innovation in post-secondary education**
7. **The mother of invention: Skills for innovation in the post-pandemic world**
8. **Supporting entrepreneurship and SMEs**

For more information about the project, please contact: **Andrée Loucks**, Policy Lead (PPF) and **Michael Crawford Urban**, acting Director, Research, Special Projects (FSC).

Skills for the Post-Pandemic World is funded by the Government of Canada’s Future Skills Program.

The logo for the Government of Canada, featuring the word "Canada" in a serif font with a small Canadian flag to the right of the letter "a".

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FOREWORD

SKILLS FOR THE POST-PANDEMIC WORLD

COVID-19 made a devastating debut on the world scene and launched a new era of how we live and work in our global society. The pandemic ushered in dramatic changes and deepened inequalities: health and economic crises, border closures, lockdowns, mass job losses and the curtailment of educational activities. Nevertheless, it also accelerated innovation and particularly the adoption of new technologies, compressed adoption cycles from years to weeks and transformed entire sectors – government, health care, education, retail, financial services and more.

As we see the prospect of a post-pandemic chapter ahead – thanks in part to the incredible pace of vaccine development and production – we are also challenged to imagine a different way of working, learning and living.

At the Future Skills Centre, we focus intently on ensuring that Canadians have the opportunities and resources to thrive in the future of work. It is critical to ensure that everyone, especially under-represented groups who have been disproportionately impacted by the pandemic, can access opportunities to succeed and share in Canada's prosperity. We are also committed to ensuring employers have access to the talent they need to innovate and grow. As we plan for a future after the pandemic – one in which digital skills and connections have become even more essential – we can't stress enough the urgency of developing skills strategies, policies, and programs that enable us to rebuild better and more inclusively.



This paper, part of the **Skills for the Post-Pandemic World** series of research reports, explores the concept of innovation in Canada and its role in job creation and entrepreneurship. The pandemic has drastically impacted some sectors and industries, but it has also accelerated innovation. Although discussions of the skills needed for innovation and entrepreneurship tend to focus on new inventions and the tech sector, a great deal of innovation can also be seen in small and medium-sized enterprises in more traditional sectors. As well, innovation does not just mean digitization: changes in processes, the development of new business models, and new approaches to work must all be a part of the conversation. Supporting this shift will require a comprehensive strategy and a range of policy approaches that will further propel and build on what we already know.

We thank our partners at the Diversity Institute and the Public Policy Forum for convening this research and these discussions. This is a crucial conversation as we turn our collective energy towards rebuilding our economies and educational systems to be better and more inclusive so that we can all share in a more prosperous future. We also thank the Government of Canada for its support of a national future skills strategy that builds on evidence generation and practical delivery of skills training and assessment programs.



PEDRO BARATA

Executive Director, Future Skills Centre



EXECUTIVE SUMMARY

Much has been made of the negative effects the COVID-19 pandemic has had on the economy, and the disruption, upheaval and chaos created among the workforce when the world was forced to shut down en masse. But the pandemic has also fueled a surge in innovation, as necessity forced businesses, governments and individuals to find ways to adapt. Not only has it driven the creation of new technologies, it has driven the development of new products and services, changes in processes, the development of new business models, and even shifts in the approach to work itself.

Yet much still needs to be done to ensure that Canada can keep pace with the accelerating rates of change that characterize today's economy and society, to say nothing of building sufficient resilience to overcome the current pandemic and prepare for similar future shocks. Canada has among the highest rates of investment in education and research and development (R&D), but these investments are not translating into the desired improvements to productivity, successful technological commercialization, or increases in GDP.

If innovation is the key to our economic prosperity, Canada's skills strategy must address the skills needed for innovation across sectors – from small and medium-sized businesses to large corporations and even within government itself.

In this context, this report explores:

- The definition of innovation and its connection to entrepreneurship and skills;
- The impact of the COVID-19 pandemic on innovation, particularly in small and medium-sized enterprises; and
- The implications for the definition, assessment, development and utilization of skills.

Prior to the pandemic, the innovation discourse was defined by fairly narrow understandings of innovation and a disproportionate focus on the technology sector. This preoccupation with the tech sector, tech innovation and highly skilled tech job creation has had the unintended consequence of excluding large segments of the economy and society from the innovation conversation. The arrival of COVID-19 has highlighted the importance of new business models, new ways of working, new ways of marketing and distributing, the critical importance of supporting technology adoption – and the skills needed to support this adoption – as well as the creation of new technologies. In other words, we need to think more broadly about both what constitutes innovation and about the skills required to enable it.

The arrival of COVID-19 has not only highlighted the critical importance of specific skills for specific roles that have changed or expanded, but also the skills needed to anticipate and respond to shocks to the system. Among these skills are those needed to continue to transform both the public and private sectors, to create and scale entrepreneurial ventures and to create and implement new strategies and new business models.

At the same time, there is a need to support strategic initiatives that aim to improve access to training and decent work opportunities for all Canadians to capture their innovative potential. In this context, assessing and consciously addressing skills gaps has become more important than ever, particularly the skills needed to continue to promote and consolidate gains from innovation in digital workplaces. New working arrangements have created massive challenges for some and new skills are needed among both employers and employees to navigate these new arrangements, as it is clear that a return to normal may not mean a return to the office as it existed before the pandemic.



INTRODUCTION

For decades, innovation has been a key pillar of economic development strategies worldwide due to its link to enterprise-level productivity and national economic prosperity. Research in this area has focused on questions of definition and measurement of innovation, enabling factors, and the policies and programs needed to advance it. Canada, in particular, has been challenged by the disconnection between its highly educated workforce, massive public investment in research and development, and limited payoffs in terms of productivity. More recently, research has focused not only on organizational strategies aimed at advancing innovation, but also the skills needed to do so in large organizations as well as in entrepreneurial start-ups and small and medium-sized enterprises (SMEs).¹ Talent and skills remain central to the ecosystem. But what talent? What skills?

The COVID-19 pandemic has decimated some businesses and even entire sectors, but it has also accelerated innovation in others. Innovation is often highly associated with the development of new technologies, and the tech sector dominates the discourse on entrepreneurship, but innovation is about much more than technology. Not only has it driven the creation of new technologies, it has driven the development of new products and services, changes in processes, the development of new business models, and new approaches to work itself. The pace of digitization has been dramatically accelerated by the pandemic with profound effects. Indeed, much attention has been focused in recent years on digital transformation and the urgent need to upskill and reskill, and these needs have only become greater in the past eighteen months.

But there is more. Large corporations in Canada have tended to dominate discussions of innovation and skills, yet they account for just a fraction of private-sector employment. Our economic growth depends largely on the continued creation and development of new businesses and the survival and scaling up of SMEs, which Peter Drucker, considered the founder of modern management

thinking, saw as the drivers of innovation.² Skills for start-ups and SMEs are largely ignored, yet with COVID-19 these organizations are more important than ever. Additionally, Canada, like many countries, has substantial skills and employment in the public sector and in non-profits, where COVID-19 has also wreaked havoc while accelerating the pace of innovation. Therefore, Canada's skills strategy must address skills for innovation across sectors. This report is an exploratory effort to better understand:

1. The definition of innovation and its connection to entrepreneurship and skills;
2. The impact of the COVID-19 pandemic on innovation, particularly in SMEs; and
3. The implications for the definition, assessment, development and utilization of skills.

Innovation and Growth

Innovation has long been believed to drive economic growth at both the organizational level (e.g., increased profits) and the societal level (e.g., increases in GDP). Traditional understandings of innovation and growth focus heavily on the invention of new technologies and investments in research and development (R&D). Yet, increasingly, concerns are being raised that these investments are not producing the desired results. For example, Canada has among the highest rates of investment in education and R&D but this is not translating into the expected improvements to productivity, number of technology commercializations or increases in GDP. In fact, despite these large investments, Canada ranked 17th overall when the Global Innovation Index 2020 measured the innovation performance of 131 economies across 80 indicators (though Canada was recognized for its strong infrastructure).³

Part of this disconnection stems from the way in which innovation is understood. Innovation is not actually just about the discovery or creation of new technologies or the commercialization of R&D. Innovation is about doing differently – the successful introduction of new ideas to improve or create a process, an outcome, a product or knowledge for the benefit of an organization (or a society) and its stakeholders.⁴ In other words, the creation of a new technology or solution, whether a computer application or a vaccine, is not actually an innovation until it is adopted. It is important, therefore, to think about innovation more broadly – to include the adoption of new technologies, of new processes and new business models. Economist Joseph Schumpeter defined innovation as consisting of new products, new methods of production, new sources of supply, the exploitation of new markets and new ways of organizing business. More specifically, he defined innovation as “new combinations” of existing resources, and saw the act of creating these combinations as the function of entrepreneurs.⁵ Similarly, the **Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation** refers to “a new or improved product or process (or combination thereof)

that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)".⁶

As our understanding of innovation changes, we need to change the ways we assess it. Rather than focusing just on measures associated with discovery – for example, the creation of intellectual property such as patents – we need to consider other ways of tracking and measuring innovation. For example, while farmers may not be filing many patents, they are among the biggest users of the Internet of Things (IoT). Recognizing this gap in existing definitions, there is new work underway to expand our understanding of innovation and how it has been assessed – for example, through the Organisation for Economic Co-operation and Development's (OECD) new expert panel on rural innovation, which is exploring ways to improve the definition and measurement of innovation.⁷

While some start-ups are creating new technologies, COVID-19 has accelerated the adoption of existing technology across virtually every sector and the adoption of technology is arguably an even stronger driver of economic growth than its creation. Whether one looks at artificial intelligence (AI), augmented and virtual reality (AR/VR), data analytics or quantum computing, increasingly there is recognition that the complex processes around adoption – the organizational and consumer behaviour, the policies and regulatory frameworks, the social impacts and privacy issues, the distribution channels and implementation pathways – are critically important parts of understanding innovation processes.

The innovation ecosystem

Globally, national governments invest heavily in programs intended to advance innovation and economic growth and Canada is no exception, investing billions in R&D, incubators and accelerators, and targeting financing (loans, grants and tax breaks) to support the creation of new technologies. While these investments can pay off handsomely – Canada does boast a number of high growth technology “unicorns” valued at more than \$1 billion – these investments are often high risk. Indeed, only about 8 percent of start-ups survive more than five years. Moreover, innovation within existing companies, large and small, is equally important to driving economic growth and sustainable jobs.

The COVID-19 pandemic has highlighted, for example, how the adoption of technology across sectors has transformed the distribution of products and services from retail, to health care, to government, to education. But again, many of these major innovations, while they may be technologically enabled, are actually more a function of new business models. For example, the

success of Uber and Airbnb were not due to any significant technological innovations, rather their success was the result of new business models.

Why is this important? Prior to COVID-19 we saw a focus on narrow understandings of innovation and a disproportionate focus on investing in the technology sector, whether through granting councils or funding from regional development agencies and government programs supporting small business and entrepreneurs. This preoccupation with the tech sector, tech innovation and highly skilled tech job creation has had the unintended consequence of excluding large segments of the economy from the innovation conversation.

The pandemic has highlighted the importance of new business models, new ways of working, new ways of marketing and distribution, and the critical importance of supporting skills to support technology adoption as well as creation. Indeed, the greatest barriers in the successful deployment of COVID-19 vaccines have not been technological, but logistical.

Skills for Innovation

Thinking more broadly about innovation also requires that we think more broadly about skills. While models of innovation ecosystems and innovation measures place a heavy focus on skills, the full spectrum of skills required for innovation is still under-explored. Historically, there has been a focus on highly skilled talent, for example, the proportion of PhDs in the population or graduates in STEM (science, technology, engineering and mathematics). While there is little doubt that education is associated with social mobility and economic growth, the focus on PhDs and STEM and on, for example, patents, reflects a particular orientation to innovation – typically based on the commercialization of research – when increasingly there is recognition that a broader definition and therefore broader skill set is required.

There is some focus on the knowledge, attitudes and behaviours – the competencies – needed to drive innovation, but this is a domain that is under-studied and full of contradictory research. Research reinforces the importance of sectoral approaches in understanding innovation, as well as the importance of recognizing that innovation spans more than the creation of new technologies.

Critically, innovation also includes changes within organizations, whether in terms of new production processes or technology adoption, as well as the process of elevating a firm's overall capacity to innovate.⁸

In spite of the general emphasis on technology skills, other skills are equally critical. For example, one study suggested marketing skills are one of the most significant differentiators of innovating and non-innovating firms: 33 percent of innovation-active (innovating) firms reported using marketing skills, whereas only 8.7 percent of non-innovation-active (non-innovating) businesses did.⁹ A firm is considered to be innovation-active if it had engaged in some kind of innovation activity during the period of data collection, which could include planning or execution of some type of change.¹⁰ There were also substantial differences between innovation-active and non-active businesses in finance-related skills, IT skills (professionals and support technicians) and business management.¹¹ Often, technical skills and “soft skills” (a misnomer) are dichotomized in debates when the evidence is increasing that combinations of both are important, with the relative concentration depending on context.

Beyond the analysis of innovation skills by sector and in large corporations, there is also considerable research on the skills needed for entrepreneurship. While individual competencies and attitudes – for example, the oft-cited entrepreneurial intent – assign considerable agency to individuals in creating start-ups and driving entrepreneurship in SMEs, most of the literature suggests individual change agents are less able to drive change in large organizations without far more attention to processes. A CEO of a start-up may say “make it so” and expect change to occur quickly, whereas in large organizations, even with executive-level support, change often takes months or years because of structural and institutional barriers.

Considerable research has also focused on questions of whether entrepreneurs are “born” or “made”.¹² The individual characteristics and circumstances of entrepreneurs (e.g., knowledge, skills, attitudes, resources, family situation, geographic location) have a profound impact on their ability to spot and seize opportunities.^{13, 14, 15} Entrepreneurial self-efficacy, which is the confidence in one’s abilities to perform entrepreneurial tasks and to create a business, is shaped by many factors. A combination of personal motivation and attitudes, as well as the supportiveness of surrounding environments, has been found to impact whether individuals will exploit an opportunity.^{16, 17, 18} At the individual level, we also need to consider skills and capacity. While a focus on technology skills dominates the discourse, particularly among large corporations, **NGen** (Canada’s advanced manufacturing supercluster) has identified management and leadership skills as a gap overall among manufacturing SMEs.

Many would argue that in spite of the preoccupation with technology skills, more SMEs fail because of a lack of other skills in the founder or founding team.^{19, 20} In a recent Harvard Business Review article, several factors were identified as contributing to the failure of start-ups, many of which point to a lack of managerial skills – establishing organizational structure, specialized roles and hierarchy, defining mission and strategy, building culture, hiring more specialists and finding the right talent (particularly to provide expertise the founder lacks), business planning, leadership and strategy.²¹ In other words, the skills needed to manage ongoing innovation and growth²² are often ignored because of an outsized focus on technology and technology skills.²³

Even within more established SMEs, management issues persist, thereby limiting innovation. The ability to innovate, define and implement new opportunities is often challenging, particularly in a crisis such as the pandemic. Prior to the pandemic, 30 percent of SMEs in Ontario did not have internet access – technology that proved critical to the survival of many during the pandemic.²⁴ Initiatives aimed at assisting entrepreneurs and managers of SMEs to recognize and exploit opportunities is critical. Succession planning is also a major concern with many established SMEs. Clearly, there is a need to better understand the skills and talent requirements to help start-ups scale and survive and to help SMEs thrive.

COVID-19 AND INNOVATION: UNEVEN IMPACTS

The COVID-19 pandemic decimated some industries and many of the jobs lost will likely never return. But other sectors grew – Shopify, for instance, was catapulted to the top of the list of Canada’s largest companies.²⁵ Some of the sectors hit hardest by the pandemic were ones, such as retail, which had long been threatened by technological disruption and whose decline COVID-19, arguably, simply accelerated. The latest data from Statistics Canada comparing year-over-year job loss/growth make this clear, as shown in Table 1. In some cases, there was even important divergence between segments within a sector. For instance, in Transportation and warehousing, the aviation industry crashed while logistics and delivery segments soared.

Table 1: Impacts of COVID-19 on employment

Sectors with highest job loss		February 2020-February 2021 Employment Change (%)
	Accommodation and food services	-26.1
	Information, culture, recreation	-15.1
	Agriculture	-12.4
	Business, building and other support services	-8.2
	Other services (except public administration)	-6.0
	Retail trade	-5.4
	Transportation and warehousing	-4.9
	Construction	-3.5

Sectors with lowest job loss		February 2020-February 2021 Employment Change (%)
	Professional, scientific and technical services	+ 5.6
	Educational services	+ 3.7
	Public Administration	+ 3.4
	Finance, insurance, real estate	+ 3.1
	Natural resources	+ 2.6
	Utilities	+ 2.5
	Wholesale trade	+ 0.7

Source: Statistics Canada. (2021). Labour Force Survey, February 2021.

The longer-term outlook is not entirely different, although some areas – construction and infrastructure, for example – are expected to grow again when pent-up demand is unleashed. For sectors disrupted by COVID-19, retraining displaced workers is key. But supporting sectors with growth potential is also key and skills for innovation are a critical part of this.

It is also important to remember, however, that there have been some conditions at play that are unique to the pandemic and may not continue afterwards. For example, in the tech sector, even while demand for products and services, as well as employment, first recovered and then soared, there is also evidence that low consumer confidence and supply chain interruptions have caused some businesses to scale back new projects in favour of projects aimed at simply maintaining existing infrastructure.²⁶ Moreover, recall that process innovations across many sectors and occupations have involved the use of already existing technology in new areas, not the invention of new technologies. Indeed, many innovations to policies and practices in organizations, businesses, and educational institutions have accommodated technology that already existed but formerly did not have a large role in a given workplace.



NECESSITY IS THE MOTHER OF INVENTION: FIVE FORMS OF INNOVATION

For decades, Canada's innovation strategy has been preoccupied with the development of new technologies, with inadequate attention to other key components of innovation, such as supporting the widespread adoption of these new technologies. Regardless of the potential for technologies like AI, machine learning, the IoT and advanced robotics, without adoption there is no real innovation.

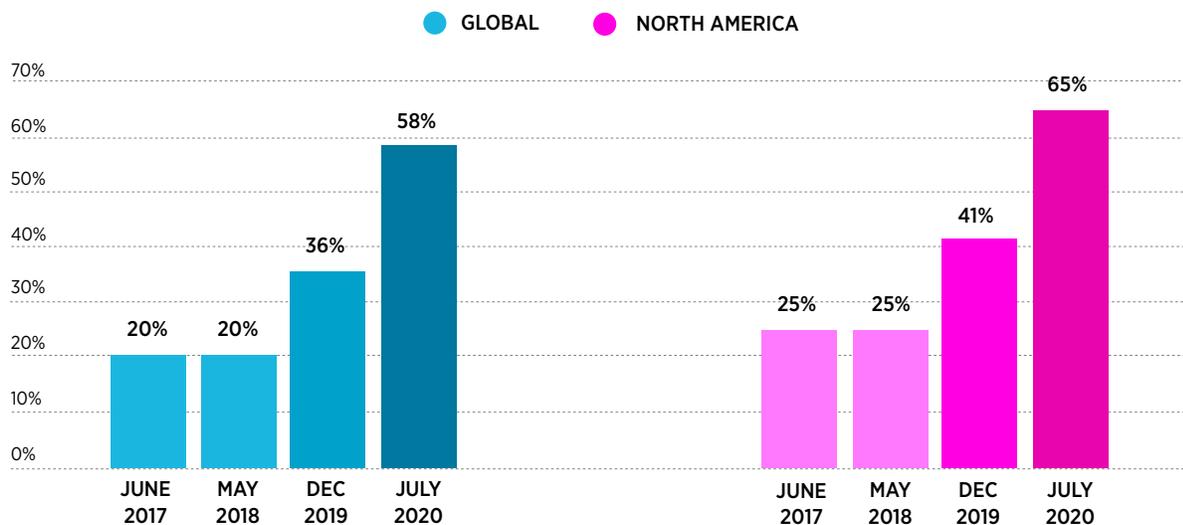
This principle applies to both technology and other types of innovation. In spite of the preoccupation with advanced technology, prior to the onset of the pandemic, a 2019 report by the Business Development Bank of Canada observed that only 40 percent of SMEs had an online presence.²⁷ Slow productivity growth has been attributed to this slow pace of information and communication technologies (ICT) investment.²⁸ Experts have lamented that in spite of being a world leader in many areas such as AI, Canada is “bad slow” in its adoption of new technologies.²⁹ Gartner's Hype Cycle (a methodology for predicting how a technology or application will evolve, and how its use will evolve, over time) suggests that the promise of technology for productivity often outstrips the realized productivity gains over time.³⁰

The arrival of the pandemic has disrupted and even destroyed many businesses, as well as wreaking havoc on whole sectors, but it has also accelerated the rate of technology adoption, compressing into weeks changes that had previously been expected to take years.³¹

According to the 2020 Canadian CIO Census, 78 percent of leaders in the information technology (IT) sector report that the pace of change for longer term digital transformation plans has accelerated because of the impact of COVID-19.³² For example, investments in remote working technologies and processes have ramped up and are expected to be an important part of the new post-pandemic normal. Additionally, advanced technologies, like the implementation of robotic process automation, have also been boosted since, “robots don’t have to be in quarantine.”³³

Clearly, organizations have made many changes to adapt to COVID-19, ranging from new business processes to managerial practices and employee skills.³⁴ Digitization of customer interactions, in particular, has increased. For example, Figure 1 shows the exponential increase in business-customer interactions that took place digitally in 2020, aided by government and private sector investments in e-commerce.³⁵ Shifts to digital delivery of goods and services has required proprietors, staff and customers to upgrade their level of familiarity with digital tools and platforms, as well as upgrade their digital skills, at a record-setting pace.

Figure 1: Average share of customer interactions that are digital



Source: McKinsey & Company. (2020). How COVID-19 has pushed companies over the technology tipping point – and transformed business forever.

The impact of this has been uneven and highly dependent on sector, but also dependent on the ability to innovate. For example, many technology companies such as Shopify saw explosive growth for existing products and services, fueled by the dramatic increase in digitization across sectors.³⁶

While innovation and skills discussions often focus on overarching themes, it is clear there are significant differences across industries that need to be addressed. As well, the preoccupation with R&D and innovation in large corporations focused primarily on technology leaves out significant

opportunities to explore and learn from other forms of innovation in other areas. Indeed, COVID-19 has had a profound impact on all industries, but in significantly different ways. While some of this innovation has led to the creation of new products and services – vaccines being perhaps the most obvious – it has also profoundly changed business models, processes and the very structure of work itself, fuelled in part by the acceleration of digitization. This, in turn, has accelerated the demand for skills to innovate and to create and scale new businesses, an area often overlooked in the skills agenda. Shifts in the private sector have been abrupt and span many industries, as organizations seek to retain clients and customers, to maintain revenue streams and to cope with changes in behaviour. This section is organized based on themes that apply to many industries.

NEW GOODS AND SERVICES



The pandemic has accelerated investments in science and engineering to support the commercialization of goods and services such as new vaccines, new personal protective equipment (PPE) and new approaches to sanitizing. For example, Canadian Medical Association subsidiary Joule innovated improvements to PPE and antimicrobial coatings for clinic and hospital surfaces.³⁷ Others created new apps and tools to respond to new needs, like Mapinhood, an app that provides timed maps of neighbourhoods referencing historical foot traffic data to suggest the quietest routes in hopes of supporting social distancing.³⁸

A number of companies responded to COVID-19 by shifting the nature of products and services they produced, building on existing capacity to meet increased demand. For example, Magna and Linamar shifted from manufacturing auto parts to respirators; Dispersa pivoted from cleaning up oil spills to producing hand sanitizer; and Guelph's EnvisionSQ switched from producing a smog-destroying traffic barrier to producing a material that can coat surfaces and provide antibacterial protection for up to a year.³⁹ Other companies have pivoted to stay relevant in changing markets. Spotify, for example, lost revenue when advertisers cut budgets after the start of the pandemic. The company began allowing the uploading of podcasts and, in doing so, has become even more relevant to entertainment consumers.⁴⁰

The new online environment also spurred retail innovations. For example, some online retailers are offering AI-enabled stylist advice that can gather a data-driven portrait of a person and make style and product suggestions based on the purchases of others who look similar.⁴¹ Additionally, some

companies have introduced AI-enabled chat bots to answer customer questions, delivering a more personable experience to a customer despite the disassociated nature of online commerce. Other changes include apps like Bumble and Facebook Dating being upgraded to offer video dating capacities, and Airbnb pivoting to help hospitality providers offer virtual experiences over the Airbnb platform. Many of these changes have been experimental as both firms and clients have tried to find new ways of navigating pandemic restrictions.

NEW BUSINESS MODELS AND WAYS OF OPERATING



With the onset of the pandemic, everything from restaurants and hairdressers to yoga studios pivoted to online delivery models. In recognition of this changed reality, starting in May 2020, the City of Toronto partnered with Ritual ONE, a smartphone app, to help restaurants take food orders from social media and their websites, extending this partnership in October during Small Business Month.⁴² While some businesses had e-commerce accounts already in place many, such as bakeries and butchers that had previously relied on foot traffic, needed a functional push-and-play platform that they could turn to quickly and easily to facilitate online sales. Products such as Shopify and Ritual ONE provided both the transactional platform and support, as well as access to some basic analytics.

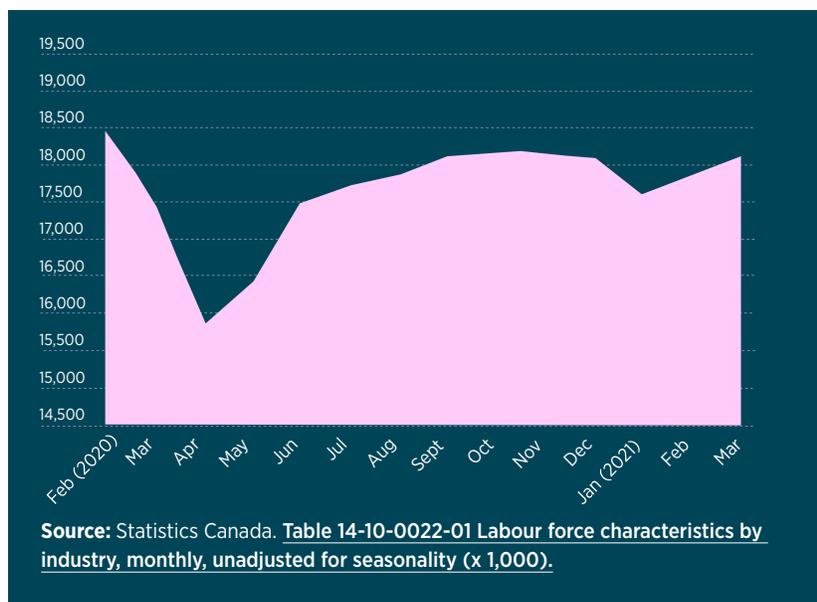
The City of Toronto further supported small business by providing subsidized access (free for business owners) to services that created websites for businesses that previously did not have them. Many previously offline businesses, from pottery studios to home renovation services, had not previously needed an online presence to secure business, but now required it to capture a share of the market. This accelerated shift to virtual also opened up opportunities to reach new markets. While the evidence is still anecdotal, some companies have reported the shift to online enabled them to export and dramatically increase sales. Many of these changes are likely to remain post-pandemic, and this period may determine the new shape of retail across a variety of sectors.⁴³

PROCESS INNOVATION



While pre-pandemic projections of the impact of automation on jobs ranged considerably,⁴⁴ there is little doubt that COVID-19 has escalated the oft-neglected adoption of technologies. While employment in the tech sector has been resilient – with employment levels recovering to pre-pandemic levels by May 2020 – retail firms and financial institutions have increased their revenues while decreasing their workforce.⁴⁵ Indeed, there is also little doubt that many companies are taking advantage of the disruption to accelerate plans to use technology to reduce their workforce.⁴⁶ There has been an uptick in e-commerce compared to pre-pandemic, but the economic activity generated by e-commerce is not large enough to offset the job losses that have occurred since the onset of the pandemic.⁴⁷ Figure 2 shows levels of employment across the population between February 2020 and March 2021.

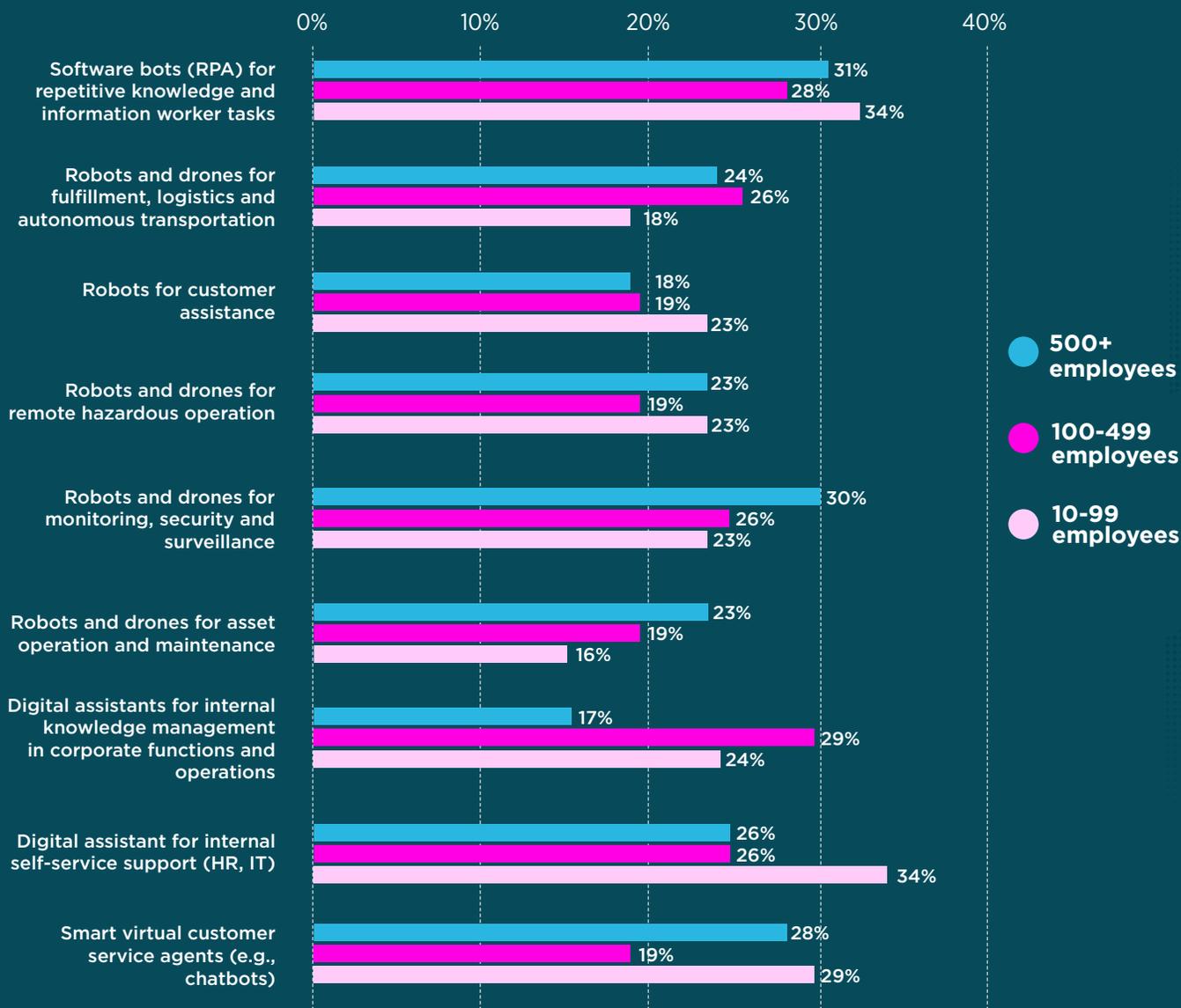
Figure 2: Monthly employment in Canada (x 1,000), aged 15 and older



Large employers such as banks are planning sizable layoffs⁴⁸ while SMEs have also laid off employees because of COVID-19, though small businesses with at least one employee were slightly more likely than medium-sized or large businesses to keep the vast majority of employees (that is, they were more likely to lay off less than one percent of their workforce).⁴⁹

As shown in Figure 3, a pre-COVID study of technology trends showed that large companies were already planning to use technologies to augment or replace labour.⁵⁰ Small businesses, meanwhile, were leading in plans to replace human labour with four of nine types of advanced technology: software bots (robotic process automation, or RPA) for repetitive knowledge and information worker tasks; digital assistants for internal self-service support (HR, IT); smart virtual customer service agents (e.g., chatbots); and robots for customer assistance.⁵¹

Figure 3: Plans to use advanced technologies to replace human work by company size



Source: Bouchard, J.P. (2020). A Foundation for the Next Normal: Outlook of Technology Adoption and its Impact in the Canadian Workplace. International Data Corporation, Diversity Institute, Future Skills Centre.

COVID-19 dramatically accelerated the adoption of these technologies and, in so doing, is contributing to what has been described as the “hollowing out” of middle skill jobs,⁵² thereby heightening the need to reskill and upskill.⁵³ Even previously low skill jobs – for example, warehousing – require increasing levels of technical skills to make effective use of technologies such as robotics and inventory control systems.

GROWING EXISTING PRODUCT SALES IN RESPONSE TO INCREASED MARKET DEMAND

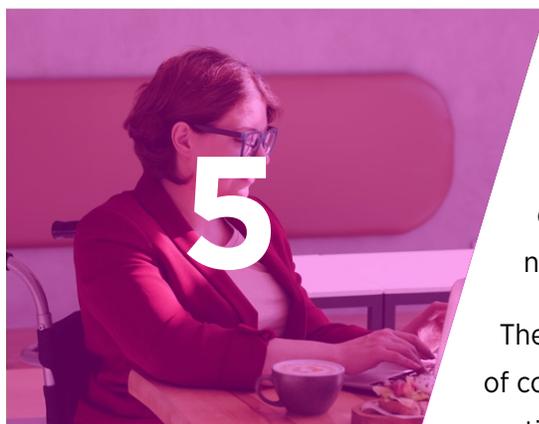


Shopify has become Canada's most valuable company, not because it developed new technologies, but because the massive shift to online selling led to rapid growth in its market.⁵⁴ COVID-19 has expanded markets for online products benefiting companies from DotHealth.ca, to Shopify, to Sampler (a firm that matches customers with free samples of products). On Black Friday 2020, there was an almost 22-percent increase in online sales in the United States compared with the previous year, bringing in the second largest amount of income for online

sales in history.⁵⁵ Canadians now do 10 percent of their shopping online, with this figure representing a doubling of online sales compared to before the pandemic.⁵⁶ Gains in online sales took place as in-person commerce rates declined, sending the signal that people are doing similar amounts of shopping as before, but using different retail channels, if not different vendors.⁵⁷

Financial technology (Fintech) firms – that is, firms that specialize in using new technologies to deliver financial services, often in non-traditional ways – also experienced significant growth in 2020, with higher growth in countries where stricter lockdown measures were implemented. In a recent study, 60 percent of Fintech firms surveyed reported launching a new product or service in response to COVID-19, with an additional 32 percent stating they planned to roll out a new product or service in the near future.⁵⁸ The innovation explosion in Fintech is likely related to the significant capacity of the sector to pivot to online and increasingly digital forms and vehicles for firm operation and product and service development.

NEW WORKING ARRANGEMENTS



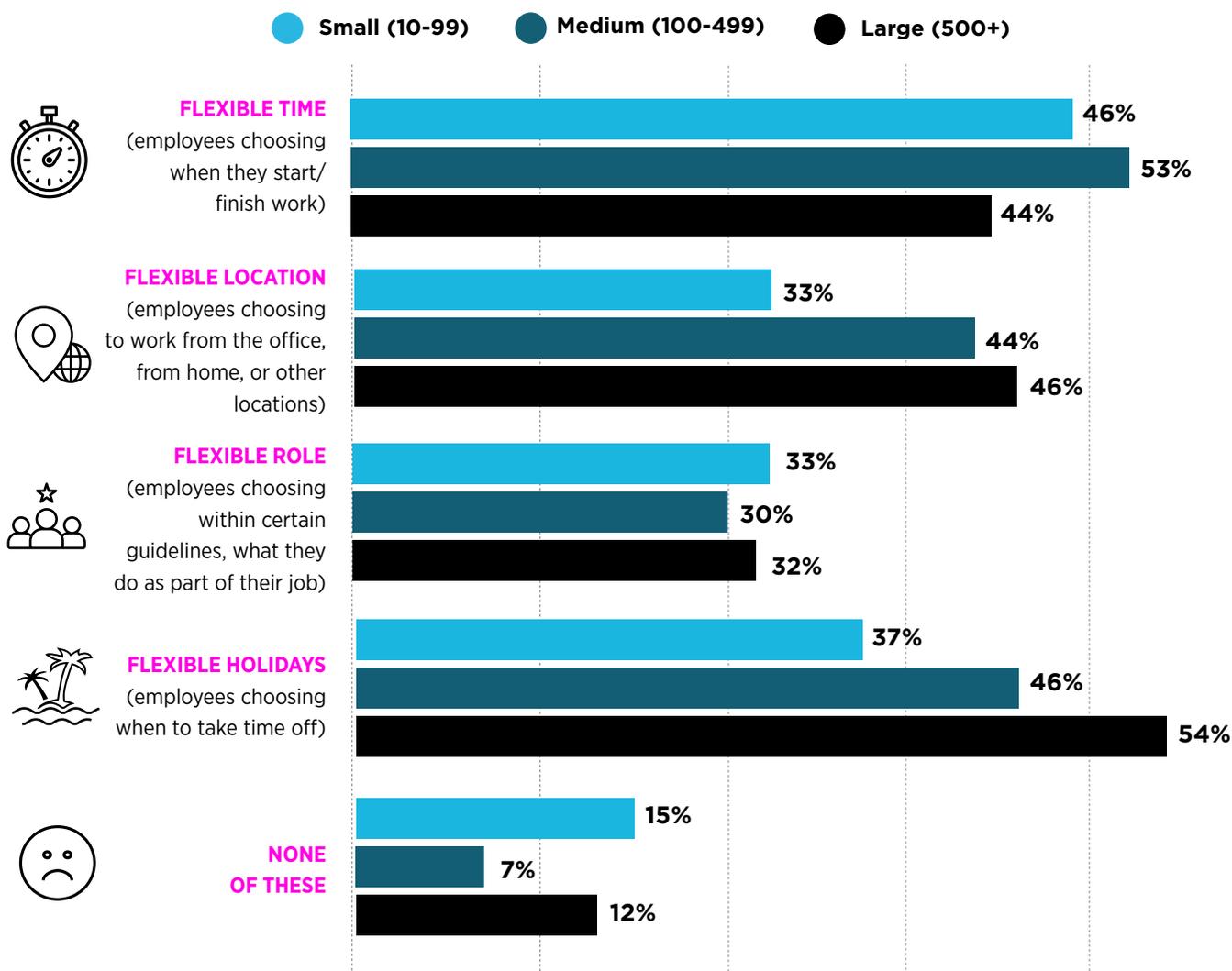
Another paper in this series, **New Working Arrangements**, dives deep into issues related to how the pandemic has impacted the way we work, including the significant shift to teleworking. Nonetheless, a brief overview of the connection between innovation and these new trends in work is warranted.⁵⁹

The lockdown has accelerated the deployment and adoption of collaborative technologies. For instance, video conferenced meetings have gone mainstream with platforms such as Zoom

transforming processes. But it has also required new skills and approaches for organizing work, meetings and communications. New norms are emerging quickly, as colleagues and organizations experiment to service clients, keep careers on track, welcome new employees, communicate values and establish collegial remote relationships.

Even before the onset of COVID-19, businesses were preparing for the future of work and considering flexible work arrangements, although not all businesses emphasized the same set of strategies. As shown in Figure 4, medium-sized businesses were the most likely to offer flexible time (53.3 percent), while large businesses were the most likely to offer flexible location (45.8 percent) and flexible holidays (53.9 percent). Small businesses were the most likely to offer no flexible work provisions at all (14.7 percent).⁶⁰ Younger Canadians also expect greater work-life balance, thus nudging businesses to implement flexible working arrangements to find, keep and grow talent.⁶¹

Figure 4: Which of the following flexible working arrangements does your organization offer or plan to offer?



Source: Bouchard, J.P. (2020). A Foundation for the Next Normal: Outlook of Technology Adoption and its Impact in the Canadian Workplace. International Data Corporation, Diversity Institute, Future Skills Centre.

During the pandemic, 20 percent of small businesses (those with fewer than 100 employees) allowed parents to work from home, while over half of businesses with more than 100 employees allowed parents to do so, though this divergence may have been influenced in part by different lockdown measures imposed by the various provincial and territorial governments. The number of businesses that allowed parents to telework or work remotely was highest in the Finance and insurance (41.2 percent), Information and cultural industries (40.4 percent), and Wholesale trade (30.3 percent) sectors, while it was lowest in Agriculture, forestry, fishing and hunting (5.7 percent), Retail trade (4.5 percent), and Accommodation and food services (2 percent), where work cannot yet be conducted properly through digital mediums.⁶² This bifurcation in experiences has laid bare the differences between better paying knowledge work that can be done remotely and the risks faced by other workers, particularly frontline workers in service industries.

While the nature of tasks associated with a job necessarily affects what work can be done at home, management attitudes also have a huge impact on workers' abilities to work remotely.

There are decades of research indicating that remote work can actually lead to higher productivity and satisfaction because of the flexibility it offers, thus allowing workers to organize work in a way that best meets their needs.^{63, 64} Some research shows it can also benefit workers with disabilities and working parents as well.⁶⁵

At the same time, the resources required to work at home – like space, air conditioning, financial resources, access to technology, broadband access, and digital skills and literacy – can exacerbate disadvantages among the most vulnerable, even with employer attempts to support remote workers.⁶⁶ Additionally, challenges can be amplified for persons with disabilities, older Canadians, newcomers who speak English as a second language, and rural Canadians who lack digital skills or access to broadband internet. The poor quality of rural broadband internet service may mean that some workers will face the choice of relocating or moving to suburban and urban areas. Overall, 94 percent of Canadians have internet at home, but of those who do not, almost 30 percent reported that the reason they did not have internet at home was because the cost of internet was prohibitively high, while 8 percent reported the internet was not available in their area.⁶⁷

Real commitments to people-centered approaches and employee well-being have, partly of necessity, appeared during the pandemic. New approaches to employee engagement, mental health support and “pulse taking” have emerged as employers have had to confront, some for the first time, the massive costs of stress in the workplace. Again, new approaches require new skills.

There are opportunities that still need to be realized. Working around the clock to develop and deliver programs and reboot product and service delivery has left little time to reflect on new and best practices, but this moment does offer opportunities to institutionalize new approaches and learn from them.

The challenge is to reinvent processes and procedures to survive during the pandemic while minimizing risk and maintaining revenues, and this has led to unprecedented levels of experimentation and the acceptance of new ideas that were previously unpalatable to many.



IMPLICATIONS FOR SKILLS

Arguably, the skills to innovate, adapt and be resilient in the face of challenges and change are more important than ever. Our view of resilience has been recast, recognizing the role of frontline workers but also understanding that our planning processes have blind spots. While there were endless forecasts pre-pandemic of technological disruption, as well as some focused on environmental impacts, few futurists or think tanks raised the spectre of the type of crisis created by COVID-19.

In the World Economic Forum (WEF) Future of Jobs Report (2020), the list of top skills needed has shifted in response to these changes.⁶⁸ The report noted that 50 percent of people will need to reskill within the next five years due to the double disruption of COVID-19 and the increasing technological automation that had already been transforming work pre-pandemic. Comparing the 2020 report with 2018, we see that skills associated with innovation and entrepreneurship dominate. Attention to detail and trustworthiness; emotional intelligence; and co-ordination and time management have fallen off the list, while technology use, monitoring and control; technology design and programming; and resilience, stress tolerance and flexibility have risen – reflecting, it would seem, the rapid advancement of digitization and the need to adapt to changing work and a changing world.

Table 2 highlights these shifts in the top 10 skills needed for the future of work between the 2018 and 2020 reports. While the top five skills are the same (though have been re-ordered), three skills highlighted in the 2018 column (in teal) do not appear again in the 2020 column, replaced by the skills highlighted in the 2020 column (in purple).

Table 2: Comparing top skills in demand needed in the future of work

	WEF 2018	WEF 2020	Change in Ranking
Analytical thinking and innovation	☑	☑	—
Active learning and learning strategies	☑	☑	⬆
Complex problem solving	☑	☑	⬇
Critical thinking and analysis	☑	☑	⬇
Creativity, originality and initiative	☑	☑	—
Leadership and social influence	☑	☑	⬆
Technology use, monitoring, and control	—	☑	ADDED
Technology design and programming	—	☑	ADDED
Resilience, stress tolerance and flexibility	—	☑	ADDED
Reasoning, problem solving and ideation	☑	☑	⬇
Attention to detail and trustworthiness	☑	☒	DROPPED
Emotional intelligence	☑	☒	DROPPED
Co-ordination and time management	☑	☒	DROPPED

Source: World Economic Forum. (2018). [The Future of Jobs Report 2018](#); World Economic Forum. (2020). [The Future of Jobs Report 2020](#).

There is also significant overlap between the skills identified in the WEF's 2020 Future of Jobs report and the skills identified in the Government of Canada's recently announced **Skills for Success** framework (see Figure 5) and program. The government's investment in developing these skills, which is currently valued at \$298 million over three years, is intended to help Canadians at all skills levels improve their foundational and transferable skills, such as literacy and numeracy, by funding the design and delivery of training programs. The sorts of programs envisioned include supporting community organizations working to strengthen basic numeracy and literacy skills in equity-seeking groups and employers looking to deliver training designed to improve their employees' teamwork and communication skills. This initiative will also support the development of training resources and assessments that will be available to all Canadians online at no cost.

The development of the framework should improve the effectiveness of these types of programs by providing a common and better defined understanding of these skills. Beyond benefiting

individual training recipients, it is also hoped that this investment will pay back a significant societal return: **Research shows** that a 1 percent increase in Canadians' overall literacy level could be associated with a 2.5 percent rise in labour productivity and a 1.5% rise in Canada's per capita GDP.

Table 3: The Skills for Success Framework

Reading	Your ability to find, understand, and use information presented through words, symbols, and images. For example, at work we use this skill to read memos, emails, reports, instructions, and safety manuals; as well as to locate information on forms and drawings.
Writing	Your ability to share information using written words, symbols, and images. For example, at work we use this skill to fill out forms and write emails, instructions, and reports.
Numeracy	Your ability to find, understand, use, and report mathematical information presented through words, numbers, symbols, and graphics. For example, at work we use this skill to perform calculations, order and sort numbers, make estimations, and analyze and model data.
Digital	Your ability to use digital technology and tools to find, manage, apply, create and share information and content. For example, at work we use this skill to take measurements, create spreadsheets, safely use social media and make online purchases using digital devices such as smartphones, sensors, and computers.
Problem Solving	Your ability to identify, analyze, propose solutions, and make decisions to address issues; monitor success; and learn from the experience. For example, at work we use this skill to make hiring decisions, select courses of action, and troubleshoot technical failures.
Communication	Your ability to receive, understand, consider, and share information and ideas through speaking, listening, and interacting with others. For example, at work we use this skill to discuss ideas, listen to instructions, and serve customers in a socially appropriate manner.
Collaboration	Your ability to contribute and support others to achieve a common goal. For example, at work we use this skill to provide meaningful support to team members while completing a project.
Adaptability	Your ability to achieve or adjust goals and behaviours when expected or unexpected change occurs, by planning, staying focused, persisting, and overcoming setbacks. For example, at work we use this skill to change our work plans to meet new deadlines, to learn how to work with new tools, and to improve our skills through feedback.
Creativity & Innovation	Your ability to imagine, develop, express, encourage, and apply ideas in ways that are novel, unexpected, or challenge existing methods and norms. For example, at work we use this skill to discover better ways to complete tasks, to develop new products, and to deliver services in a new way.

Source: Government of Canada. (2021). [Learn about the Skills](#).

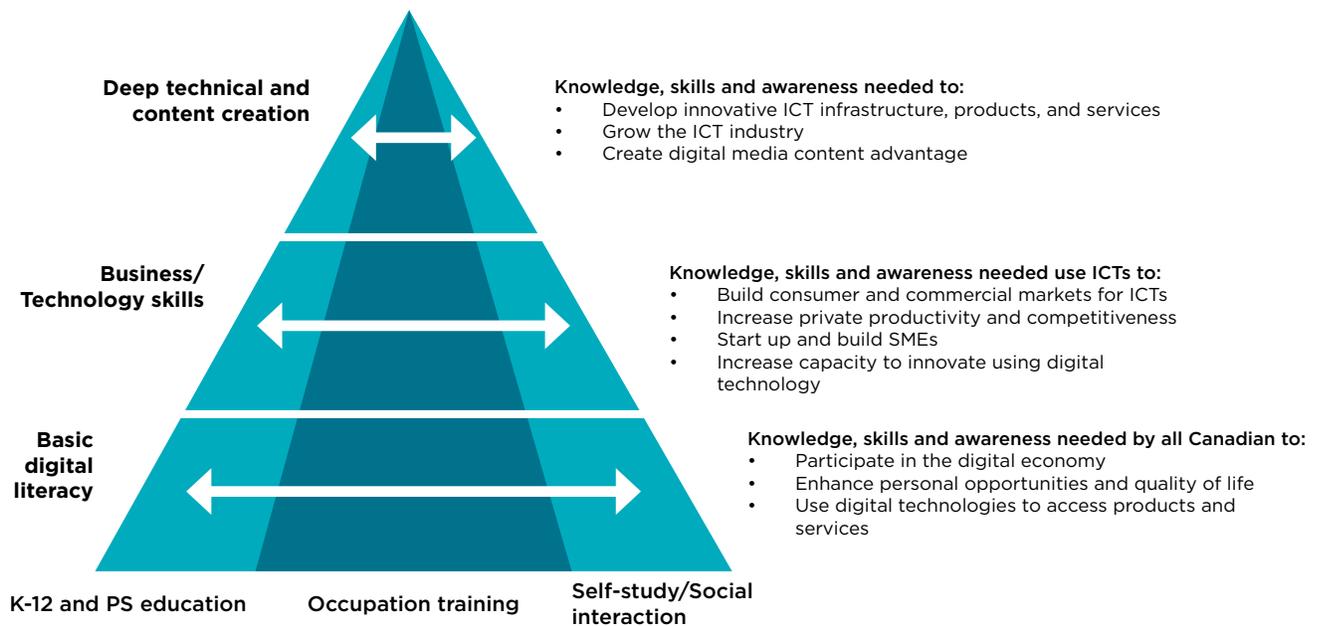
DIGITAL SKILLS

There is little doubt that with the expansion of digitization, the demand for digital skills has increased dramatically. But which digital skills remains a question, particularly given the prevalence of murky definitions. For example, a 2020 OECD report concluded digital skills were the top in-demand skill among employers in Ontario.⁶⁹ But a more granular analysis is revealing. For example, only 10 percent of respondents identified software development and Java programming skills, which are deep technological skills of the sort most often prioritized in discussions of innovation, as the digital skills they were demanding. Three quarters (75 percent) identified the ability to use more basic Microsoft Office applications and spreadsheets as the digital skills they required. Another 15 percent identified middle-level skills associated with applications such as the programming language SQL or technical support, which do not require a programming background (a basic level of proficiency can be developed in a week of intensive study).⁷⁰ While software development and Java programming are often associated with computer science degrees or intensive training programs lasting several months, basic SQL, spreadsheet and Microsoft Office skills can be taught in days, reinforcing the need to more clearly define what we mean by skills. Therefore, the focus on dramatically increasing the number of graduates in engineering and computer science may be misdirected. Deeper analysis is needed to define and assess the skills required and then develop and deploy them.

As we have seen during the pandemic, there has also been massive demand for what we would term hybrid skills. Rather than the skills needed to develop technology, the focus has been on the skills needed to match technology to organizational goals and objectives and to support its adoption.

Importantly, when people hear the term digital skills, they think about things like coding or artificial intelligence, but, as just discussed, digital skills exist along a spectrum.⁷¹ Likewise, ICT skills and competencies have become increasingly embedded into jobs and sectors far beyond typical ICT roles. It is helpful to think of digital skills as classifiable into four categories: general workforce digital skills; data skills; system infrastructure skills; and software and product development.⁷² Interestingly, the four digital skills most in demand are all skills with low levels of digital intensity, confirming that while we need people who are experts in development, we need more people with more basic competencies. Figure 5 demonstrates that the bulk of the digital skills people will need for the future of work are at a fairly basic level.

Figure 5: What are digital skills?

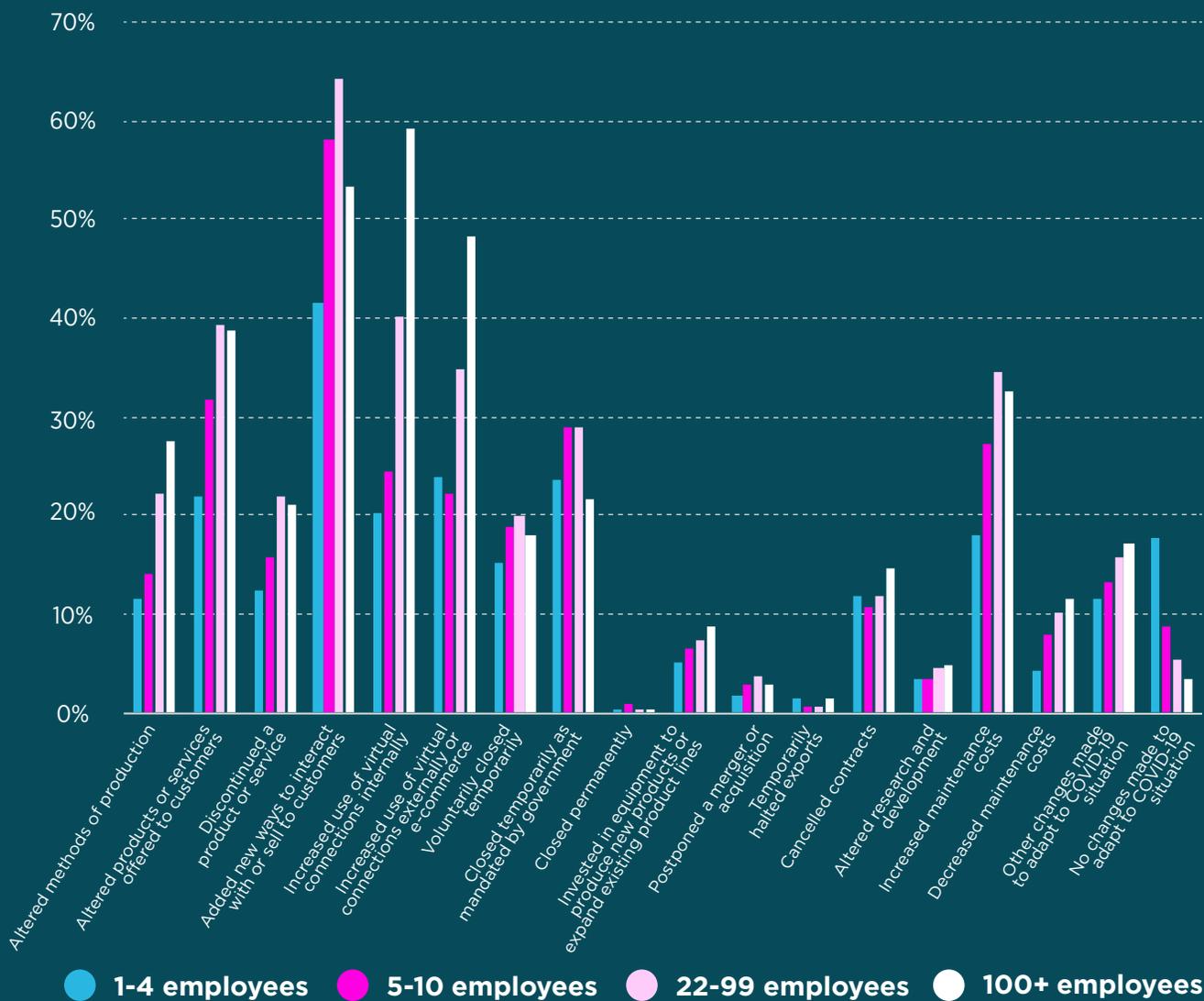


Source: Based on Media Awareness Network. (2010). Digital Literacy in Canada: From Inclusion to Transformation.

SKILLS FOR WORKING IN A NEW ENVIRONMENT

Businesses have innovated to adapt to the pandemic. As Figure 6 shows, the ways in which they've done so include new processes, new products and services (or discontinuing products and services), new ways to serve markets, as well as changes to strategies. Some of these changes will surely stay beyond the end of the pandemic, but some may not. The duration of each innovation in a business or sector will be impacted by many factors, such as the availability of funds to make it sustainable, as well as its practical applicability in a post-pandemic world. One thing that is certain, however, is that closing the digital skills gap and upgrading employee skills will be essential for maintaining productivity in workforces of the future, and new technology can support assessing and upgrading employee skills.⁷³

Figure 6: Changes made by businesses to adapt to the COVID-19 pandemic, by business size



Source: Statistics Canada. (2020). Changes made by businesses to adapt to the COVID-19 pandemic, by business characteristics.

The surge in teleworking has required companies to use new technologies to enable regular business activities such as facilitating workplace collaboration.⁷⁴ The switch also creates potential for other fundamental shifts, for instance, to promote an evaluation of workers that is more outcomes-based rather than focused on traditional forms of supervision.⁷⁵ These shifts will require additional investments.

Along with a need to upgrade employee skills, there is also a need to re-configure workplaces so they are as conducive as possible to employee success and well-being. Indeed, while 55 percent of employers reported they had returned to business as usual by October 2020, 49 percent of

workers surveyed were seriously considering leaving their job. That's nine percentage points higher than the previous year.⁷⁶ And the World Economic Forum has announced the official recognition of burnout as a work-based syndrome related to chronic stress (it was formerly considered to be a problem related to life management).⁷⁷ Such stress has been increased for some workers, especially those with young children at home.⁷⁸

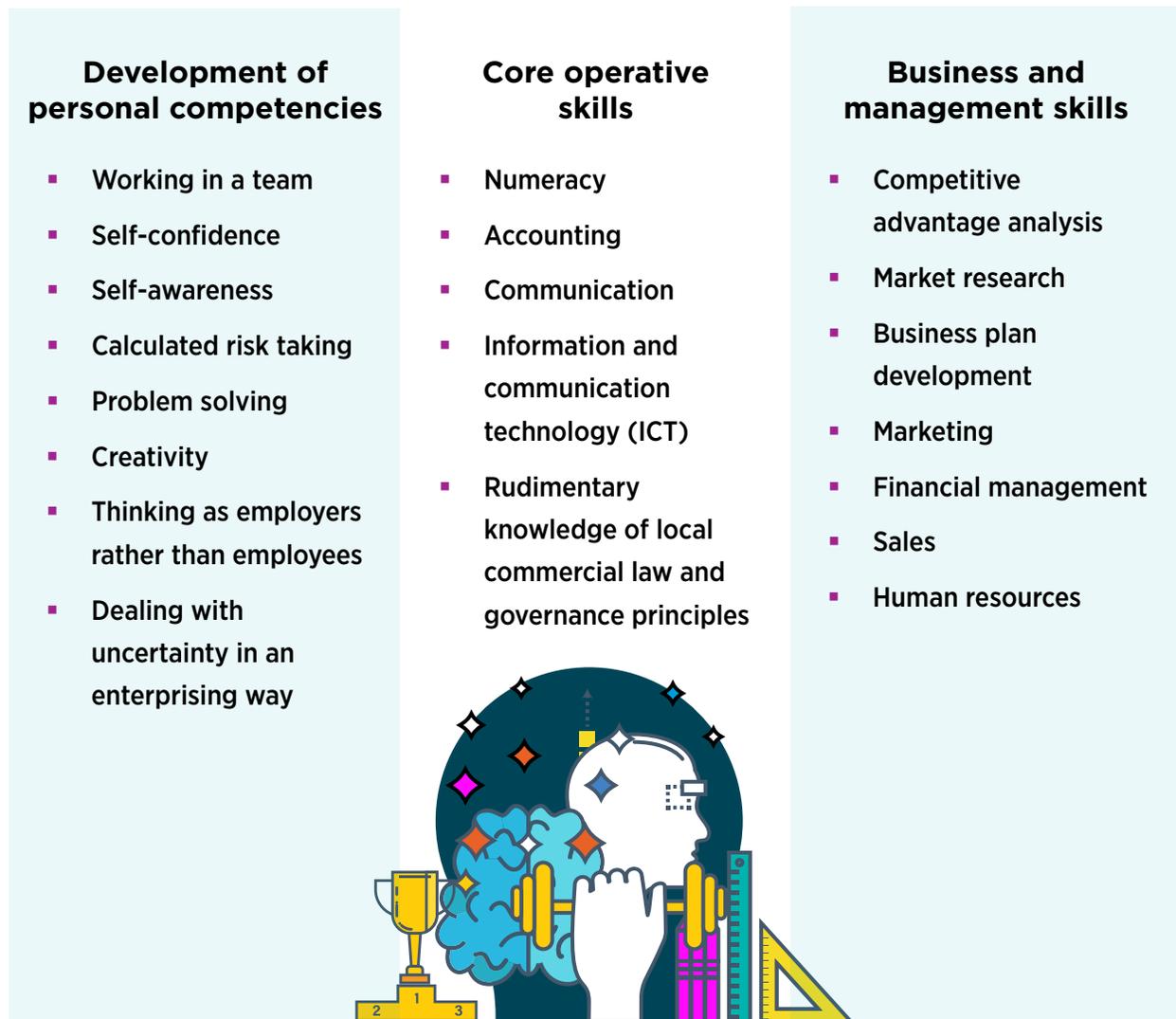
Teleworking may also increase the disadvantages faced by workers without access to space, or whose surroundings are crowded. Therefore, norms for telework need to be developed so that such workers are not stigmatized, and so that poorer remote working conditions do not become a barrier to acceptance in the remote workplace. It is important to maintain access to decent working conditions and appropriate mental health supports across income levels and different segments of the population. Technologies and appropriate and supportive digital skills training can help ease workers into changing digital conditions.

ENTREPRENEURIAL SKILLS AS ESSENTIAL SKILLS?

According to the **Global Entrepreneurship Monitor**, Canada has a relatively high level of entrepreneurial intent. Additionally, entrepreneurs and SMEs form a significant portion of employers. Access to entrepreneurial training and skills, however, is uneven and the programs available do not meet the needs of many women and diverse entrepreneurs. There is some evidence to suggest that entrepreneurial skills, whether or not someone ends up establishing a new business or social enterprise, serve people well regardless of the environment they end up working in. These skills include developing new ways of identifying opportunities, creating new combinations and gathering the necessary resources to implement solutions. Canada's new Skills for Success strategy stops short of including entrepreneurial skills as an essential skill but does prioritize related competencies such as continuous learning, as well as creativity and problem solving. Some countries – notably Singapore and, more recently, China – have prioritized the development of entrepreneurial skills in the formal education system.

The United Nations Conference on Trade and Development (UNCTAD) has described the ways in which many countries have mainstreamed entrepreneurship into the national curriculum.⁷⁹ It also defines the components of effective entrepreneurship training (see Figure 7), and notes that effective entrepreneurship curricula introduce experiential learning through interactive teaching methods that incorporate practical experience and encourage learning by doing.

Figure 7: The Components of Effective Entrepreneurship Training



Source: United Nations Conference on Trade and Development. (2012). Entrepreneurship policy framework and implementation guidance.

Several studies have identified gaps among Canadian businesses in terms of basic financial literacy and other core skills. In general, Canada has tended to rely on a combination of formal education programs and a growing number of experiential and modular learning programs through, for example, the country’s extensive network of incubators and accelerators. However, the area of entrepreneurial skills development is still the subject of considerable debate between those who focus on personality and neurocognitive traits⁸⁰ and those who focus on skills that can be taught and developed.⁸¹

INVESTING IN ENTREPRENEURS AND SMES

Before the arrival of COVID-19, Canadian employers were spending much less than their OECD peers on retraining and upskilling employees.⁸² The onset of the pandemic has only accelerated the pace of change, thus further increasing the importance of retraining and upskilling. While the need arguably existed pre-pandemic, it is clear now that there is a need in Canada for coordinated training programs for businesses that want to ensure their workforce is able to keep pace in the increasingly competitive global marketplace.

Certainly, before the arrival of COVID-19, some business leaders had kick-started investment in their workforces through fully private or public/private partnerships.⁸³ For instance, TD Bank committed to investing \$1 billion by 2030 to support Canada's workforce through times of technological change and RBC committed to investing \$500 million over 10 years to do the same.⁸⁴

However, the scale of upskilling and reskilling required post-pandemic is virtually unprecedented and it is clear that those with the greatest needs are not necessarily those with the resources that are required.

To understand why this is, it is worth taking a step back and considering the employment landscape in Canada. The vast majority (69.9 percent) of Canadians who work in the private sector are employed by small businesses, while 19.6 percent are employed by medium-sized businesses and only 10.5 percent work for large businesses.⁸⁵ Small companies also account for the majority of job growth in Canada. In the private sector between 2013 and 2018, 56.8 percent of job growth (or 590,800 jobs) came from small businesses, while 16.6 percent (172,663 jobs) came from medium-sized and 26.6 percent (276,677 jobs) from large businesses.⁸⁶ SMEs are critical in all sectors of the Canadian economy: nearly 1.1 million (two-thirds) of companies operating in the private sector have fewer than five employees.⁸⁷

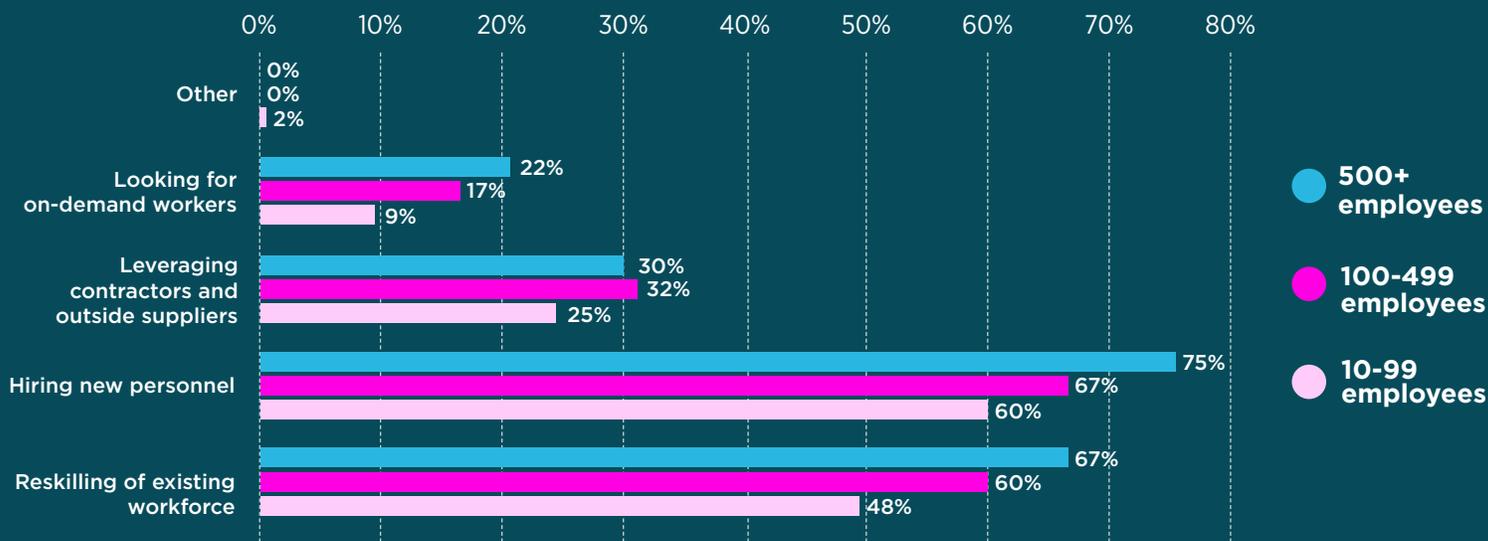
These micro businesses dominate most sectors, including construction, professional services, personal services, retail, health care, finance and insurance. Historically, they have faced critical labour shortages and skills gaps that threaten their competitiveness, both vis-à-vis larger organizations and other businesses globally. Small businesses have been the hardest hit by COVID-19, yet this has not reduced the demand for skills or certifications in specific areas. Surveys by different organizations repeatedly show SMEs reporting access to talent as a critical competitive issue. At the same time, there is also evidence that SMEs face challenges in the processes they employ to hire, retain and train talent. Often, they lack the human resources professionals and resources needed to support recruitment of highly skilled workers or for training, retraining and

upskilling existing employees.⁸⁸ The research also suggests they face challenges in retaining talent. In addition, there is evidence that SMEs’ hiring processes often present more barriers to women and other equity-seeking groups, in part because of SMEs’ heavy dependence on informal processes for recruitment.^{89, 90, 91, 92}

At the same time, there is considerable evidence that SMEs lag behind other companies in their implementation of strategies to upskill or reskill employees. For example, a survey by employment website Indeed shows 57 percent of SME owners find new employees through word of mouth.⁹³ Additionally, the Business Development Bank of Canada reports that many entrepreneurs resort to using less-qualified and younger workers to address labour shortages. They also try to improve efficiency by streamlining processes and making employees work longer hours.

As illustrated in Figure 8, it is clear that large businesses are more likely to have developed plans for sourcing and planning new digital skills through both reskilling their current workforce and hiring new personnel. In this regard, SMEs, and especially small businesses, would benefit from support in developing and implementing plans to ensure their workforce can meet the needs of the future of work.

Figure 8: How is your organization sourcing or planning to source new digital skills?



Source: Bouchard, J.P. (2020). [A Foundation for the Next Normal: Outlook of Technology Adoption and its Impact in the Canadian Workplace.](#)

It is clear that employers large and small understand they need access to talent with the skills required to support innovation and growth, but smaller organizations are less likely to plan to

invest in upskilling or reskilling their existing employees. Moreover, discussions of the skills in demand are often dominated by the voices of large companies, who account for only 10 percent of jobs in Canada. SMEs are often not even at the table.⁹⁴ Recent research suggests the needs of SMEs are distinct – particularly small businesses, which face the greatest challenges during the pandemic.⁹⁵ As noted previously, adoption of technology in SMEs has lagged considerably and the skills to support technology adoption are substantively different than those associated with technology development. Gaining an understanding of how SME needs differ from large organizations is required. New taxonomies are important to help distinguish between deep technology development skills, the skills needed to innovate with technology, and the skills needed to use the technology – and then the ways in which they can be assessed, developed and effectively utilized.

It is important to reiterate that entrepreneurs and SMEs are the engines of innovation and growth but less often the focus of skills and training discussions. Preliminary research suggests the skills needed to enable start-ups to thrive, scale and survive and those needed to help SMEs innovate and grow are substantially different than what appears on the usual skills agenda, which is often dominated by large corporations. Digital skills are important across the board, but so are management, financial and strategic skills – yet most SMEs lack the resources or the time to invest in them. New models to support SMEs are critical.

SKILLS FOR AGILE, ADAPTIVE LEADERSHIP: “STRATEGIC DOING”

For decades, governments have wrestled with efforts to become more innovative while managing risk and being accountable. Ironically, the risk management framework developed by Treasury Board almost 20 years ago was designed to encourage innovation by reducing risk, but there is little evidence it was successful.

New programs, “labs” and initiatives have been fostered to advance innovation but there is limited evidence of success. Some studies of efforts to innovate in large systems like health care suggest institutions react to innovation as if it is a virus that the institution’s immune system must do everything in its power to neutralize.⁹⁶

Yet, with COVID-19, what was viewed as impossible became possible – not just in terms of policies that would previously have been seen as impractical or costly, but also timeframes and deliverables that would have been considered impossible. Somehow, imperfect and messy as the process was,

government developed and launched programs in days and moved mountains of applications to get funding out the door. The way in which this was accomplished has yet to be fully documented and leaders at both the political level and in the bureaucracy doubtlessly have many stories to tell. Similar war stories have been told by businesses that had to design, build and implement new systems almost overnight. But, in principle, the skills required in this context seem to be those aligned with “Strategic Doing” or other iterative, lean models that create capacity to design, implement, get feedback and try again.⁹⁷

Additionally, the biggest impediments to flexible work have not been technical feasibility or demand but, more often, management approaches and a lack of the skills needed to supervise remote workers. Previously, many organizations had remote work policies in place, but this type of flexible working was seen more as a perk than a necessity or permanent feature of the workplace – in part due to a premium on “face time” but also due to fundamental assumptions that informed approaches to management and supervision.⁹⁸ Many employers and employees expect the new arrangements to continue. This has implications for the skills needed to manage remotely, as well as the supports needed, and will require a major shift in managerial approaches during and after the pandemic.⁹⁹

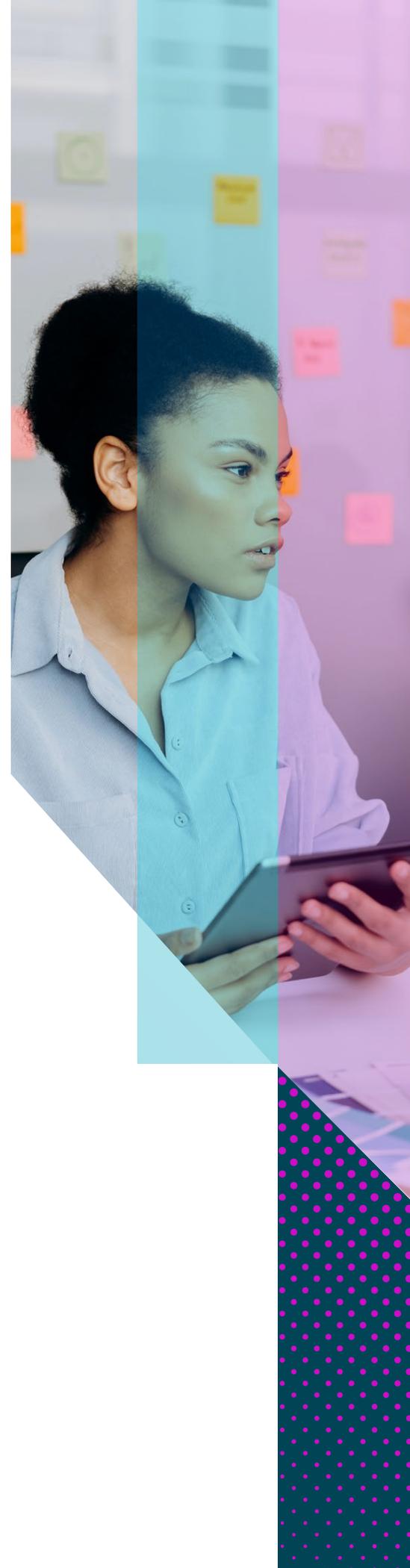
CONCLUSIONS

Before COVID-19, innovation was a preoccupation of governments around the world as well as bodies such as the OECD and the WEF. In spite of massive public investments in R&D and one of the best educated workforces in the world, Canada's innovation performance has been a cause for concern. The experience during the pandemic suggests that resistance to innovation and a failure to recognize the imperative to innovate may be one of the most important factors hampering Canadian success in this area.

The pandemic has decimated many sectors of the economy and created levels of unemployment from which it will take time to return to pre-pandemic conditions. Simultaneously, it has also spurred innovation across sectors and in different forms that present significant opportunities to “rebuild better.” With the disruption created in some sectors – with some transformed and others decimated – as well as massive growth of everything digital and virtual, it is understandable that the skills agenda is central to discussions of rebuilding the economy. COVID-19 has not only highlighted the critical importance of specific skills for specific roles that have changed or expanded, but also the skills needed to anticipate and respond to shocks to the system.

Among these skills are those needed to continue to transform both the public and private sectors and to create and scale entrepreneurial ventures: We need more than just the skills to develop and apply technology, we also need the skills to create and implement new strategies and new business models. Entrepreneurial skills are at the core of rebuilding better, referring to skill sets that are not just important to entrepreneurs, but that represent a different mindset that values resilience and agility and that can be adopted by workers across employment types.

In addition to a need to support widespread upskilling to ensure the workforce can meet the skills needs of future workplaces, there is also a need to support strategic initiatives that aim to



improve access to training and decent work opportunities for all Canadians. Diverse entrepreneurs and workers face barriers to success, including challenges in accessing training, financing and support to sustain success in the innovation space. We need to design programs in such a way that we can correct underrepresentation of many groups and capture the innovative potential of all Canadians.

In this context, assessing and consciously addressing skills gaps has become more important than ever, particularly the skills needed to continue to promote and consolidate gains from innovation in digital workplaces. The accelerated rate of digitization has definitely increased the demand for digital skills across sectors. The rise in technology-related skills on the WEF Top 10 list is but one indicator.

At the same time, understanding that digital skills include not just the skills to make new technology but to apply it and to “do differently” is at the heart of an innovation skill set.

New working arrangements have created massive challenges for some (especially women juggling home care, home schooling and work) and the blurring of boundaries between home and work has, for some, turned work at home into live at work. New skills are needed among both employers and employees to navigate these new arrangements, as it is clear that a return to normal may not mean a return to the office as it existed before the pandemic.

Governments will be left with much higher levels of debt well after the pandemic’s initial shock to the public finances has dissipated. Decades of deficit fighting have already been undone in about a year and it remains to be seen whether new austerity measures will follow the massive investments that were required to stabilize the economy during the pandemic. However, this creates new opportunities for rethinking investments in essential infrastructure, whether broadband or childcare. Former Unifor economist Jim Stanford, for example, has reframed investments in childcare through the lens of the multiplier effect, a concept previously reserved for auto sector jobs. And investments in skills development – whether for retraining or work-integrated learning – have never been higher. But these new programs and investments come with new needs for accountability and transparency.

Debates around inequality, diversity and inclusion have been brought to the fore and, more than ever before, organizations are prepared to name and confront systemic discrimination and anti-Black racism. The federal government announced an aspirational **50-30 Challenge** to encourage organizations to commit to seeking gender equality and greater diversity in leadership. While many aspire to do so, organizations – particularly SMEs – often lack the capacity, know-how and

tools to advance diversity and inclusion. And as we develop skills agendas, we need to ensure we apply a diversity and inclusion lens, recognizing that in some sectors and some jobs women, racialized people, Indigenous people and those with disabilities are disproportionately represented. Additionally, we need to continue to grapple with the fact that many employers are looking for skills in all the wrong places, overlooking important and underutilized talent pools or failing to provide the flexibility and accommodations needed by the full spectrum of candidates.

Lines have blurred between organizations and sectors. New approaches to collaboration have emerged, for example, with businesses banding together on joint marketing or distribution campaigns. Collaborations across sectors can leverage scarce public resources, but they require new skills and approaches, including skills needed to cross cultures. The rapid and increasing pace of change will require nimble action on the part of Canada's entrepreneurs. Governments at all tiers, non-profit organizations and post-secondary institutions all have a part to play in ensuring that Canada can meet a growing need for innovation across sectors in the decades to come.

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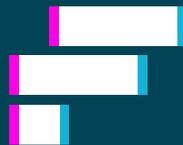
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