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State of Skills:

Unleashing AI into the skills development ecosystem

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KEY INSIGHTS



To reap the benefits that AI has to offer, its adoption and deployment should be a collaborative and inclusive process that recognizes and addresses genuine concerns individuals have about AI and technology more broadly. FSC projects have shown that such an approach can lead to demonstrable gains in efficiency and well-being.



The absence of an inclusive AI deployment strategy and disregard for its inherent biases risk exacerbating existing inequities.



FSC-supported AI tools have bolstered outcomes in skills matching, career development guidance, and recruitment. The overall effectiveness of these tools was underpinned by recognizing and mitigating the inherent bias and discrimination embedded into these technologies.



Given the breadth of AI's impact on the world of work, AI skills will become increasingly relevant. FSC and others are making efforts to strengthen basic AI skills and this should form a core component of digital literacy going forward.



The Issue



Artificial Intelligence (AI) is not like any technology that has preceded it.

Initially [defined](#) as the science and engineering of making intelligent machines, AI has evolved in recent years from a concept to a transformative technological force. Today, AI's definition has expanded to emphasize the replication of human-like intelligence in machines and involves agents acting and reacting in their environment to maximize, among others, decision making.

AI can be categorized based on abilities and technologies:

- [Generative AI](#) involves creating new content like images and text, going beyond mere replication of data patterns.
- [Natural language processing](#) focuses on the interaction between computers and human language, enabling chatbots and translation services.
- [Computer vision](#) allows machines to interpret visual information crucial for applications in facial recognition and autonomous vehicles.
- [Reinforcement learning](#) enables AI agents to learn through trial and error, optimizing a reward signal, and is key in autonomous robotics and recommendation systems.

Although still nascent in many regards, AI is already having a profound impact on most sectors of the economy and the world of work. In fact, ChatGPT-4 was leveraged to support the drafting of this insight, including shortening existing text; rewriting language to be more user friendly; prompting text to expand on initial ideas; and providing preliminary research questions in the field of AI.

AI's impact on employment is complex. It can automate routine tasks, potentially enhancing productivity and safety but may also disrupt job roles. The [OECD suggests](#) that minimal negative employment effects seen to date may be due to AI's current low adoption rates. However, advancements in generative AI could accelerate workplace adoption, potentially exacerbating negative employment effects over time. The [Bank of Canada](#) says high-skilled workers are increasingly vulnerable to digital technologies such as AI.



[The risk of job automation varies globally](#), and is more likely in high-income countries than low-income ones. While [AI will impact all jobs to varying degrees, more than 300 million global jobs could be affected](#). In Canada, AI tools, like ChatGPT, could perform nearly 20% of jobs in the future. But, these jobs are more likely to be transformed than fully overtaken, with [AI becoming an tool of the job](#). Occupations at high risk include technology, journalism, paralegals, and customer service roles ([Finlayson 2023](#); [Kelly 2023](#)). However, AI can also create employment opportunities in other fields or enhance productivity, as seen in countries with high automation but low unemployment rates.

According to the [OECD](#), the oversized impact of AI on the job market comes from the greater speed at which it is being developed relative to previous technological advancements, and its impact extending beyond non-cognitive and routine tasks, with implications for all occupations. AI is expected to disrupt employment levels, composition and skill requirements at a scale not seen with previous technological changes.¹ In fact, [Canadian business executives believe](#) that nearly 42% of the Canadian workforce will need to reskill to adapt to the growth of generative AI over the next three years. Similarly, a recent [IMF working paper](#) suggests that AI will affect 40% of jobs globally.

AI has the potential to stimulate innovation and productivity with tangible improvements across a wide range of economic activities. For example, AI is already transforming workforce development systems and mechanisms in positive ways, such as improving skills matching, skills recognition, and learning. Similarly, AI has begun to permeate education systems through its use in teaching, learning and research (both positively and negatively). Given the breadth of AI's potential impacts, it will be important to make sure individuals, especially those most vulnerable to technological change, have the right skill sets to leverage new and emerging employment opportunities and adjust to changing skills composition of existing jobs.

What We're Investigating



Our projects explored how AI impacts the skills development ecosystem.

[A series of research projects](#) co-funded with the Social Sciences and Humanities Research Council (SSHRC) on skills and work in the digital economy, included two projects on AI and the

¹ There is also the important aspect of ensuring appropriate regulations and guidelines to ensure ethical development and usage of AI which is behind the scope of this report.



[future of work](#) and [AI and equity](#). We also supported the Institute for Work and Health to explore how [AI workplace applications impact existing inequities](#).

Other projects are aimed to enhance AI skills among targeted workers and promote AI adoption for productivity growth. These included an effort to develop AI skills among [healthcare](#) workers and [mid-career professionals](#).

The Future Skills Centre also supported a handful of projects that explored how to use AI to improve [skills matching](#) and [address bias](#) in job posting.

Looking at these projects and the wider emerging evidence related to AI, this State of Skills report explores the potential impacts of AI on employment; the role of inclusion in AI adoption; and the importance of basic AI skills. The report also examines how AI might be used as a tool within the skills development ecosystem to ensure Canada benefits from technologies like AI, while putting in place systems and measures to address any negative consequences.

What We're Learning



Are job loss fears from AI overstated?

Discussions about AI's impact on the workforce often highlight fears about job displacement. Concern that automation and AI systems might replace certain jobs, including those using cognitive skills, these fears – at least for now – may be overstated. Historically, technological advancements have led to the creation of new job sectors and opportunities, even as they rendered some roles obsolete. Evidence so far suggests AI is likely to follow a similar pattern. Moreover, AI has the potential to complement human work, where its use is expected to emphasize the value of uniquely human skills like critical thinking and emotional intelligence, which AI, in its current form, cannot replicate to the same degree.

Yet, much like past technological innovations, the implications of AI on work could have an uneven impact on vulnerable groups. The research findings from the [IWH project](#) highlight that the jobs most likely to be impacted by AI are disproportionately held by women.



AI adoption, if done in an inclusive and collaborative way, can overcome human fears and lead to positive outcomes

Human apprehensions about the impact of AI on work and society can act as significant barriers to its adoption, potentially hindering the realization of its benefits. These concerns often stem from a fear of the unknown, including job displacement, loss of privacy, and lack of control over autonomous systems. Such hesitancy slows technological progress but also limits the exploration of AI's full potential in enhancing efficiency, driving innovation, and solving complex societal problems.

Indeed, FSC's funded project [SSHRC Artificial Intelligence and the future of work: What do we know so far?](#) demonstrates that organizations need to better consider employees' perspectives about implementing AI and not only the technical aspects of such a radical transformation. When introducing AI, organizations need to prioritize employee well-being and address power imbalances to facilitate and support change.

Against this backdrop, our collaboration with [Michener Institute](#) developed a set of AI skill sets and designed a series of educational and training interventions in collaboration with healthcare providers. The project showed that carefully designed education and training can help build user trust — a necessary ingredient to successfully implementing AI technology. Evidence from the project also showcased that actively engaging equity-seeking populations to co-create training and courses that fosters a culture of trust and transparency. By doing so, the project ensured that healthcare professionals were well-equipped to leverage AI in their work and consequently, led to enhanced diagnostic accuracy, streamlined workflows, and improved treatment plans. All of which ultimately improved patient care and outcomes.

Supporting AI upskilling

The transition towards AI adoption and integration necessitates a shift in workforce training and education, highlighting the need for lifelong learning and adaptation to changing technologies. Rather than jobs disappearing, it is [more likely](#) that workers will be replaced by other workers with better AI skills.

With this in mind, the FSC-supported project [From data to decision: AI training and professional certification](#) at the University of Montreal and the Institute for Data Valorization developed nine short, online courses on six different AI themes, training more than 3,000 people. The project contributed to the development and recognition of AI skills in Canada and beyond, and responded to current and future needs of the labour market. The project also offered a unique and flexible learning experience for professionals and leaders, who could customize their learning path for their needs and interests. The project also fostered



collaboration and innovation among academics, professionals, and learners, creating a network of AI experts and enthusiasts.

AI as an effective tool within the skills development ecosystem

Various sources of employment recruitment and job platforms have increased their use of AI for labour market matching. Job descriptions can be improved with AI through search engine optimization, assessing job advertisement readability, and the uniformity of language in multiple job advertisements ([Broecke 2023](#)). AI is also able to identify the skills, qualifications, and responsibilities often associated with a specific job title.

For example, [OpportuNext](#), created in collaboration with the Conference Board of Canada, is a free career tool that uses big data to match a person's skills with viable career paths. Using AI, it lets users quickly identify, and easily explore, promising career paths with predictive text.

There are some concerns about the use of AI in the career development space stemming from its potential to reproduce societal biases and inequities, reinforcing the marginalization of groups such as women, gender non-conforming people, and racialized people. On the other hand, because AI uses statistical prediction methods that can be audited, it has the potential to create outcomes that help those groups in situations where human predictions may be clouded by cognitive biases. AI can be explicitly programmed to check for and reduce racial, gender, or other inequality in predictions and decisions and help avoid the human bias that occurs in recruiting and selecting applicants.

Our partnership with [CivicAction on the HireNext](#) tool (now owned and managed by CharityVillage and TalentEgg) uses AI to provide practical recommendations for employers to improve the language around inclusivity of entry-level job postings. HireNext also offers proven best practices for hiring and retaining diverse talent. As of early 2024, more than 680 users from employers of all sizes and industries have accessed the free tool assessment and more than 1,000 recommendations have been provided.

In addition, as part of the [Future Skills Centre's Community of Practice](#) – which offers free access to resources, news, and events – we have hosted a series of workshops and [webinars](#) on AI for career development professionals to gain practical skills to use AI tools, like ChatGPT, to more efficiently deliver administrative tasks, training, counseling, and other client services.



Why It Matters



Halting technological progress is nearly impossible, so artificial intelligence is likely here to stay. AI is becoming a crucial part of our lives and is constantly evolving, making it hard to imagine a world without it. Indeed, AI is a transformative and cross-cutting technology that impacts nearly every occupation and sector, making it highly disruptive. Its widespread application means almost no job is untouched, from healthcare to finance, leading to significant changes in how work is done.

Proactive measures are needed to support this disruption and those most affected by job displacement. There is a crucial need for programs focusing on reskilling and upskilling workers, especially in sectors most susceptible to automation. Digital skills are now considered [essential](#), so the importance of AI literacy has grown considerably and not just for those in technology-related fields. Educating the workforce about AI, its uses, and its implications is vital in preparing them for an AI-integrated future, ensuring they are not left behind as the technology advances. Efforts should focus on using AI responsibly, making sure it is safe and ethical, and contributes to the greater good.

What's Next



Despite the overarching benefits AI offers, it is crucial to adopt it with caution and awareness, rather than pursuing it blindly or naively. Emerging evidence from our portfolio of projects, consistent with previous literature on technological adoption, show that while AI has tremendous upside potential, especially within the skills development ecosystem, there are significant distributional consequences to consider, particularly concerning equity-seeking groups. These groups, often already marginalized in various aspects of society, may face exacerbated inequalities due to the uneven distribution of AI's benefits and burdens.

Future activity in this area will include continued work with partners to monitor the rapidly evolving impacts of AI on work, paying attention to AI's impact on certain groups and how best to leverage it to combat entrenched inequities and discrimination, so that policies and



programs related to AI benefit the many, rather than the few. The Future Skills Centre will pay particular attention to the distributional impacts of AI and how skills development policies can help to ensure the economic gains of AI do not come at the cost of worsening equity.

Featured Projects

[HireNext: Artificial Intelligence \(AI\)-enabled Job Posting Tool, CivicAction](#)

[Accelerating the adoption of Artificial Intelligence in health care through building new knowledge, skills, and capacities in the Canadian health care professions, Michener Institute](#)

[OpportuNext, Conference Board of Canada](#)

[SSHRC Artificial Intelligence and the future of work: What do we know so far?](#)

[SSHRC An Equity Lens for Artificial Intelligence](#)

[From data to decision: AI training and professional certification, University of Montreal and the Institute for Data Valorization](#)

[Intelligent machines and human worker inequities: Examining the implications of artificial intelligence in the workplace, Institute for Work and Health](#)

More from FSC

[The labour market of tomorrow: projections from the Model of Occupations, Skills, and Technology \(MOST\)](#)

[The Skills Algorithm: Digital Skills Demand Across Canada's Labour Market](#)

[Virtualization of Experiential Learning Platforms and their Pedagogical Models](#)

[Race alongside the machines: Occupational digitalization trends in Canada, 2006-2021](#)

[Facing the challenge of digital transformation in the insurance sector: women at work](#)

[Building the Skills of the Trucking Industry for the Future Using Innovative Technology](#)

[Smart systems and digital technologies for a new era](#)



[Learning bulletin: Artificial intelligence: How is it shaping the future of work and skills](#)

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