The Role of Ontario Universities in Powering Economic Growth

A project commissioned by the Council of Ontario Universities

Acknowledgements:

Research services provided by the Business + Higher Education Roundtable

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27 October, 2021

EXECUTIVE SUMMARY

Universities help prepare students for success in highly skilled jobs. They also help employers access the talent that drives productivity and innovation and that ultimately make Ontario companies competitive. This report identifies four ways in which Ontario's universities are supporting short-term COVID-19 recovery and long-term economic development.

Interdisciplinarity: Universities are preparing students for a now we know and a future we don't

Universities produce highly skilled graduates with the hybrid and foundational skills that Ontario companies need to drive COVID-19 recovery and future growth. University programs in disciplines across the liberal arts and humanities focus on critical thinking, communication, creativity, leadership, and other in-demand and foundational skills. Moreover, a growing focus on interdisciplinary programming and experiential learning means universities are helping students develop broad transferable skills and knowledge that can address both current workforce needs and future unknowns.

Local Connectivity: Universities are fostering innovation and building local postsecondary-industry connections

Universities are important to local industry clusters. They help to attract and keep talent as well as promote productivity, innovation, and prosperity through industry collaboration. Entrepreneurial and innovation ecosystems have emerged in response to the strategic co-location of start-ups and established companies and local universities. The close proximity of universities and companies enhances collaboration and leads to new learning models within universities that directly respond to the training needs of companies.

Responsiveness: Universities are increasingly responsive to community needs

Universities across the province have partnered with industries and mobilized knowledge to address distinct community and industry needs. Amid COVID-19, universities supported the development and manufacturing of personal protective equipment (PPE) and the creation of online support services for post-secondary students and families homeschooling their kids.

Equity: Universities are helping to drive equity

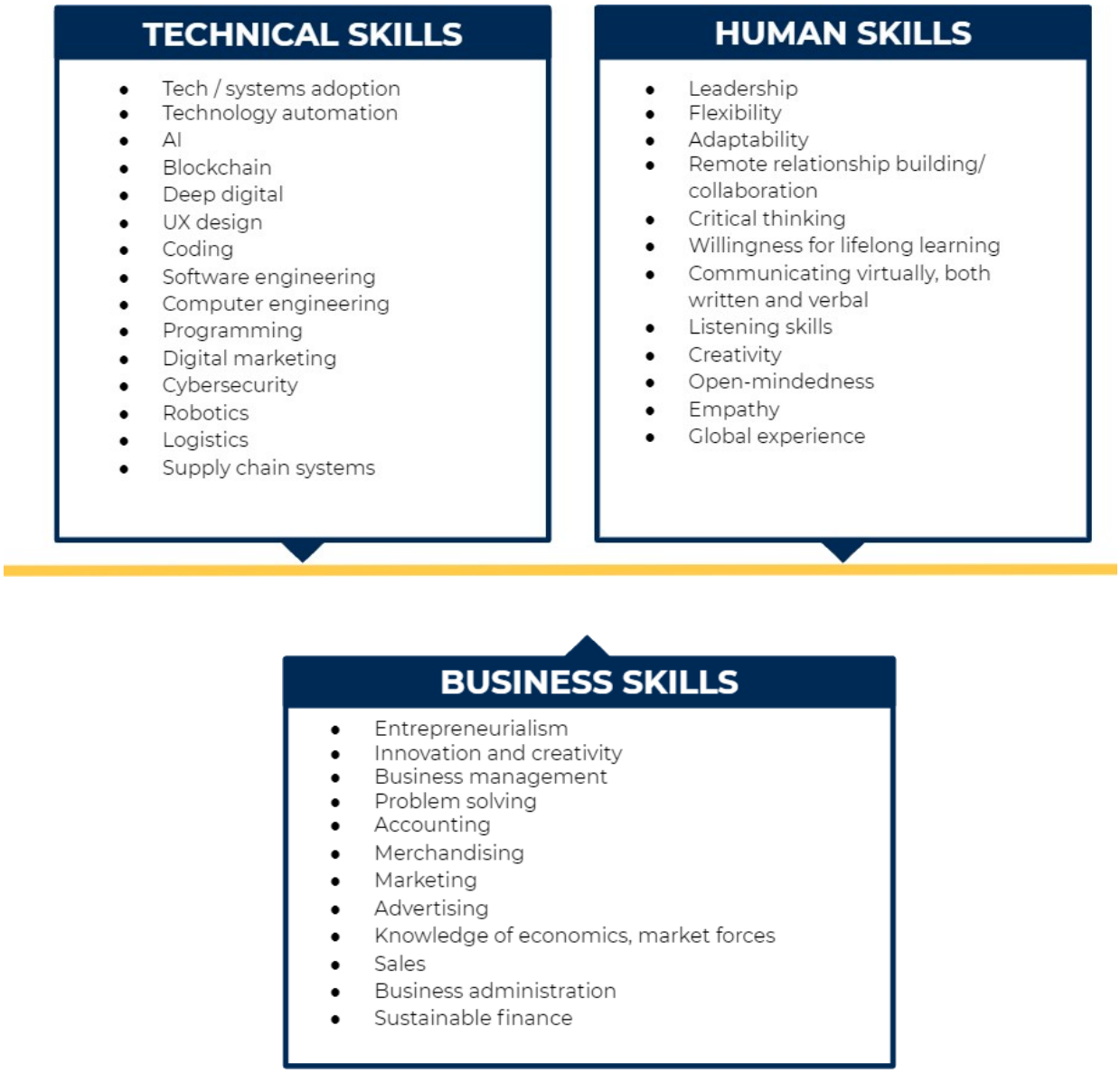
Equity, diversity and inclusion (EDI) matter to Ontario's companies. Ontario's universities are taking important steps to address the systemic barriers that women and other equity-deserving groups face in educational attainment. They are working to grow more diverse talent pipelines to meet the skills and innovation needs of Ontario's companies.

These four themes emerged from a detailed literature review and interviews with six industry leaders in Ontario.

1: INTERDISCIPLINARITY: Universities are preparing students for a now we know and a future we don't

Ontario's companies are experiencing labour market change due to the disruptive effects of the COVID-19 pandemic, emerging technological advancements, the country's energy transition, and ongoing demographic shifts. To remain competitive and drive growth, Ontario's companies need workers with hybrid skills from across three key categories (see examples below).

Figure 1: Skills cited by key informant interviewees



The industry leaders we spoke to identified the need for **social and emotional**, or **human skills**, such as communication, critical thinking and empathy (Giammarco et al., 2020). Given the shift to remote work and the impact of automation, interviewees also stated that **technical and digital skills**, like the ability to adopt new technologies and systems, were

important. Finally, **business skills and acumen** (Coady and Walker, 2020) are critical to companies in the wake of COVID-19 and the broad-based shift towards digital transformation and more complex, multi-stakeholder work environments.

Skills across all three categories are more important than ever in the shift to virtual and remote work. So too are **hybrid skills** - skillsets that span these categories and include a mix of foundational digital skills alongside non-digital human and interpersonal skills. This combination of skills enables workers to function digitally, while remaining adaptive, collaborative, agile, and resilient in response to industry disruption, and changing workplace and skill demands.

With the changing world of work, and how we don't necessarily stay in one industry or one specialization, even over our careers, having those base skills like critical thinking, strong communication skills, written verbal skills, and being able to problem solve and come up with solutions that can be applied to any industry - helps your ability to adapt and learn in new environments.

-Jennifer Wright, Canadian Agricultural Human Resources Council

That's been a notable employer need over the past five to seven years: these other in-demand "non-technical" skills, which people often call power skills, business skills, or communication skills. I like to refer to them also as key transferable skills – those that are needed for success from job to job.

- Sashya D'souza, Toronto Finance International

Industry leaders also spoke to the value of *interdisciplinary* approaches to learning and development - a growing focus within university programs - over more linear, highly specialized educational backgrounds. When brought to the workplace, inter- and cross-disciplinary backgrounds enable students-turned-new-hires to be more flexible and adaptive, to bring different perspectives to the table, and effectively apply their specialties in a diverse and changing workplace.

Interdisciplinary programs that are more combined and less specialized - giving students a good base where they have a specialization but they also understand how that specialization works within other disciplines. I think that those students will be the most in-demand, they will have the most flexibility, they will be able to adapt better, they will bring different points of view to their role.

The more we can connect with non-Ag [Agriculture] students and bring them into the industry, it's going to help, because you're bringing a different point of view and a different way of doing things to the industry.

-Jennifer Wright, Canadian Agricultural Human Resources Council

When our financial services employers go out onto campuses to attract talent, it's not just [about] appealing to students from traditional programs like business and finance. It's also very much [about] attracting computer engineers, coders, digital marketers, communications graduates. We need their skills as well, but they aren't always aware of that fact. Re-branding the sector and its opportunities continues to be a goal in our strategies.

-Sashya D'Souza, Toronto Finance International

Liberal arts programs bring cross-disciplinary and transferable value to non-arts professions like engineering and business through the hybrid skills profiles that they've developed:

Organizations are increasingly calling for skills like communication, remote collaboration, critical thinking, and creativity. Even if you're in engineering or business, gaining exposure to these skills through liberal arts pathways and classes will make you a much better engineer or business major.

-**John Stackhouse, RBC**

I hear more and more about the need to focus on those soft skills as a complement to the hard skills.

– Dianne Brisebois, Retail Council of Canada

In other words, it's not just highly specialized backgrounds that matter to firm competitiveness. Programs across the arts, humanities, and social sciences - the kinds of programs unique to universities - produce foundational skills like critical thinking and communication and are inherently valuable to the innovation, growth, and leadership needed across Ontario industries. This view is supported in the literature, which highlights a need for a broader understanding of the skills required for innovation and to move beyond a focus on STEM (Cukier et al., 2021). Through programs in arts and humanities, universities produce graduates with human skills, and provide the interdisciplinary education and development that meets the hybrid and future skill needs of Ontario companies, and that are important to future leadership.

Universities are critical to the provision of talent that we look to hire…. We continue to successively challenge [graduates] to move up the ladder and become more and more senior managers as they go. So, we are looking deep into our future. Every time we have an intake from universities, we're looking at our future leadership.

- **David Hudock, PCL Construction**

We hire directly from post-secondary education programs and have deep WIL [work-integrated learning] programs with colleges and universities. For the technical skills I mentioned (advanced technology like AI and blockchain, UX design, coding), those universities are crucial.

- **John Stackhouse, RBC**

A view that is widely held in our industry is that universities are critical to the future of Ontario and to Ontarians. The universities in Ontario are generally held in very high regard by the industry.

- **Diane Brisebois, Retail Council of Canada**

In their teaching and research, universities make students think deeply and critically to find meaning, seek out what is relevant to solve problems, to synthesize and communicate effectively, and to make sound evidence-based decisions.

Universities equip students to be comfortable with uncertainty, and give them the tools to tackle complexity. In this way, they address and train students not only to meet our current societal needs, but to develop the thinking, conceptual skills and knowledge needed to adapt to change (Boulton and Lucas, 2011; Newman, 1852). This view is shared by industry leaders:

A key in-demand skill sought by employers is critical thinking. University students are developing this skill throughout their education. Which gives them an edge in the workplace, for sure.

- **Sashya D'souza, Toronto Finance International**

Universities train students to go into the world with the general and specific skills necessary to advance the well-being of society. They also teach them to think in the theoretical and abstract, in areas of knowledge and inquiry that may not appear immediately relevant, but have proven potential to yield future benefits. In this way, the disciplinary breadth of universities lends itself to the demands of modern society.

Ontario's universities produced the scientists, public health professionals, and policy advisors that are on the frontlines in the battle against the COVID-19 pandemic.

Ontario's universities will continue to play a role in our ability to tackle complex cross-sectoral issues, be they future pandemics, poverty and food insecurity, the consequences of climate change or the development of new energy systems. These issues necessitate the kind of engagement across disciplinary boundaries that universities make possible (Forrant and Pyle, 2002).

The arts and science program at **McMaster University**, established in 1981, is an example of an interdisciplinary program that trains students to tackle global issues. It focuses on learning through inquiry in an interdisciplinary context, tying together areas as diverse as math and music (Hudspith and Jenkins, 2001). The curriculum is designed to develop skills in writing, speaking and critical reasoning, and to teach students to apply the art of scholarly inquiry to issues of public concern. It emphasizes social awareness and the development of a wide range of transferable skills to ensure graduates can formulate and answer their own questions and develop the capacity to become engaged citizens. Graduates have gone on to tackle complex global issues like urban malnutrition (Purdon and Palleja, 2021), create a code of ethics to guide the application of artificial intelligence (AI), and fight on the front lines of the current health crisis (Favaro et al., 2021).

In their broad orientation, universities address both current workforce needs, as highlighted by our industry experts, and future unpredictability, preparing students for the knowledge and innovation that will be important for long-term economic growth (Boulton 2015). In this way, universities create adaptable and resilient learners, ensuring that our education systems address but also transcend the immediate skills needs of the economy.

2: LOCAL CONNECTIVITY: Universities are fostering innovation and building local post-secondary-industry connections

Universities attract highly skilled talent who in turn create entrepreneurial ecosystems (Breznitz and Zhang, 2021). Together, they contribute to regional growth and longer-term economic development (Florida, 2002; Berry and Glaeser, 2005).

Carleton University and the **University of Ottawa** have drawn top graduate students in computer science, information technology and software engineering, stimulating the local

industry (Andrew et al., 2009). In Kitchener-Waterloo, an influx of international students to the **University of Waterloo and Wilfrid Laurier University** has helped foster a dynamic local labour market in specialty foods, products and services in the region. This has led to the emergence of vibrant ethnic communities that in turn encourage students to remain after graduation (Bathelt et al., 2009).

Mike Lazaridus, who co-founded Research in Motion (now Blackberry) in Waterloo in 1984, has emphasized the important role local students play in technology commercialization in the local technology industry (Vinodrai, 2016).

Universities are key elements in local industry clusters, which promote productivity, innovation, and economic prosperity in firms and regions (Krugman, 1991; Martin and Sunley, 2003; Gertler and Wolfe, 2006; Wolfe and Gertler, 2004). Michael Porter defines clusters as:

> Geographic concentrations of interconnected companies and institutions in a particular field that compete, but also cooperate. Clusters encompass an array of linked industries and other entities important to competition (1998, pp. 7-13).

The crux of the cluster concept is that the co-location of institutions and actors facilitates mutual learning and knowledge exchange. Clusters act as a centripetal force to attract skilled people, companies, knowledge, and capital to a region and drive innovation.

The Kitchener-Waterloo-Toronto Corridor is an iconic example and the second-largest technology cluster in North America behind Silicon Valley. It brings together some 16 Ontario universities and colleges, 15,000 technology companies (including over 5,000 start-ups) and almost 300,000 high-tech workers (The Corridor, 2021). Local universities like **University of Waterloo**, **University of Toronto (UofT)** and **McMaster University** have shaped the cluster's emergence and vitality through knowledge exchange, talent development and attraction, and new venture creation.

Beyond the largely urban context of Canada's Technology Triangle, universities strengthen innovation in Northern Ontario's mining cluster. **Laurentian University** has helped make the cluster one of the most advanced regional innovation systems in Northern Canada, giving Sudbury the reputation as the "Silicon Valley of hard-rock mining" (Hall, 2017).

Organizations that locate near universities derive many innovation benefits. A study looking at Toronto's biomedical industry underscores the innovation advantages for companies located close to the **UofT** and the cluster of teaching hospitals in the MaRs Discovery District (Gertler, Vinodrai and Rekers, 2008). Also located here is the Vector Institute. This organization, dedicated to research in AI, is a key actor in the local industry, and has been flagged by the Brookings Institute as a leading AI cluster outside the US (Muro and Lui 2021). Nearby AI and biomedical firms benefit from a critical mass of competitive success - knowledge exchange, relationships, motivation - around **UofT** and MaRs.

Companies benefit from the deep labour markets and talent pools universities help create. Research into Ontario's banking sector indicates that large firms like RBC locate their operations near universities in Toronto and Southern Ontario to tap into the local talent supply. As one industry leader put it:

We're a big believer in the power of clusters. So, we locate jobs based on a number of factors: post-secondary education being one of them. We still have the bulk of our jobs in Toronto, because of the cluster of strong universities, both in the city but also within a reasonable radius. [This] means that there is a very strong talent pool, in all areas. That can be in marketing, digital, sales, revenue generation, investment banking. You get the full venue of talent in Toronto and Southern Ontario, in large part because of the universities.

- **John Stackhouse, RBC**

Likewise, Bathelt et al. (2009) discuss the importance of **University of Waterloo** and **Wilfrid Laurier University** as suppliers of talent to local technology firms in Waterloo. This is reinforced through the co-op education programs recognized as pillars of the **University of Waterloo** success story. Many students find jobs at local companies (Vinodrai, 2016; Spigel and Vinodrai, 2020), reinforcing the role universities play as talent pipelines for local industries.

The location of companies near universities facilitates close collaboration to support the development of new learning models that address industry needs. **Carleton University** has partnered with Shopify, the leading Ottawa-based e-commerce platform designed for small to mid-sized enterprises (SMEs). The program pioneers a new model of curriculum-aligned work-integrated learning (WIL) opportunities that embed students in an industrial environment, allowing them to pursue a four-year degree in computer science while working over 3,000 paid hours at the company. Students work on real Shopify software projects for clients, providing innovative ideas and fresh perspective, while the company supports the creation of long-term talent pipelines (Lord, 2016). Shopify has also partnered with **York University** to expand this program to computer sciences students in the Greater Toronto Area (York, 2018).

Additionally, universities are partnering with industry to enhance the quality of life of residents in their communities. **Trent University** has partnered with the Ontario-based retirement home company peopleCare Communities to build a not-for-profit university-integrated Seniors Village that will provide both hands-on learning and training opportunities to students and create 224 new long-term care beds to help meet regional demand (Trent, 2021).

3: RESPONSIVENESS: Universities are responsive to the needs of their communities

In the face of COVID-19, universities expanded virtual learning options, providing access and continuity for students who might not have been able to continue their studies (Russek et al., 2021, p. 16). Universities also pivoted towards technology-enhanced and virtual academic, career counselling, and mental health supports. They implemented health and safety measures and provided PPE.

Universities have also been responsive to the needs of companies and communities. As the province emerges from the COVID-19 crisis, universities are working with local industries to mobilize research to enhance recovery efforts and address local needs. Here are some examples:

- The **UofT's** Dalla Lana School of Public Health developed an online interactive tool to help hospitals plan for COVID-19 by determining the maximum caseload of COVID-

19 patients they can handle (Kalvapalle, 2020).

- To help families with children, **Lakehead University** launched free courses for community members that provide expert advice on parenting, learning at home and managing anxiety, as well as free live and on-demand webinars (Lakehead University, 2020).

- **Nipissing University** has unlocked funding and concentrated research resources to conduct 10 projects examining the pandemic's effects on North Bay with the aim of contributing to the local recovery of the community (Lee, 2020).

- **OCAD University** partnered with local physicians during the COVID-19 vaccine roll-out to launch the Button Project with the goal of helping Toronto's marginalized populations access accurate and easy-to-understand vaccine information through a scannable QR code worn by physicians (OCAD, 2021).

- **University of Windsor** researchers helped Windsor-Essex residents access the COVID-19 vaccine through the development of an easy-to-use smartphone app that helps residents identify nearby pharmacies administering shots (Windsor, 2021).

- Many Ontario universities mobilized research to support local production of PPE early in the pandemic. For example, a team of students and faculty members at **Queen's University** donated time and expertise to organize the 3-D printing of masks and face shields (Carroll, 2020). **Brock University** used 3-D printing technology to produce face shields for local health-care workers (Dakin, 2020). Engineers at the **University of Ottawa** have been building and printing protective gear (about 300 masks a day) for frontline health-care workers through the Makerspace group (Gergyek, 2020). **Ontario Tech University** has designed and manufactured face shields that are shipped to hospitals in the Durham region (Ontario Tech, 2020). The **University of Guelph** supplied ingredients to create up to 2,000 litres of hand sanitizer to help Dixon's Distilled Spirits pivot operations from producing liquors to bottling much needed hand sanitizer for local frontline workers. The product has been distributed to essential workers in medical clinics, the local fire department, and the local OPP dispatch centre (University of Guelph, 2020).

The COVID-19 pandemic has created opportunities for Ontario's universities to be both entrepreneurial and responsive to the needs of their communities. In a post-COVID-19 world, universities have a role to play to ensure that Ontario recovers from the pandemic with a stronger, more resilient and inclusive economy.

4: EQUITY: Universities are helping to drive equity

Diverse teams and inclusive workplace cultures not only foster belonging, happiness, and engagement – they continue to strengthen talent, mobilize a larger spectrum of ideas and experiences, keep organizations relevant, and drive innovation. Universities feed these talent pipelines and can be a tool to help employers tap into untapped talent to develop talent in the upstream to meet the skill needs of companies in the downstream.

But this means universities themselves must make strides to enhance equity, diversity, and

inclusion within post-secondary systems: to improve outcomes for current students and future workers from equity-deserving communities.

While many communities continue to face systemic barriers to university access and achievement, universities across Ontario are striving to dismantle them. This includes efforts to build up institutional capacity for inclusion in teaching, learning, research, community engagement, and governance; recruiting and retaining more diverse students, staff, faculty and leadership; and advancing the integration of EDI principles, policies and practices into research, teaching, learning, alumni relations and community outreach.

While there's still much work to do, inroads are being built. Ontario success stories we can look to include:

- **Laurentian University.** The Indigenous Student Affairs office works with Anishinaabe Elders to integrate Anishinaabe perspectives in academic research and help to frame research in ways that acknowledge and contribute to Anishinaabe knowledge (Laurentian University, 2021).

- **Ryerson University.** The Office of the Vice-President, Equity and Community Inclusion (OVPECI) provides strategic leadership and support in embedding EDI in all aspects of the university's mandate and operations. This includes the implementation of EDI values, priorities and strategies across programs and activities, expertise and advice on inclusive curriculum, pedagogy, and the collection and reporting of EDI data to track EDI-related outcomes and impact (Ryerson University, 2021).

- **Queen's University.** The school's Faculty of Health Sciences launched an EDI fund to help integrate equity priorities into curricula, research projects, professional development opportunities, and university culture (Queen's Communications, 2018).

- The "Hydro One Women in Engineering University Partnership" between **Ryerson University**, **University of Waterloo**, **Western University** and **Ontario Tech University**. The group has worked together to increase women's enrolment in engineering programs at the four universities by 65% and increased the number of applications from women to Hydro One's training program by 256%. The partnership has supported close to 19,000 students to date (Universities Canada, 2019).

- **Algoma University.** In partnership with Shingwauk Kinoomaage Gamig, Algoma University offers courses and programs that are culturally relevant and of interest to Anishinaabe students and in doing so, seeks to reclaim the space and legacy of the former Shingwauk Indian Residential School. These courses and programs are fully credited through **Algoma University** or other partner institutions (Algoma University, 2018).

- **Carleton University.** Launched in 1990, the Paul Menton Centre (PMC) at Carleton University co-ordinates a wide range of support services for students with disabilities academic accommodations, equipment loans, financial resources, counselling, learning strategy support, and mentorship. Together with the university's Research, Education, Accessibility and Design (READ) initiative, the

PMC offers employment programs, like the Accessible Career Transitions initiative, to students and alumni (Carleton University, 2021).

- **University of Toronto.** The Community of Support (COS) initiative, launched in March 2017, works to increase the number of medical students who identify as Indigenous, Black, Filipino, economically disadvantaged or who have a disability. The COS provides students with admissions information, access to mentors and support at each stage of the application process (University of Toronto, 2021).

- Medical students at **Western University** created the LGBTQ+ Mentorship Program to help provide a safe, inclusive and positive environment for medical students who identify as LGBTQ+. The program matches student mentees with faculty members and resident physicians who also identify as LGBTQ+ to help foster community both within the program and the profession (Western, 2021).

Programs and initiatives like these have helped to increase the diversity of talent entering universities and the supply coming out. Some wins: women between 25 and 34 are 17% more likely to obtain a post-secondary degree than men (Edge et al., 2018). In Ontario, 55.3% of 2020 post-secondary graduates were women (Statistics Canada, 2020). Though women are less represented in STEM programs (Edge et al., 2018), they made up 61% of arts and humanities graduates coming out of Canadian universities in 2017 (Trading Economics, 2021).

Ontario students are also completing their degrees with lower debt than students from some other provinces (Usher, 2021), despite higher tuition costs in Ontario when compared to some other provinces. This suggests that Ontario student aid programs may be filling financial gaps that help to enhance university accessibility, particularly for students from lower income families.

An ongoing challenge: the growing diversity coming out of universities is not always reflected in the workforce. For example, women are still under-represented in senior leadership roles in Canada and the workforce as a whole (Edge et al., 2018), and the COVID-19 pandemic has served to entrench existing inequalities in the workplace, pushing women - especially racialized women - from positions of power or from full participation in high-wage, high-growth sectors that are also critical to Ontario's recovery (Russek et al., 2021; Sultana and Ravanera, 2020; Ohm et al., 2020).

The role Ontario's universities can play to drive equity remains a relevant one. Ontario's industries need the increasingly diverse talent supply coming from universities to drive innovation and economic growth. Universities are moving in the right direction - though there is still work to do.

5: CONCLUSION

Universities build talent pipelines, local industry clusters, and community connections. They help drive equity by making inroads to address the systemic barriers that women and other equity-deserving groups face in educational attainment. After the pandemic, like before, employers will continue to rely on universities to produce diverse talent with interdisciplinary backgrounds to help their businesses recover and grow, while contributing to a more

resilient, inclusive, and sustainable post-COVID-19 economy.

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