Enabling Learning for Life: New Realities for Work and Education

Canadian version

Contributors

LEAD AUTHOR:

Malika Asthana	Senior Manager, Strategy and Public Affairs, D2L

CONTRIBUTORS:

Brendan Desetti	Senior Director, Corporate Strategy, Markets, D2L
Dr. Cristi Ford	Vice President of Academic Affairs, D2
Emilee Irwin	Vice President, Strategy, D2L
Mark Schneiderman	Senior Director, Strategy and Public Affairs, United States, D2L
Mike Semansky	Senior Director, Strategy and Public Affairs, Canada, D2L

INTERVIEWS:

A thank-you to the 15 leaders in education who took the time to speak with us and shape the perspectives and recommendations included in this whitepaper:

Dr. Ailsa Craig	Special Advisor on Continuing Education, Memorial University of Newfoundland
David Agnew	President, Seneca Polytechnic
Denise Amyot	President and Chief Executive Officer, Colleges and Institutes Canada
Professor Elizabeth Johnson	Deputy Vice Chancellor Academic, Deakin University
Dr. Gavan Watson	Vice-Provost of Teaching and Learning, Queen's University
Dr. Gervan Fearon	President, George Brown College
Dr. Julie Uranis	Vice President, Online and Strategic Initiatives, University Professional and Continuing Education Association
Dr. Meric Gertler	President, University of Toronto
Dr. Misheck Mwaba	President and CEO, Bow Valley College
Dr. MJ Bishop	Vice President for Integrative Learning Design, University of Maryland Global Campus
Rob van Ouwerkerk	Head of Academic Programmes and Follow-up Training, Faculty of Medical Sciences, University of Groningen
Dr. Sean Gallagher	Founder and Executive Director of Center for the Future of Higher Education and Talent Strategy, Northeastern University
Dr. Shawnda Floyd	Provost, Dallas College
Professor Simon Barrie	Deputy Vice Chancellor and Vice President Academic, Western Sydney University
Dr. Vivek Goel	President, University of Waterloo

Table of Contents

Introduction

The scale, speed and scope of adoption of artificial intelligence (AI), automation and digitalization are disrupting industries globally and transforming the nature of which jobs are designed to be done by humans and which may be taken over by technology.

Our life paths are shifting away from the traditional straight line—from 20 years of pre-career education followed by 40 years of work and then retirement. Longer lifespans leading to longer work lives along with transformational technological advancements will require people across industries, professions and geographies to engage in continuous learning. More adults will face multiple career transitions, growing the demand for workers to continuously acquire and demonstrate new skills throughout their lives. Moreover, as applications of generative AI continue to proliferate, a change to how people both work and learn is required. Learning must be about life and work, and life and work must be about learning. For that to happen, learners need easy, continuous access to affordable, relevant and industry-aligned learning that they can seamlessly start and complete as needs arise, often while continuing to work. The reality is, however, that our current systems of education and workforce development remain in the early stages of adapting to workforce changes.

To prepare people for jobs that don't yet exist, an ecosystem approach is required that reflects the interdependence of all stakeholders in the system: learners, employers, education and training providers, governments, and more. This year's whitepaper builds on a series of reports D2L has published over the past five years on the future of work and learning, and it specifically explores the challenges and opportunities

higher education institutions face in meeting the moment and will answer the following questions:

- According to working-age adults, what is the perceived value of continuing education? Is there a difference in how they perceive and consider certificate and micro-credential offerings from higher education institutions and other training providers?
- How are higher education institutions thinking about their role in workforce development and serving working learners?
- How and why have institutions introduced and scaled micro-credential programs?
- And finally, what supports should governments provide to individuals, employers and higher education institutions as they change to better meet the workforce upskilling needs and challenges of tomorrow?

There is considerable excitement, interest and activity around the potential for nondegree credentials—including badges, company-issued certifications and micro-credentials—for serving the needs of learners looking to upskill and employers looking to hire. However, the reality is that conversations about the value to learners and employers alike are still in the very early stages and slowly building momentum toward a more widespread transition to employers dropping degree requirements for jobs that do not require them.[i]

Rewiring learning for life—not "once and done" but dynamic

If it is possible to live to well over 100 years of age, what does that mean for our working—and learning—lives?

The traditional remit of higher education institutions has followed a linear approach to learning; typically, an individual goes through primary and secondary school, followed by an optional two, four or six years of higher education before they join the workforce. However, this approach to skills development is increasingly out of step with the realities of life and work today.

Demographers estimate that by 2050, reaching the age of 100 will be routine.[ii] Population aging is becoming the most pervasive and dominant global demographic trend, owing to declining fertility, increasing longevity and the progression of large cohorts into older age groups. The Organisation for Economic Co-operation and Development (OECD) has projected that the ratio of the old age to working age demographic (i.e., those aged 65 and over as a proportion of those aged 20 to 65) will rise from 22% to 46% in 2050.[iii] This increase in longevity is creating new imperatives—and opportunities—for older workers to remain engaged in the workforce longer.[iv]

The "future" of work and learning is not looming in the distance but a reality of the here and now.

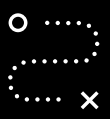
- D2L, The Future of Lifelong Learning, 2019

We are already seeing headlines about these issues, with governments around the world reckoning with social backlash about raising retirement ages to account for increased longevity and strains on public employment services, most notably in France.[v] For older workers to remain in the labor market, steps must be taken to ensure they have quality employment prospects—eliminating age-based discrimination in the workplace, investing in the training of older workers, and adapting working hours and conditions to fit their needs. Importantly, with longer working lives, the idea of a "once and done" approach to front-end formal education that will sustain a 30-year career without the need to return to upskill will need to be turned on its head. If we live 100-year (or longer) lives, our working lives could conceivably extend to 60 years long and will include more frequent job transitions as skills needs and technology adoption require. As generative AI tools become more sophisticated in the years to come, the ongoing conversation about what skills will remain best done by humans instead of technology will evolve. No profession or industry—from software development to content creation to legal services to financial analysis—is immune to the impacts of automation.[vi] To meet the disruption that lies ahead, we need a robust lifelong learning system capable of serving individuals not just up to their initial entry into the workforce but also throughout the span of their careers and beyond.

Dr. Michelle R. Weise, author of *Long Life Learning: Preparing for Jobs That Don't Even Exist Yet,* has called this the shift from a paradigm of distinct stages of "learn, earn and rest" to a more integrated approach of *learning while earning*, interspersed with *periods of rest as life happens*—from job changes to health changes to family changes. A system that will meet these challenges should include on-ramps and off-ramps to education opportunities throughout an individual's life to support him or her in maintaining a lifelong learning mindset that builds resilience to external shocks and makes them less vulnerable to long-term unemployment. In this whitepaper series, we refer to this as a learning-integrated life, where individuals are always in a learning mindset and intensive and episodic opportunities for learning are woven throughout the fabric of our lives, preparing them for successful careers and rich experiences. Importantly, this learning-integrated life should be available to all—regardless of prior education attainment, income level or prior work experience.

We are not fully in the linear life today, nor have we moved fully toward the learning-integrated life. The reality is we are somewhere in between, with a proliferation of credentialing opportunities available to adult learners for continuous upskilling but absent a cohesive system that is navigable, accessible, affordable and seamless for individuals. The challenges that lie ahead are systemic and structural and are a shared responsibility of education and training providers, employers, and governments, each responsible for accelerating the shift to a learning-integrated life. Recent research from the Lumina Foundation found that in the United States, 37% of college students are 25 or older, 64% of college students work and 24% have children or other dependents.[vii] As the profile of the stereotypical traditional-aged learner out of high school changes, so too do the traditional expectations of a higher education institution. Institutions are adapting to this new reality by investing in continuing education offerings; introducing and scaling micro-credentials; thinking holistically about the student experience, including wraparound supports; and developing deeper and longer-term partnerships with employers. However, most traditional institutions whose major revenue lines have been historically based on degree-based students are in the very early stages of designing industry- and skills-aligned offerings that can support adult learners in upskilling.

This reality is reflected in the perceptions of individuals. Individuals generally express interest in pursuing skills development opportunities that are affordable and accessible, but they do not have a clear preference for higher education as the provider of either soft skills or professional/technical skills development. Instead, they prioritize flexible, affordable and navigable on-ramps to support their current and future skills needs.

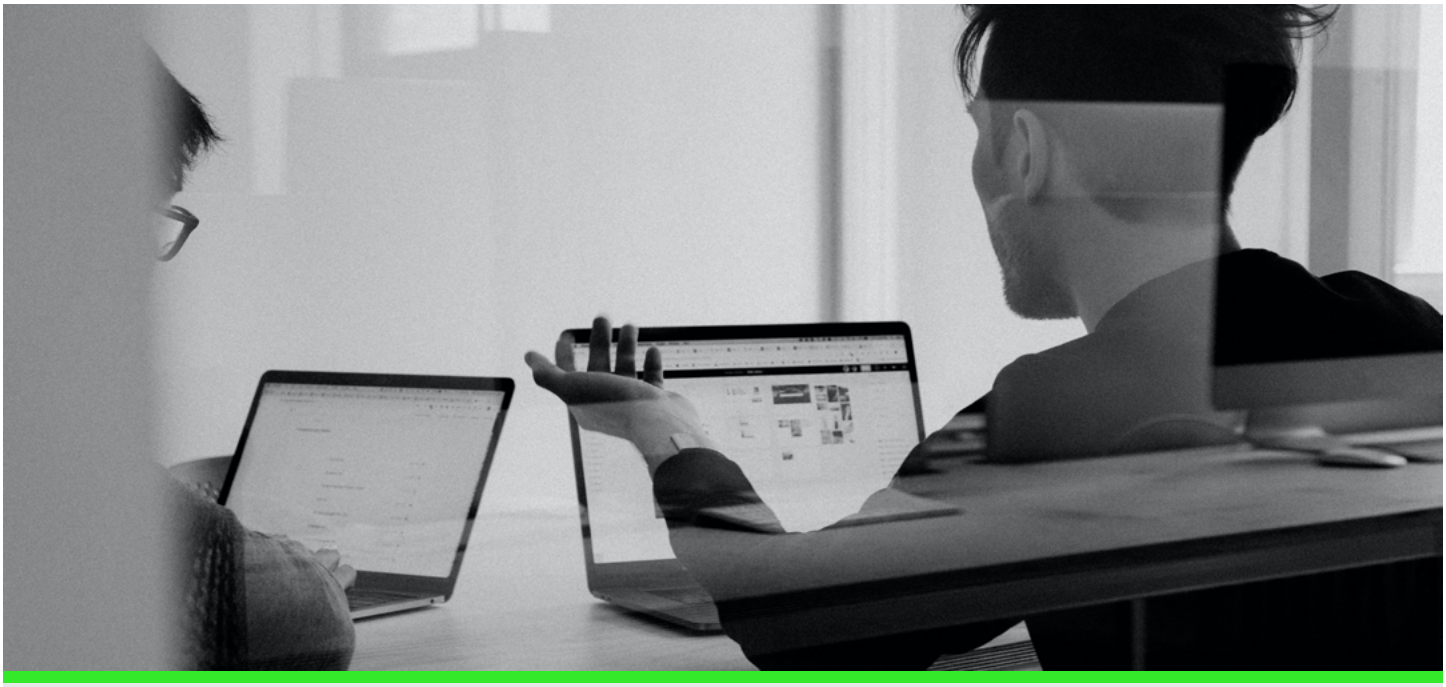


Traditional Linear Life

Learning-Integrated Life

	Traditional Linear Life	Learning-Integrated Life
1.	Three distinct stages: learn, earn, rest	Overlapping and interspersed learn, earn and rest periods
2.	Plan to retire in the 60s	Longer working lives
3.	Long continuous period of work, in a single career path with just a few company changes	Multiple entries into and exits from work (portfolio career—different companies and career fields)
4.	Education at the front end, often in pursuit of a degree-based credential	Seamless on-ramps and off-ramps to continuously upskill and reskill
5.	Educational institutions primarily responsible for learning	Learning happens within and outside formal education
6.	Generally two major transitions: education to career, and career to retirement	Multiple transitions as life happens
7.	Sequence and predictability of careers	Jobs of the future may not exist yet
8.	Professional advancement tied to generally predictable pathways	Diversity and complexity of pathways based on skills

Adapted from "Higher education for a changing world: Ensuring the 100-year life is a better life," Deloitte Australia, 2018.[viii]



Methodology

For this year's paper, we wanted to better understand the views and intentions of working-age adults in relation to pursuing further education and training. We conducted a survey of adults aged 18 to 65 in both Canada and the United States. We asked about:

- their motivations and perceptions around further education and training
- their preferred providers of education, and key deciding factors when considering programs
- the main barriers preventing them from enrolling in new programs
- the types of support that would most support them from completing new programs

The surveys were conducted by Innovative Research Group in December 2022 and are nationally representative for a sample size in each country of n=500 across age groups, genders and regional distributions. Our survey provides a point-in-time view of the minds of working-age adults spanning industries and age demographics.

To supplement our understanding of the current state of our transition to the learning-integrated life, we also conducted 15 interviews with executive-level leaders at colleges, polytechnics and universities in Canada, the U.S., the Netherlands and Australia to hear about their perceptions of future challenges and opportunities, their perspectives on micro-credentials and their recommendations for the path forward.

Key findings

1.

Continuous upskilling is not the norm—yet. Less than half of working-age adults surveyed had taken any professional development education or training over the past year.

Of Canadian adults, 83% expressed some interest in pursuing additional skills training over the next 12 months.

Over the past 12 months, 39% of Canadian adults had taken some kind of structured or formal education or training—a course, professional development program, apprenticeship or boot camp.

Of Canadian adults, 35% were working toward or had received a degree, certificate, professional certification or license, or micro-credential in the past year.

2.

There is no clear preference for training providers among working-age adults looking to build job- or industry-specific skills.

Of Canadian adults, 30% would seek training from their current employer to build these skills, and 22% would look for training from a professional organization, association or union.

Of Canadian adults, 25% would consider taking a course at a college or university to build those skills, while 23% would look for online courses or certificates from a company.

3.

Micro-credentials may hold promise, but there is a lack of consensus in defining what they are.

Of Canadian adults, 30% simply didn't know how to describe what a micro-credential is in response to an open-ended question.

Of those who did provide descriptions:

- 33% mentioned "skills" or "competencies"
- 12% mentioned "verification" or "certification" of skills and competencies
- 18% mentioned "short," "quick" or "fast" training

Of Canadian adults, 36% said they were somewhat or very familiar with our definition of micro-credentials that was provided in the survey.

Those who earned $40,000 or more, were employed full time, or had completed a degree were more likely to be very or somewhat familiar with our definition of micro-credentials.

4.

The most-requested forms of support to help adults enroll in and complete micro-credentials are (1) **financial support and** (2) **help comparing different credentials.**

Of Canadian adults, 54% told us an online platform where they could easily find and compare courses would be the most useful form of support.

Respondents told us they would be most interested in comparing across:

- cost of course or program offerings
- the credibility of the organization/company that issues the micro-credential
- time to earn the micro-credential
- option to choose between learning all online, all in person or a mix of both
- proof that employers hire or prioritize candidates who have this micro-credential

Of Canadian adults, 59% told us that financial support would be the most useful form of support to help them enroll.

Key finding 1: Continuous upskilling is not the norm—yet

The majority of surveyed working-age adults expressed interest in taking some form of formal or structured training to build professional or job-specific skills, but actual uptake was considerably lower.

This formal/structured learning is defined as including a course from a college or university, company, or online learning platform; a professional development offering by an association or union; a professional certification; compliance training as part of their job; an apprenticeship to learn a trade; or a boot camp.

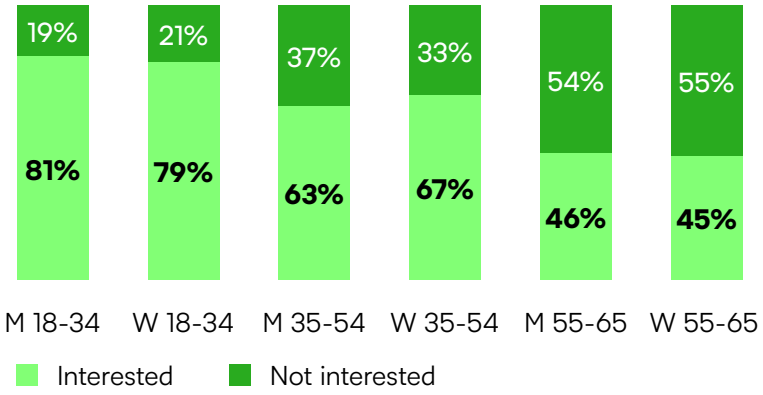
We also wanted to understand the extent to which adults were working toward or had completed professional credentials over the past year. Of Canadian adults, 39% had taken some kind of structured or formal education or training over the past 12 months. Only 35% of Canadian adults told us they were working toward or had received a degree, certificate, professional certification or license, or micro-credential in the past year. Looking more closely at the data, we found that higher-income earners, those employed full time and those with a prior credential were most likely to be participating in training, highlighting persistent gaps for those who do not fit in those categories.

In 2016, the World Economic Forum's first Future of Jobs Report predicted that 35% of workers' skills would be disrupted in the following five years. In its 2023 report, that share has risen to 44%.[ix] Investments in upskilling and reskilling are urgently needed to support people in adapting as technological changes, industrial evolutions and demographic shifts continue to rapidly change the ways in which we work. Still, the landscape of employer support for upskilling varies considerably by organization size, sector and region. For example, firms in professional, scientific and technical services (50%); utilities (47%); and finance and insurance (45%) provided training at much higher rates than those in retail trade (20%); mining and oil and gas extraction (18%); and agriculture, forestry, fishing and hunting (13%).[x] As automation continues to reshape jobs, there is a need for increased employer-supported upskilling to build organizational and employee resilience. A recent Statistics Canada study found that only a small proportion of laid-off workers participate in further education or training. However, those who do enroll in and complete short-term credentialled training (college or Còllege d'Enseignement Gènèral et Professionnel certificates or diplomas) experience substantial earnings gains compared to those who do not.[xi]

Increasing participation of adults in upskilling needs to be a shared priority of governments, education and training providers, and employers, creating the enabling systems to support individuals in need. As several of our interviewees told us, this is not just about creating opportunities for students who already have credentials but also for those who do not.

As we heard from Dr. Gervan Fearon, the President of George Brown College (Ontario, Canada), "There's a large portion of the population [42.5% of those aged 25 to 64 in Canada][xii] that doesn't have any postsecondary education, and we need to figure out how we can support, recruit, engage and incentivize these populations because getting the totality of your workforce trained and skilled up will ultimately impact productivity gains, competitiveness and prosperity." To reach all students, institutions need to think differently about not only how to market program offerings—and the career pathways they open up—but also the wraparound supports that are available for students to help learners succeed.

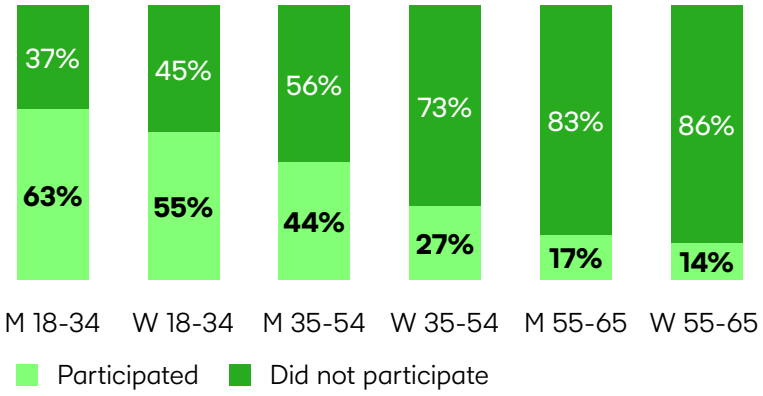
INTEREST IN PROFESSIONAL DEVELOPMENT BY AGE GROUP AND GENDER



©Research from D2L and Innovative Research Group, December 2022.

Canadian working-age adults are generally interested in taking on professional development (PD) to build additional industry- or job-specific skills.[1] Those who were most interested in taking this formal or structured professional development instead of self-directed study, for example, were under age 54. Around 80% of those under age 34 were interested in professional development to continue building their skills.

PARTICIPATION IN PD OVER PAST 12 MONTHS BY AGE GROUP AND GENDER



©Research from D2L and Innovative Research Group, December 2022.

Participation in professional development was most significant between the traditional postsecondary-school years of 18 to 34 and waned noticeably with increased age. In general, women were less likely to have taken any structured or formal education or training over the past 12 months.[2]

Higher education institutions are facing increased demands and costs, not only to provide wraparound and academic success supports for many students but also to meet regulations and all other expectations. Publicly funded institutions in particular face severe funding challenges. Stagnant operating grants and mandated freezes and cuts to domestic tuition are creating difficult fiscal realities for institutions. To be nimble, agile and responsive to industry skills needs, institutions need stable and reliable funds to make upfront investments in curriculum—and for public institutions, this must be a combination of government funding and new diversified streams of revenue to support relevant and excellent academic programs and services. Leveraging modern learning technology, institutions can mitigate the growth in administrative costs that tend to come with added programs and services.

1. Multiple select question, and includes individuals interested in taking courses at a college or university, online courses or certificates from a company, courses on an online learning platform, training from a professional association or union, or training from their current employer.
2. Multiple select question, and includes a course from a college or university, company, or online learning platform; a professional development offering at an association or union; a professional certification; an apprenticeship to learn a trade; or a boot camp.

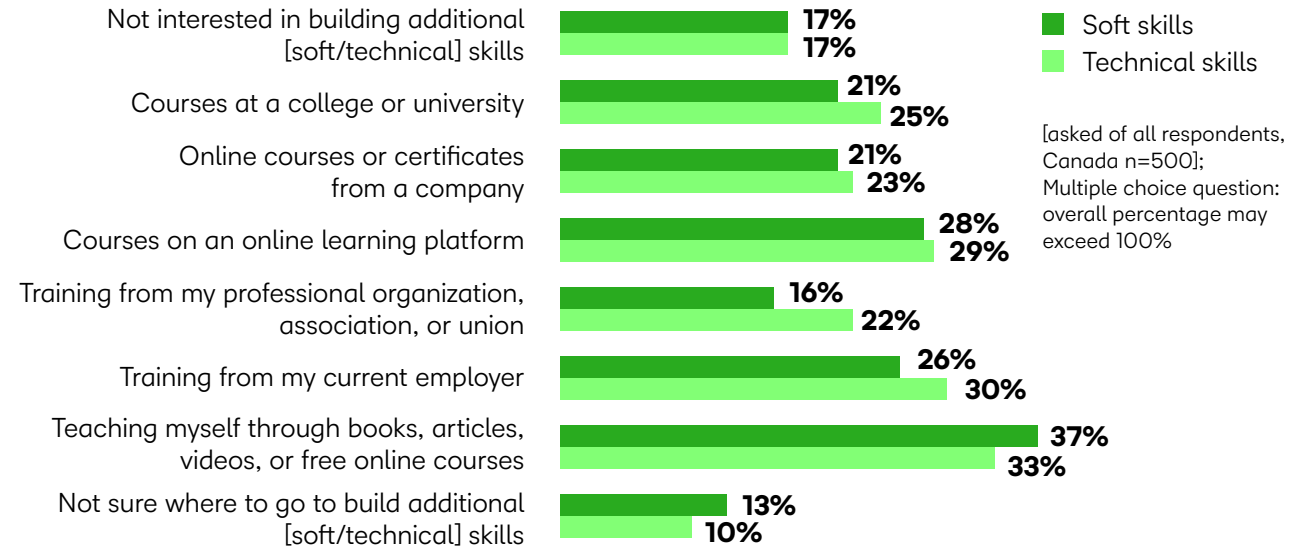
Key finding 2: There is no clear preference for training providers

U.S.-based nonprofit Credential Engine has been working to quantify the proliferation of different upskilling offerings available to learners. Its most recent report has identified more than 1 million unique credentials in the U.S.,[xiii] including:

- **postsecondary educational institutions:** 350,412 degrees and certificates
- **non-U.S. universities:** 13,014 course completion certificates, micro-credentials and online degrees
- **nonacademic providers:** 656,505 badges, course completion certificates, licenses, certifications and apprenticeships

OVER THE NEXT 12 MONTHS, IF YOU NEEDED TO BUILD ADDITIONAL SKILLS, WHERE WOULD YOU GO TO LEARN THESE? PLEASE SELECT ALL THAT APPLY.

[soft skills like leadership, critical thinking, and communication skills/professional or technical skills that are job or industry-specific]



Of Canadian adults, 10% are not sure where to go if they need to build additional professional or technical skills that are job- or industry-specific.

Of those who would consider structured or formal training offerings, a higher percentage—30%—would seek out training from their current employer to build these skills, and 22% would look for training from a professional organization, association or union. Comparatively, 25% of Canadian adults would consider taking a course at a college or university to build those skills.

There are conversations going on for the first time locally, regionally, nationally about looking at our funding and financial models and changing them because they don't incorporate any component of noncredit or continuing education.

- Dr. Shawnda Floyd, Provost of Dallas College (Texas, USA)

With so many options, the scale of competition faced by colleges and universities is increasingly large.

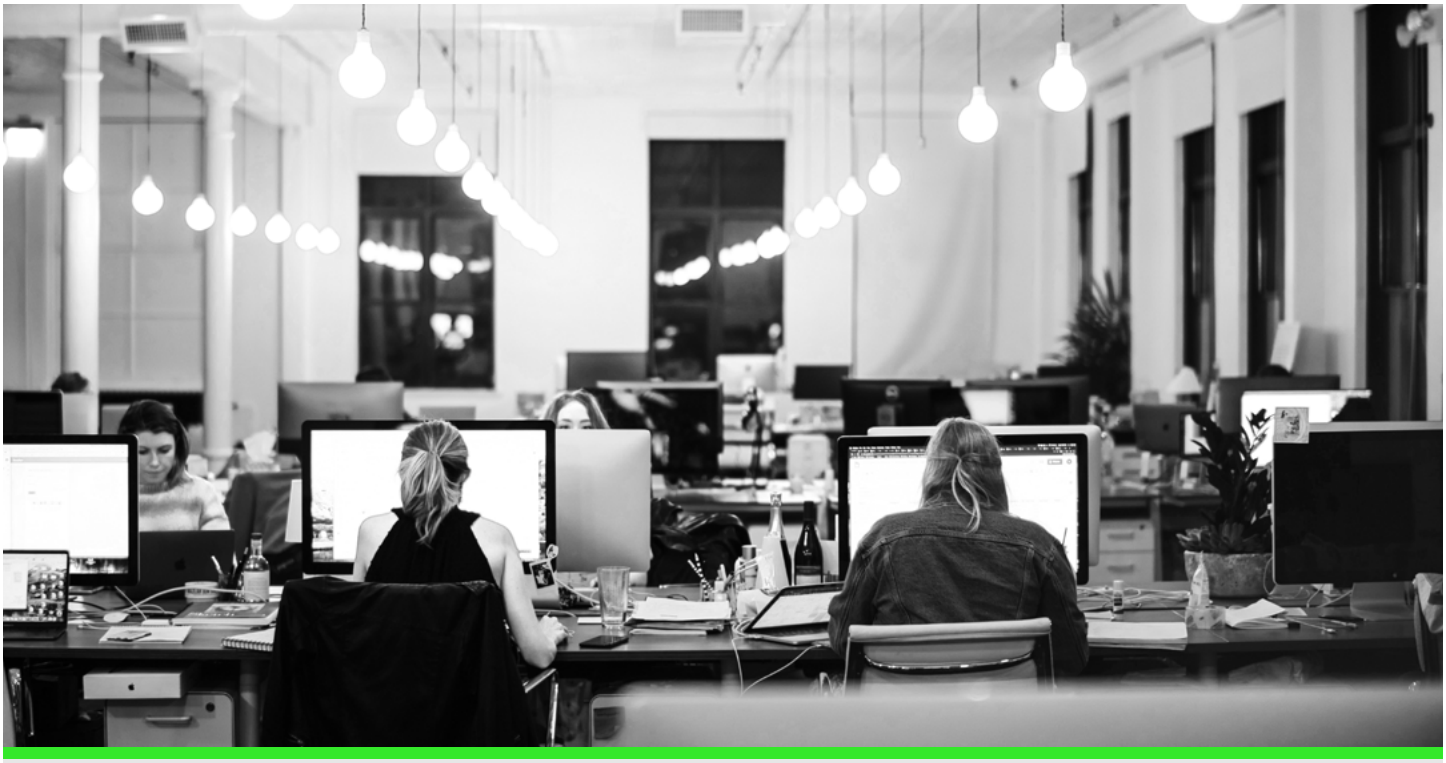
We spoke to Dr. Sean Gallagher, founder and Executive Director of the Center for the Future of Higher Education and Talent Strategy at Northeastern University (Massachusetts, USA) to understand the challenges higher education institutions face and to what extent the proliferation of nondegree credentials from other training providers posed an existential threat. He told us, "When you talk about enrollment declines, some of it is demographic, but probably the greatest challenge is maintaining relevance and keeping confidence that higher education has a return on investment and is a valuable pursuit that will deliver the outcomes that people will get when they pay for it. Institutions that have prestige and brand and resources and endowments at the top of the food chain are giant, well resourced, highly regarded, with strong brand recognition. But there are thousands of smaller universities—and although lifelong learning is a real and important dynamic, many higher education institutions are not well positioned to meet it in terms of serving professionals and workers in their primary focus and identity… There are so many solutions to meet that need, depending on who you are, and it could come just as easily come from a professional association or private education training provider." For higher education institutions that have focused heavily on degree-based education and the traditional college-age student, this is a new way of thinking.

Several interviewees told us there is a fallacy that micro-credentials and widespread continuing education are nothing new, but the scope, scale and modality of education in reality are very different. Dr. Shawnda Floyd, Provost of Dallas College (Texas, USA) told us, "I think we *think* we've been doing micro-credentials. When I talk about micro-credentials, it's accelerated skills training. We've always offered a couple courses here and there, but there's never really been a strategic intentional effort to say this is important and we will focus resources, energy and time behind this population of students and work with our partners to meet the workforce needs of our region. We've never really done that—and that's what we're trying to do and do that well. There are conversations going on for the first time locally, regionally, nationally about looking at our funding and financial models and changing them because they don't incorporate any component of noncredit or continuing education. It's been all about credit students… We are getting out of our own way about being transactional, about being high-minded about four-year degrees being the only way to succeed. We need to continue and produce and support lifelong learning like we've already said we've done."

If students are looking for ways to combine learning and earning, how do their educational needs transform? This is not about completely doing away with degrees but thinking about other forms of education scaffolding that can exist to provide pathways to jobs that will help students transform their lives. Deputy Vice Chancellor Academic of Deakin University (Victoria, Australia) Professor Elizabeth Johnson asked an important, provocative question:

"The question is really what is the role of universities in short-form learning? They're never going to own it; I think we all need to accept that. They are never going to own it, and they probably shouldn't; it's supposed to be responsive and to be a connector… Our approach is if we're doing short courses, it's because we have strengths to share. It has to be of value to the student, to the industry partner, and has to build on a university strength."

Every institution needs to ask the questions of what their strategic differentiators are and how they want to position themselves. The answer will differ for every higher education institution—deeply shaped by their history and mission, the makeup of their student population, and the expertise of their faculties. The competitive edge likely lies where institutions can find a balance between the curriculum and research strengths they already have, develop and leverage partnerships with employers, and focus on delivering quality teaching to build skills for the job market. For some institutions, that also looks like complementing skills *teaching* with skills *assessments*. Two people we interviewed raised this as an idea they see holding a promise for their institutions:



"Perhaps we're not the ones who develop the curriculum; we can leave it to the company that knows their software. We can partner by approving outcomes, having students submitting work, and we would be the trusted third party evaluating evidence of their achievements and confirming that they reached the learning outcomes.

So it's actually a play on micro-credentials, with a focus on evaluation of evidence of student achievement. There's a way for us to be able to articulate what these different competencies look like and what the evidence looks like, and then we can get into the work of evaluating them. That could also be evaluation of work learners are doing in their job right now—they don't need to take another course; our work could be all around the evaluation of evidence of a developed skill."

Dr. Gavan Watson,
Vice-Provost of Teaching and Learning, Queen's University (Ontario, Canada)

"Let me give an example from the automotive sector. If you look at the typical car, it will have almost 20,000 parts. If you're driving a Nissan, not all the parts are made by Nissan—you have different parts suppliers. You've got the suppliers, manufacturers, dealerships, customers. The automotive sector has made things so well that different parts come together, the dealership sells it as a Nissan and the importance for the customer is [if] it will take me from A to B easily.

My vision is for education to be like that, because content is everywhere. If we can trust that the assessment is good, we should be able to fit those things together so that when a credential is given, it could be from the University of Calgary, but it would have certain parts from Bow Valley College (BVC). For the employer, there is confidence that this person will deliver on what they say they are going to do...

We have made a strategic decision for future program development that all our programs will be competency-based, all of them will be modular and that will help us attach a micro-credential to all skills that are needed. This will help a student come for two months and get a micro-credential. If down the line we welcome them back, we will not make them repeat what they have already learned.

What the BVC micro-credential gives you is the ability to say we have assessed you and you have demonstrated the competency, and here are the companies we work with, and they are ready to hire you. It's not about content, because content is everywhere. Also, the other critical part is the employers understanding that these individuals are coming with the skills they are looking for."

Dr. Misheck Mwaba,
President and CEO, Bow Valley College (Alberta, Canada)

Higher education institutions go through rigorous processes, spending millions of dollars to ensure the quality of their degree-based programming. Every executive leader we interviewed told us that there are many different models to differentiate themselves from private training providers when it comes to skills teaching. Skills assessments speak to a different challenge of ensuring learners and employers both understand the specific skills associated with any training or work-integrated learning experiences, acting as a seal of quality to ensure return on investment for both parties. The use of a shared language, such as a skills taxonomy, is a critical area of alignment between higher education institutions and employers. This shared language can be tagged to skills-focused content and assessment items to better measure and attribute skills attainment to learners.

Key finding 3: Micro-credentials may hold promise, but they're not yet widely understood by individuals

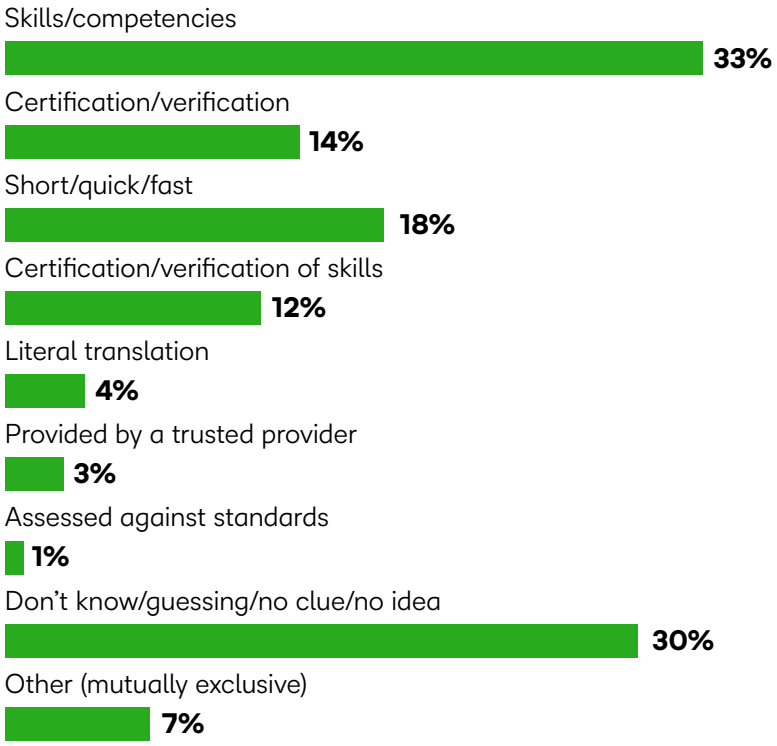
Micro-credentials have become an increasingly popular topic among higher education institutions, governments and thought leaders. As Dr. Sean Gallagher told us, five or six years ago, a wave of new credential constructs was created by higher education institutions at the margins of what was traditionally in this space—digital badges, certifications and micro-credentials. The big question initially was whether these would replace degrees. There are more regular and widespread conversations about the value—and necessity—of degree-based education today, particularly in the United States, with Opportunity@Work leading the campaign to "Tear the Paper Ceiling" and large employers ranging from Apple, IBM and Accenture to the governments of Pennsylvania, Utah and Denver all removing degree requirements for jobs. Gallagher, along with many of the other higher education leaders we interviewed, noted that there is still a place for degrees in the global economy, but they are not—and should not be—the only pathway for prospective learners. Career and technical education, apprenticeships, micro-credentials, and dual-enrollment programs are also examples of other forms of lifelong learning that should be embraced by higher education.

A key goal of this survey was to understand respondents' familiarity with and interest in enrolling in courses that offer micro-credentials. We know from research that there is rising demand for micro-credential offerings, and more people are enrolling as new offerings become available. However, we wanted to understand what working-age adults currently think of when they hear the term micro-credentials. When we asked an open-ended question to source definitions of micro-credentials, we found that three in 10 simply do not know what a micro-credential is. The top mention across definitions pertained to skills or competencies.

We later provided a definition of micro-credentials to assess familiarity, stating it is "a certification of specific skills or competencies. A micro-credential serves as a verification of what a learner knows, understands or can

UNDERSTANDING MICRO-CREDENTIALS

One type of credential people can earn is a micro-credential. Please describe in your own words what you think a micro-credential is:



Of Canadian adults, 30% simply didn't know how to describe what a micro-credential is in response to an open-ended question.

Of those who did provide descriptions:

- 33% mentioned "skills" or "competencies"
- 12% mentioned "verification" or "certification" of skills and competencies
- 18% mentioned "short," "quick" or "fast" training

do, and [it] is assessed against clearly defined standards by a trusted provider. A micro-credential is distinct from a degree, which would correspond to a broader set of skills and knowledge in a field or study." Of Canadian adults, 36% said they were somewhat or very familiar with our definition of micro-credentials.

Those who earned $40,000 or more, were employed full time or had completed a degree were more likely to be very or somewhat familiar with our definition of micro-credentials.

A majority of respondents—58% of Canadian adults—expressed some interest in enrolling in courses that offered micro-credentials. When we asked them why, the top reason for considering those courses was personal—"Because I like learning," followed by professional—"To get better at my existing job," followed by "To qualify for a raise or promotion." Only 20% of respondents indicated their top reason for working toward a micro-credential was to get a job.

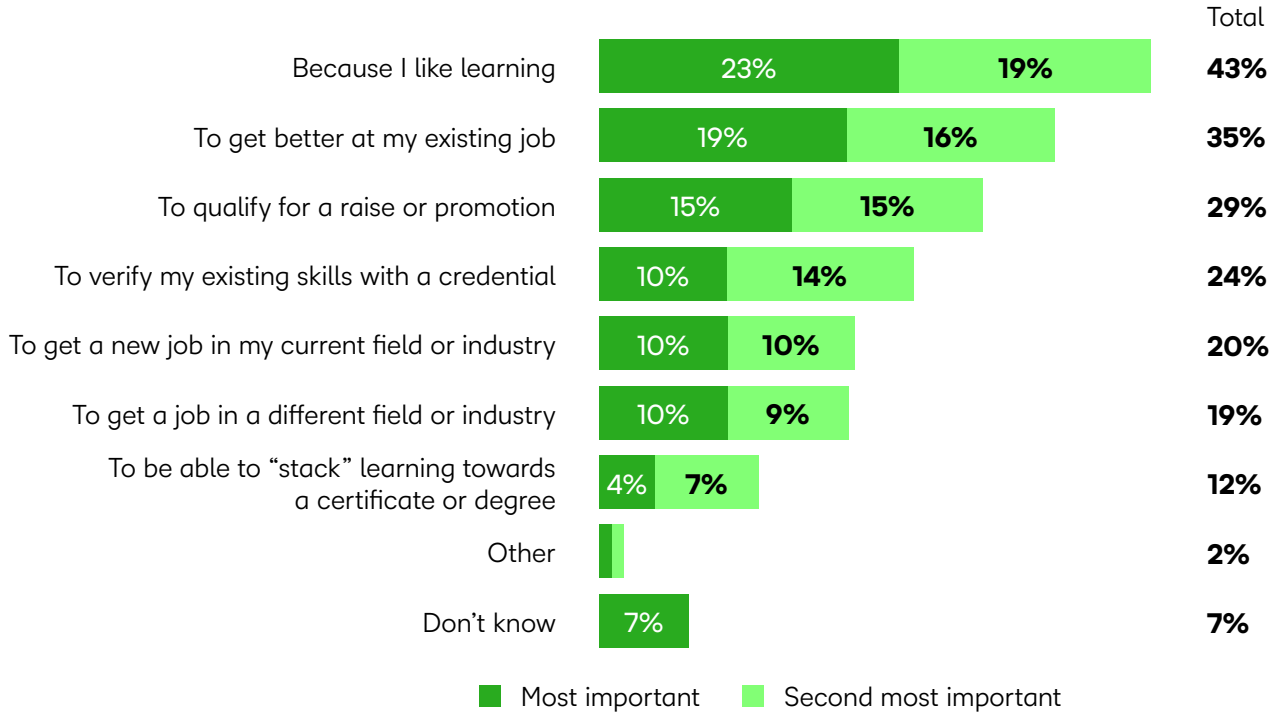
There is a lot of enthusiasm for micro-credentials around the world. As Professor Elizabeth Johnson at Deakin University told us about the Australian context, "If you talk to government, industry bodies, individual industry, students—everybody will tell you that short-form learning is a very important part of the ecosystem and a critical way of adapting to rapid change in the world of work. And it absolutely makes sense that it should be so—but the reality is that takeup is really patchy."

As we saw from the survey, there is very little agreement about what is meant when we refer to micro-credentials. Are they for credit or not for credit? What are the expected outcomes? Is learning assessed, and how? Are they about building general knowledge or focused on building specific skills? Without common language

WHAT IS THE MOST IMPORTANT REASON WHY YOU WOULD TAKE A COURSE/PROGRAM OFFERING A MICRO-CREDENTIAL IN THE NEXT 12 MONTHS?

WHAT IS THE SECOND MOST IMPORTANT REASON WHY YOU WOULD TAKE A COURSE/PROGRAM OFFERING A MICRO-CREDENTIAL IN THE NEXT 12 MONTHS?

[only asked of respondents who had at least shown some interest in enrolling in courses that offer micro-credentials, Canada n=412]



to ensure quality control, higher education institutions will be operating in silos trying to establish their own standards, which may not hold the same meaning for individuals looking to enroll or employers assessing them as proof of learning. However, while institutions recognize the importance of establishing common language about micro-credentials, there isn't agreement about how that happens. Similarly, the importance of a common skills language (or taxonomy) is recognized as important, but no agreement exists yet on the proper manner to describe and categorize skills.

> **I see an opportunity for the publicly assisted polytechnics and colleges to work together to create something for micro-credentials that differentiates the quality offerings from the mass.**
>
> - President David Agnew, Seneca Polytechnic (Ontario, Canada)

The President of Seneca Polytechnic (Ontario, Canada), David Agnew, offered one unique idea for institutions to lead this work on their own, using the example of the Vintners Quality Alliance (VQA) community of winemakers in Ontario: "I see an opportunity for the publicly assisted polytechnics and colleges to work together to create something for micro-credentials that differentiates the quality offerings from the mass, similar to a Good Housekeeping Seal of Approval or a VQA-type label for our credentials. One way of avoiding overregulation from government is for us to take on the responsibility of setting high standards and establishing a way of enforcing them so the consumer—or, in this case, the student—can be assured of getting a quality education." Importantly, this higher education approach could serve as a form of peer review for credentials, supplementing regulatory work needed from governments to align standards across local, regional, national, and international education and training providers. This second step is also crucial to bringing a structure to the conversation so individuals and employers alike have transparency of costs, outcomes, learning objectives and assessments. Micro-credentials need to be situated in a broader ecosystem of learning and training opportunities. Learning can serve more than one purpose, but education and training providers of all types need to be able to stand on the merits of the education they are providing and giving value to the learner.

Key finding 4: Financial assistance and help comparing different credentials are the most requested forms of support

Finally, we wanted to understand the major barriers preventing learners from enrolling in a course or program offering a micro-credential. Consistent with our findings in D2L's 2022 whitepaper on employer-supported skills development, the No. 1 reason working-age adults reported not being able to take a course was that they didn't have the money to pay for a course offering a micro-credential.[xiv] Too often in policy conversations, discussions about financial burden focus on the actual cost of enrolling in a program, forgetting the other supports learners may need to pursue education and training. Are they forgoing income by taking on additional education or training? How will they pay for the cost of course materials and technological tools that may be needed to access coursework? Is there an in-person component for which they need to find transportation and housing closer to campus? All these needs require wraparound supports to ensure learners succeed. In addition to these considerations, learners are also concerned about ensuring return on investment—making sure the offering they sign up for will serve their goals, whether they be to develop a specific skill set, secure a new job or promotion, or complete their education in a shorter time period.

Top reasons for not taking a course offering a micro-credential

What is the most important and the second-most-important reason you would not take a course offering a micro-credential in the next 12 months?

1. 

FINANCIAL COST OF A COURSE

Of Canadian respondents, 36% told us their biggest barrier to enrolling was not having the money to pay for a course.

2. 

TIME TO COMPLETE

The second-most-often cited barrier: 30% of Canadian respondents said they didn't have the time to take a course that offers a micro-credential.

3. 

SKILLS ALIGNMENT

Understanding what types of programs to take was the most important challenge for 24% of Canadian respondents, who said they were not sure what skills they need to develop.

4. 

NAVIGABILITY

Navigability was the most important barrier for 22% of Canadian respondents, who told us they were not sure where to find courses that offer micro-credentials.

5. 

CAREER PROGRESSION

Thinking about the next step after completing a micro-credential, 20% of Canadian respondents said the biggest barrier to enrolling was they were not sure how a micro-credential could help them advance.

6. 

VALUE OF CREDENTIAL

Not seeing the return on investment, 18% of Canadian respondents told us their biggest barrier to enrolling was that they didn't need a micro-credential to verify their skills.

7. 

WORK EXPERIENCE

Seeing a trade-off between class time and career time, 13% of Canadian respondents told us the biggest reason they would not enroll was they needed work experience more than they needed a micro-credential.

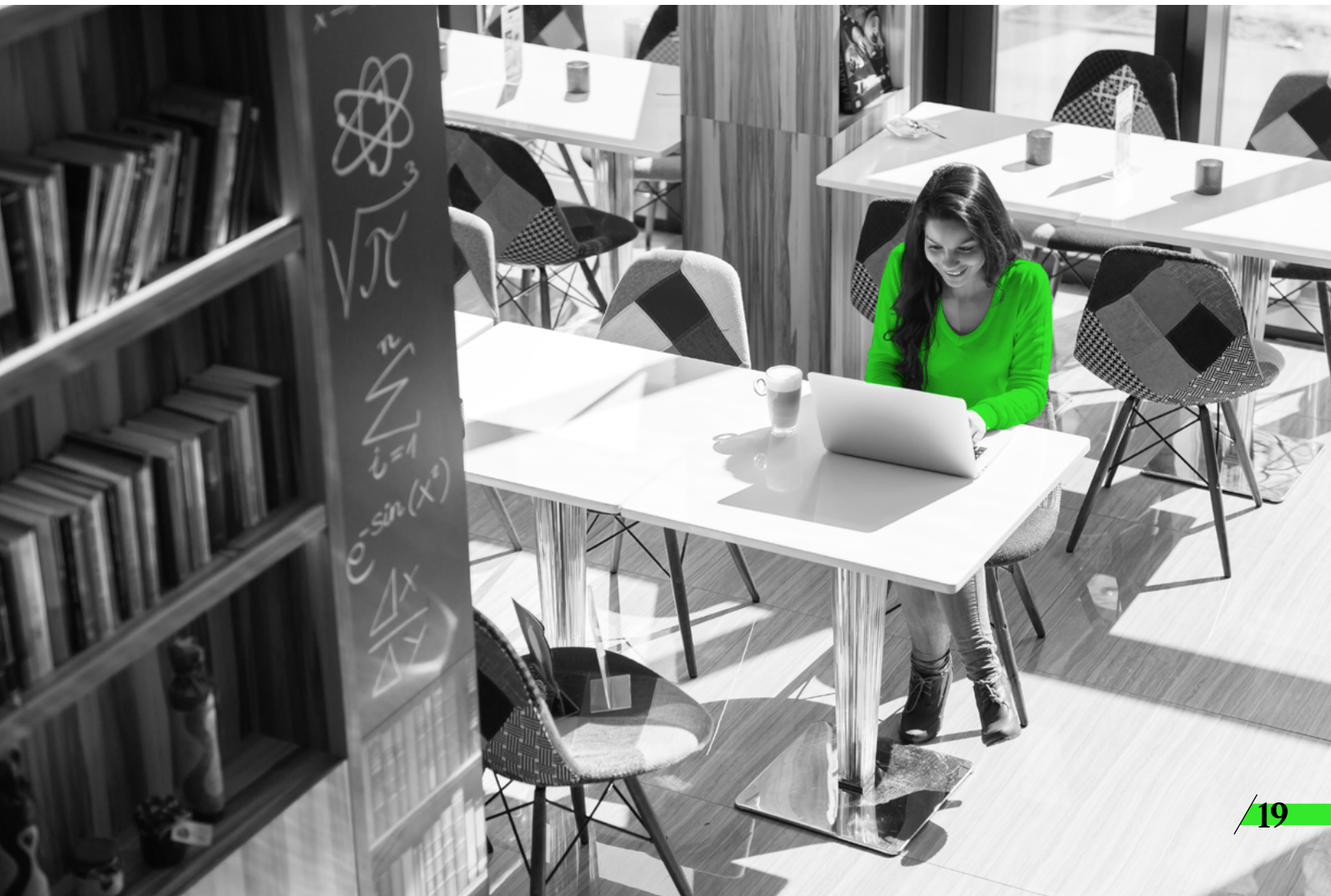
We also wanted to understand the forms of support that respondents thought would most help them enroll in and complete a course or program offering a micro-credential. The No. 1 thing—requested by 59% of Canadian adults—was financial support. The second-most-requested form of support was an online platform where they could easily find and compare courses—requested by 54% of adults.

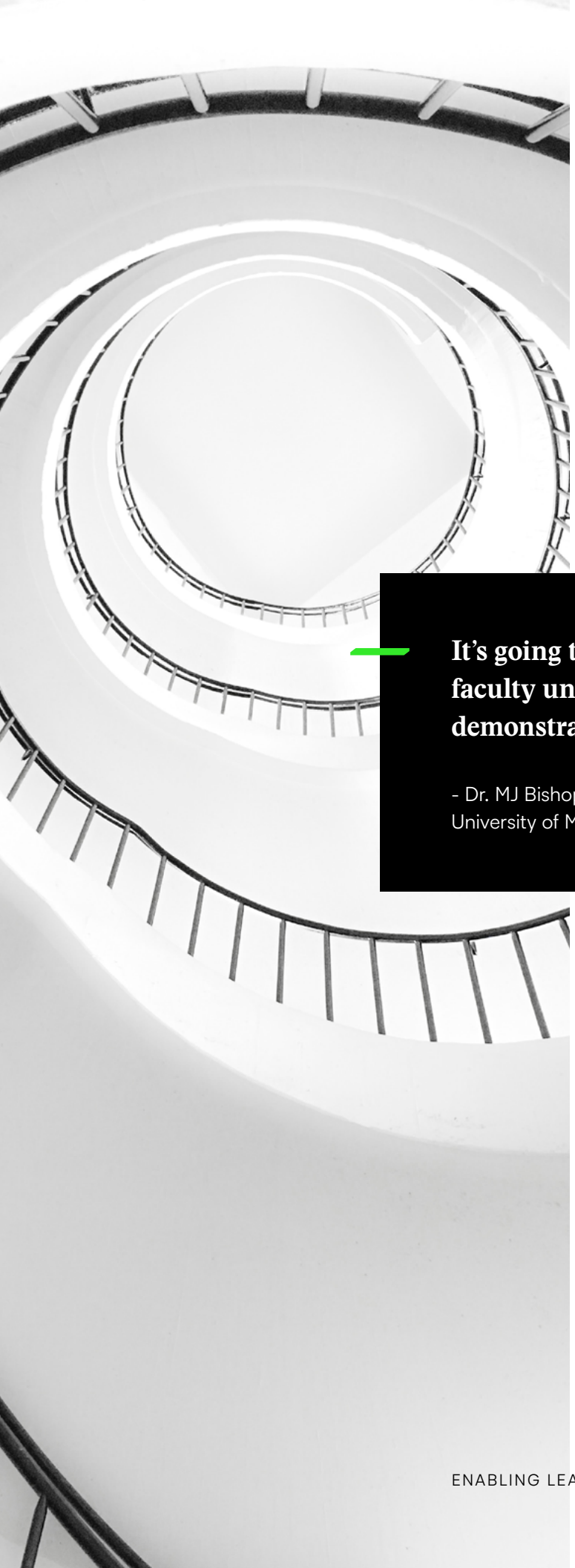
Respondents told us they would be most interested in comparing across:

- cost of course or program offerings
- the credibility of the organization/company that issues the micro-credential
- time to earn the micro-credential
- option to choose between learning all online, all in person or a mix of both
- proof that employers hire or prioritize candidates who have this micro-credential

More than two in five of Canadian respondents (41%) preferred courses that are entirely online, and 21% of Canadian respondents preferred hybrid formats where the learning was partially online and partially in person. Comparatively, Canadian adults ranked relevancy of content and assignments to their job, the ability to "stack" this course toward earning a certificate or degree, and the experience and expertise of instructors as much less important to their decision-making criteria when comparing courses or programs. Of Canadian respondents, 34% indicated they didn't have a preference regarding what type of organization or company issued a micro-credential. Among those with a preference, 30% preferred a college or university, compared with 16% who preferred those issued by an online training provider (e.g., Coursera, LinkedIn Learning, edX, Skillshare), and just 10% who preferred a company (e.g., Google, IBM, Amazon).

The executive leaders we interviewed across higher education institutions understood how challenging it was for learners and employers alike to navigate





the credential landscape. In her book *Long Life Learning*, Dr. Michelle R. Weise notes that although three-quarters or more of U.S. college presidents believe their institutions should publish information on institution-level loan debt, job placement rates and graduate school placement rates, few if any U.S. institutions currently willingly offer such information.[xv] When they do, it is not always in a standardized format to enable families and learners to compare the same things. For micro-credential offerings, which have only recently been introduced in many cases, colleges and universities are still in the stage of experimentation to see what works with curriculum design, assessments, modes of delivery and much more. Dr. MJ Bishop, Vice President for Integrative Learning Design at the University of Maryland Global Campus (Maryland, USA), knows that

> **It's going to be hard for us to sell this to faculty until we can create a more immediate, demonstrable benefit.**
>
> - Dr. MJ Bishop, Vice President for Integrative Learning Design at the University of Maryland Global Campus (Maryland, USA)

finding a way to improve navigability and improve the skills focus will be a transformational change. She told us, "It's going to be hard for us to sell this to faculty until we can create a more immediate, demonstrable benefit for going through the hard work and drudgery of identifying the skills in our programs. Explaining the advantages of this approach seems to always involve a 15-minute elevator pitch about curricular infrastructure, about creating the curricular map and the building blocks that allow us to piece things together toward transferring credits and giving credit for prior learning more effectively and efficiently. The benefits of doing this work aren't nearly as immediate or flashy as other digital learning projects we ask faculty to engage in. Getting this done will require a good communications plan to help get everyone on board and bought into the notion that this is an important way to move forward."

Being skills-first in curriculum design and program development requires internal faculty and administrator skills development and motivation alongside the technological infrastructure to make skills mapping possible. It also requires a strategic shift inside colleges and universities in some cases—to bring continuing education departments into the center of the institution and ensure that those executive leaders are getting the resources, attention and external promotion they need to build programs that can be introduced, iterated upon, scaled and expanded. Dr. Shawnda Floyd, Provost of Dallas College, told us that until a few years ago, the continuing education department was metaphorically located "in the basement, with broken lights swinging back and forth." In her words, "Is that a place that inspires confidence for students and employers, that creates a sense of belonging, the sense that I should be here, that I'm worthy of this bastion of knowledge? We decided to kick all of that down. A student is a student is a student. A class is a class is a class." Today, Dallas College has graduation ceremonies as one college, including anyone who finished his or her certificate program or associate program, to celebrate these students completing their programs. It's a strategic shift representative of the school's mission to serve all its students and value all learning.

On financial affordability, every institutional leader we spoke to told us that traditional provincial/territorial, federal and grant funding models that are degree-focused need to be changed to better support lifelong learning. For the institution, there is a high upfront cost to developing a quality short-form learning program—especially when it is designed to be delivered in a hybrid or a fully online format.

However, this is a major transition to the business model, and institutions are looking for funding to support such a major business model transition—whether it comes from governments with multiyear sustained funding or from employers agreeing to copay for program development. The need for noncredit students to able to access financial aid was another issue we heard across interviews and geographies.

The Ontario government is quickly expanding access to this type of aid and could serve as an example to other jurisdictions. The government is ensuring loans and grants will be available through the Ontario Student Assistance Program, for nearly 1,800 eligible micro-credentials that learners can access through a central online portal, managed by eCampus Ontario.[xvi] Notably, micro-credentials in the portal can be sorted by time to complete, modality of delivery, areas of focus and industries. Expanding and enhancing tools such as this are essential to continue improving the navigability of lifelong learning offerings to better support learners in their continued skills development.

Areas for further research

The results of D2L's survey on micro-credentials and interviews with executive leaders are shared with the intent of continuing a dialogue about the current state of lifelong learning and where there are gaps that education and training providers, governments and employers need to work collaboratively to address. There is ample opportunity for other organizations to build upon these insights and expand the sample size of both the quantitative and qualitative research data to gain deeper insights into many of the issues discussed, including the value of higher education offerings compared to those offered by private training providers, the key motivators for pursuing learning, and the major barriers that are preventing people from enrolling and completing credentials. Importantly, the experiences of individuals will vary depending on prior educational attainment, income level, geography, race, gender and occupation. Future studies with expanded sample sizes could offer additional insights with disaggregated data to add nuance to this conversation and ensure recommendations reflect the populations most in need of targeted wraparound supports.

Actions to address challenges and capitalize on opportunities

Higher education institutions, nontraditional education and training providers, employers and governments all have roles to play in facilitating ongoing skills development and lifelong learning for individuals. Creating a system that is accessible, affordable and equitable for all will require concerted and coordinated action across all sectors. The ultimate goal is to ensure employers have the talent they need to continue growing, individuals have pathways to develop their skills both on the job and outside work, and financial support is available to defray the costs of training.

To really rewire learning for life, employers need to recognize the business opportunity and necessity of investments in skills development to maintain competitiveness in employee recruitment, retention and company growth. Governments play a major role in creating the enabling infrastructure for skills development and need to move more quickly in adapting to the changes that lie ahead, with significantly increased investments in both employer-supported and individual-driven skills exploration.

Recommendations

Higher education institutions must invest in continuing education

Higher education institutions are the backbone of the workforce development system and have the resources and capacity to play a significant role in creating opportunities for individuals to exit and return to learning for upskilling throughout their lives. Across interviews, we heard from higher education leaders about the challenges in engaging and retaining adult learners, many of whom are working full time. The reality is this: The new working learners are a distinct consumer of education who seek pathways that are agile and adaptable to changing labor market needs. They are seeking more direct connections to good work, access to a network of employers and transparency about the return on investment of the credentials they choose to pursue. Higher education institutions cannot ignore the needs of the lifelong learners and need to adapt to serve learners not just at the front end of their lives but throughout their lifetimes. As one of our interviewees aptly shared, “In higher ed, what helped us thrive yesterday will not support us going forward.” Higher education institutions should offer the following support.

1. ELEVATE THE STRATEGIC IMPORTANCE OF CONTINUING EDUCATION, AND CENTRALIZE ITS ROLE WITHIN THE INSTITUTION:

- Invest resources to build professional, continuing, workforce and online education units to diversify the enrollment strategy and reach adult learners. By aligning these units more closely with the broader institutional portfolio, institutions can enhance their ability to cater to diverse learners and provide comprehensive, lifelong learning options.
- Promote cooperation between deans of aligned faculties and the school to develop programs together. This collaboration ensures that faculty maintain their role in ensuring academic integrity and quality, while benefiting from the support services provided by professional and continuing education schools, such as marketing, registration assistance, customer support and online program management advice.[xvii]

2. INVEST IN PARTNERSHIPS WITH EMPLOYERS:

- Cultivate enduring partnerships with employers to gain insight into their future-oriented skills requirements. Collaborate to co-create programming that is relevant, accessible, affordable and timely, facilitating a continuous influx of skilled individuals into targeted career paths. It is crucial to maintain an iterative approach, consistently updating offerings to align with evolving needs and industry changes, while understanding the practical limitations of making every program highly customized to a specific employer or industry.
- Invest resources and time to more explicitly match and tag programs to needed skills and competencies. As credentials shift to digital forms, having metadata about skills will support individuals and employees in assessing the potential return on investment for their education against the job requirements they may be comparing against and ensure portability of learning to various contexts.

3. THINK CREATIVELY TO DEVELOP NEW MODELS THAT SERVE ADULT LEARNERS:

- Think beyond credit hours, degrees and seat time as the only valid measures of learning, and develop new program models to support adult learners. Help learners see what value their micro-credentials and other short-form learning offerings hold and how they rank against other offerings by situating them within a continuum of credentials that includes both credit and noncredit offerings.
- Incorporate competency- and skills-based taxonomies in courses, programs and individual learning objects to enable learners to identify the micro-credentials or programs of importance to their career growth or to build their own skills-based learning programs.
- Develop innovative approaches for meeting and engaging the learner beyond direct-to-consumer models, including an “education as a service” model, where institutions offer their learning courses and programs as part of an employer’s education benefit program for employees.
- Enable a system that supports the recognition of prior learning and portability outside the institution where it was achieved, leaning into a new role for higher education institutions as assessors of quality that are distinct from other education and training providers.
- Expand alternative approaches to program design that could make it easier for students to learn and earn simultaneously. One example is thinking through options to allow students to complete the bulk of their learning online and asynchronously, with a few weeks of dedicated, on-campus, intensive work.

Employers must invest in skills development for their workforce

Employers of all sizes and across all industries are struggling to attract and retain the talent they need to remain innovative and competitive in today's economy. In a competitive talent landscape with rapidly changing skill requirements, organizations that prioritize lifelong learning benefit from employees equipped with the skills and knowledge to succeed throughout their careers and beyond their current roles. Investing in skills development for new and existing employees is a key benefit to improve attraction and retention.

1. INVEST IN ONGOING EMPLOYEE SKILLS DEVELOPMENT:

- Treat employee skills development as an investment in the organization's resilience, and offer employees an education-as-a-benefit program to create a learning culture. Offering financial support for employees to pursue credentialed and industry-aligned programs at higher education institutions, for example, can help grow their skill sets, improve productivity and drive retention.
- Supplement education provided through higher education institutions and other training providers with quality internal learning programs that include onboarding, temporary assignments and project-based learning. Employees should feel empowered to take charge of their own careers with career coaching, cross-team assignments and job-shadowing opportunities—and a formal infrastructure of learning options can give employees the information they need to take this advantage of these initiatives.

- Leverage promising models such as apprenticeships to support skills building, increase collaboration and retain talent. Using four techniques—modeling, scaffolding, coaching and fading—employers can take inspiration from apprenticeships that have traditionally been focused on the skilled trades to develop a reliable supply of talent to high-volume roles, teach industry- and employer-specific skills or fill a gap for jobs that are new to the labor market.[xii]

2. INVEST IN PARTNERSHIPS WITH HIGHER EDUCATION INSTITUTIONS:

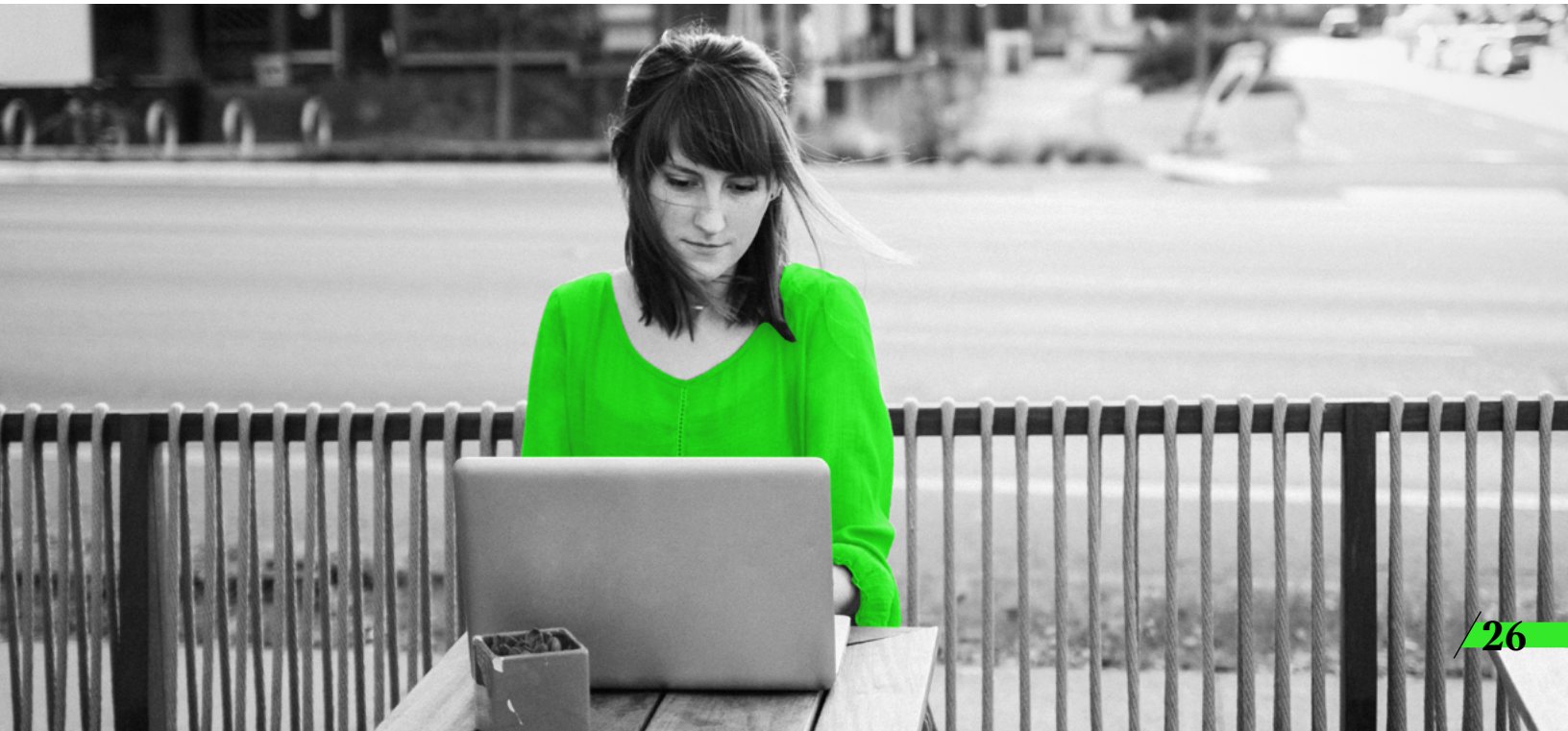
- Build long-term relationships with higher education institutions to help them understand current and anticipated labor shortages, and co-design relevant, timely and accessible programming that can directly translate into hiring and professional advancement.
- Work with higher education institutions to iteratively define the skills needed for specific career pathways, and commit to hiring learners who successfully complete micro-credentials or receive assessments verifying these skills.
- Recognize that higher education institutions are increasingly eager to work in partnership with employers and are highly motivated to create customized learning experiences where research interests align.

3. POOL RESOURCES WITH OTHER ORGANIZATIONS THAT MAY FACE THE SAME TECHNICAL SKILLS DEVELOPMENT NEEDS:

- When many employers across an industry or a sector require skilled talent in an emerging area, they can form partnerships with governments, training providers, associations, unions and educational institutions to create specialized programs for skills development.
- In certain cases, this could also include making copays upfront so that industry organizations, governments and higher education institutions can develop short-form learning programs that will create pipelines of talent to meet local and regional needs.

4. SUPPORT EMPLOYEES IN NAVIGATING SKILLS DEVELOPMENT OPTIONS:

- Implement technologies that provide ready access to learning that maps against skills needs at a company or in an industry, providing employees with confidence that the training they receive externally will be valued and can translate into career growth and compensation advancement.



Governments must introduce supportive policy to encourage innovation

Governments have an integral role to play in incentivizing and providing providers of ongoing skills development—employers, higher education institutions, associations, unions and more—to remain nimble as skills needs shift, so they are well positioned to continue supporting individuals throughout their careers. They also have an important role to play in communicating the value and imperative of continuous skills development for the broader population and creating the enabling infrastructure that will allow people to navigate the array of options presented to them, identify targeted training, and easily locate and secure financial and wraparound supports. To that end, governments should have the following policies.

1. PROVIDE FINANCIAL SUPPORT FOR INDIVIDUALS TO MEET THEIR ONGOING AND FUTURE TRAINING NEEDS:

- Create new models of portable, personal learning credits or training accounts to support individuals in defining and pursuing their own learning paths, regardless of their employment status (e.g., employed, gig worker or unemployed).
- Extend student financial assistance to support learners in enrolling in programs offering micro-credentials—not just degree-based or for-credit programs. Student financial assistance should be expanded beyond tuition fees to also cover materials that could support learning (e.g., textbooks, laptops), child care services, transportation and meal subsidies to ensure learners are set up to succeed.
- Use progressive tax incentives to establish these education and training accounts, similar to those that already exist for retirement, education and health savings accounts to which employers, workers and other funders could contribute to pay for eligible training expenses.[xix] Tax incentives could be designed to focus on individuals in low-wage and entry-level positions, those most at risk for elimination due to changing economic needs and technology, and those in precarious work circumstances.
- One model is for provincial/territorial governments to certify employer-backed partnerships with education, training and credentialing partners. This would allow employers to recover the cost of training by having a portion or all of an employee's state income tax deferred to the employer or a training fund managed by an employer collaborative.[xx] This model can also help reduce the state or the provincial government's role in grant making, empowering those closest to the challenges to identify the best solutions.

2. EXPLORE NEW WAYS TO INCENTIVIZE EMPLOYERS TO PROVIDE MORE SUPPORT FOR EXTERNAL TRAINING:

- Consider offering a taxable incentive to employers instead of a grant to set up government support for longer-term success, reduce administrative grant efforts on the part of the government and employers, and ensure employers are recouping part—or all—of the cost of their investments in training,
- Several states, including Connecticut, Georgia, Kentucky, Mississippi, Ohio, Rhode Island and Virginia, provide tax incentives to encourage training investments, with incentives ranging from 5% to 50% of eligible training expenses:[xxi]
- Ohio's TechCred program, a state-run funding program designed to promote workforce development and training, reimburses Ohio businesses up to $2,000 per credential when current or prospective employees complete industry-recognized, technology-focused and less than one-year-long credentials.[xxii]

3. MEET THE MOMENT, AND ADAPT POLICIES, PROGRAMS, LIMITS AND REGULATIONS ACCORDINGLY:

- Build trust among all providers on what micro-credentials do and don't mean—being clear on outcomes, assessments and quality control to differentiate the flood of offerings currently available in the market.
- Reassess public funding mechanisms to acknowledge the increased need for quality, short-form learning programs, and provide predictable and longer-term funding that will empower higher education institutions to innovate instead of being hindered in doing so. While pilot programs for micro-credentials and pandemic time upskilling funding have been helpful, sustained funding is needed to help institutions make substantial upfront investments to develop micro-credential offerings that will be used for years to come.
- Increase government grants to support higher education institutions in making capital investments, including in core and technological infrastructure.

4. INTEGRATE WORKFORCE AND ECONOMIC DEVELOPMENT MORE MEANINGFULLY:

- Enable closer collaboration between industry and higher education by facilitating conversations regarding workforce and economic development policies in tandem. For example, address where there are jobs that need filling, what skills are needed and who the trusted providers that can support learners in getting to these goals are.
- Embrace agility and nimbleness for developing and granting quality assurance for short-form credentials in one- to-three-month time frames instead of the two years or more that may be required for traditional degree-based credentials.
- Continue exploring ways to encourage participation in micro-credential programs by groups that are traditionally underrepresented in formal education programs, including by those who do not already have degrees.
- Adapt government policies in times of full or near employment so that programs truly support upskilling within industries to drive economic growth and are not solely focused on skills for jobs that do not exist yet.

Conclusion

With this year's whitepaper, we set out to dive deeper into how higher education is adapting to meet the needs of working learners. Despite the increasingly rapid pace of technological change and the emergence of new models of learning, we believe higher education institutions are still highly relevant players in preparing working learners for the jobs of tomorrow offering structured programs of study, access to networks and resources, and credibility and recognition among employers that still hold weight. Our research shows that higher education institutions already recognize that the "once and done" approach to skills development—with 20 years of formal education at the front end of one's life—is increasingly out of step with the needs of workers looking to remain competitive over the course of 60+ years of work. Looking to the future, they recognize that the "traditional" learner enrolling in higher education, conventionally 18 to 21 years old with a high school diploma, is no longer the main student. Institutions are adapting to this new reality by investing in continuing education offerings; introducing and scaling micro-credentials; thinking holistically about the student experience, including wraparound supports; and developing deeper and longer-term partnerships with employers.

References

Appendix: Glossary

APPRENTICESHIP	Apprenticeships combine paid on-the-job training with classroom instruction to prepare workers for high-skill careers. Apprenticeships combine paid on-the-job training with classroom instruction to prepare workers for high-skill careers.[xxiii]
BADGE OR DIGITAL BADGE	This is a credential that represents the validation of a skill or competency. Often a badge represents the completion of a micro-credential.[xxiv]
CAREER AND TECHNICAL EDUCATION	Career and technical education are courses at the high school level and programs at the postsecondary level that focus on the skills and knowledge required for specific jobs or fields of work.[xxv]
CERTIFICATE CERTIFICATE OF COMPLETION	A certificate or a certificate of completion is a recognition of the completion of a course or a program. A certificate of completion is not evidence of passing an exam or meeting industry standards.[xxvi]
CERTIFICATION	A certification is the recognition of passing an assessment of standards. Standards are often set by an industrywide process. Certifications typically result in the attribution of a designation to the earning individual, such as certified public accountant, project management professional, nurse practitioner or registered nurse.[xxvi]
DUAL ENROLLMENT PROGRAMS	These programs allows high school students to take a college course and earn both high school and college credits.[xxvii]
LICENSE	This is a credential conferred by a governmental agency, and it permits an individual to practice a regulated profession, such as teaching, cosmetology or medicine. Individuals are often required to pass an examination before being granted a license.[xxiii]
MICRO-CREDENTIALS	These are certifications that verify an individual's competence in a specific skill or set of skills.[xxix]
NONDEGREE CREDENTIAL	This is a general term for any credential of learning that does not result in an academic degree, such as an associate, bachelor's or master's. Certificate, license and micro-credential all are forms of nondegree credentials.[xxx]

i. Burning Glass Institute (2022). *The Emerging Degree Reset.* https://www.burningglassinstitute.org/research/the-emerging-degree-reset.

ii. The Stanford Center on Longevity (2022). *The New Map of Life.* https://longevity.stanford.edu/the-new-map-of-life-report/.

iii. OECD (2023). *Old-age dependency ratio.* https://data.oecd.org/pop/old-age-dependency-ratio.htm.

iv. Bloom, D.E. & Zucker, L.M. (2022, Nov. 1). Aging is the real population bomb. *International Monetary Fund.* https://www.imf.org/en/Publications/fandd/issues/Series/Analytical-Series/aging-is-the-real-population-bomb-bloom-zucker.

v. Gleckman, Howard. (2023, March 15). The Worldwide Debate Over Raising the Retirement Age. *Forbes.* https://www.forbes.com/sites/howardgleckman/2023/03/15/the-worldwide-debate-over-raising-the-retirement-age/?sh=597aa24d1402.

vi. Mok, A. & Zinkula, J. (2023, April 9). ChatGPT may be coming for our jobs. *Business Insider.* https://www.businessinsider.com/chatgpt-jobs-at-risk-replacement-artificial-intelligence-ai-labor-trends-2023-02.

vii. Lumina Foundation (2023). https://www.luminafoundation.org/campaign/todays-student/.

viii. Rogers, C., Smiri, L., Ma, S. & Bright, K. (2018). Higher education for a changing world. *Deloitte Australia.* https://www2.deloitte.com/au/en/pages/public-sector/articles/higher-education-changing-world.html.

ix. World Economic Forum. (2023). *The Future of Jobs Report 2023.* p.37. https://www.weforum.org/reports/the-future-of-jobs-report-2023/.

x. Munro, D. & Lamb, C. (2023). Employer-sponsored Skills Training. *Future Skills Centre*, p 32. https://fsc-ccf.ca/wp-content/uploads/2023/02/2023-02-Employer-Sponsored-Training_EN.pdf.

xi. Frenette, M. & Handler, T. (2022, Nov. 23). Does taking short postsecondary programs or independent credits benefit recently displaced workers? *Statistics Canada.* https://www150.statcan.gc.ca/n1/pub/36-28-0001/2022011/article/00003-eng.htm.

xii. Statistics Canada (2022, Nov. 30). Canada leads the G7 for the most educated workforce. https://www150.statcan.gc.ca/n1/daily-quotidien/221130/dq221130a-eng.htm.

xiii. Credential Engine. (2022). Counting U.S. Postsecondary and Secondary Credentials. *Credential Engine.* https://credentialengine.org/wp-content/uploads/2023/01/Final-CountingCredentials_2022.pdf.

xiv. Asthana, M. & Desetti, B. (2022). Enabling upskilling at scale. *D2L.* https://www.d2l.com/future-of-work/enabling-upskilling-at-scale/.

xv. Jaschik, S. & Lederman, L. (2014). The 2014 Inside Higher Ed Survey of College & University Presidents. *Gallup and Inside Higher Ed.* p. 6. https://www.insidehighered.com/news/survey/survey-presidents-reveals-growing-divide-confidence-opposition-free-college-and-broad *referenced in* Michelle R. Weise (2021). *Long life learning: Preparing for jobs that don't exist yet.* Wiley. p. 80

xvi. eCampus Ontario. (2023, March 24). eCampusOntario supports strategic skills funding in Budget 2023. *eCampus Ontario.* https://www.ecampusontario.ca/ecampusontario-supports-strategic-skills-funding-in-budget-2023/.

xvii. McNutt, J. Kim. (2018, Oct. 12). Incubating innovation: The growing role of continuing education on university campuses. *The EvoLLLution.* https://evolllution.com/revenue-streams/market_opportunities/incubating-innovation-the-growing-role-of-continuing-education-on-university-campuses/.

xviii. Bingham, S., Edwards, E., Mortimer, A., & Vankudre, R. (2022). The Changing Face of Apprenticeships: New Opportunities for Employers and STARS. *Lightcast and Opportunity@Work.* p. 10. https://lightcast.io/the-changing-face-of-apprenticeships-download?submissionGuid=ec5e7030-7656-44ea-b2f3-eb42a84ee37f.

xix. Tyszko, J., Sheets, R., Beard, P., Andreason, S., & Miller, S. (2020). Talent finance: A new consensus and return-to-investment. *U.S. Chamber of Commerce Foundation.* p. 39. https://www.uschamberfoundation.org/sites/default/files/CEW%20Talent%20Finance%20Report-web.pdf.

xx. *Ibid*, p. 40.

xxi. McKay, C., Pollack, E., & Fitzpayne, A. (2019, April). Automation and a changing economy. Part II: Policies for shared prosperity. *The Aspen Institute Future of Work Initiative.* https://fow.innovation.nj.gov/solutions/create-worker-training-tax-credit.

xxii. Government of Ohio (2023). Ohio TechCred. https://techcred.ohio.gov/about/program-guidelines.

xxiii. U.S. Department of Labor (2023). Apprenticeship. https://www.dol.gov/general/topic/training/apprenticeship#:~:text=Apprenticeships%20combine%20paid%20on%2Dthe,them%20for%20good%2Dpaying%20jobs.

xxiv. Braxton, S., Bohrer, J., Jacobson, T., Moore, K., Leuba, M., Proctor, C., & Reed, A. (2019). 7 things you should know about digital badges. EDUCAUSE. https://library.educause.edu/resources/2019/7/7-things-you-should-know-about-digital-badges.

xxv. U.S. Department of Education. (2023). Perkins state plans and data explorer. https://cte.ed.gov/dataexplorer/about#:~:text=CTE%20%E2%80%93%20Career%20and%20Technical%20Education,jobs%20or%20fields%20of%20work.

xxvi. University of Virginia. (n.d.). Certificate vs. certification. University of Virginia School of Continuing and Professional Studies. https://www.scps.virginia.edu/certificate-vs-certification.

xxvii. Rhine, L. (2022, Sept. 1). The power of dual enrollment: The equitable expansion of college access and success. U.S. Department of Education. https://blog.ed.gov/2022/09/the-power-of-dual-enrollment-the-equitable-expansion-of-college-access-and-success/.

xxviii. International Affairs Office. (n.d.) Professional licensure. U.S. Department of Education. https://sites.ed.gov/international/professional-licensure/.

xxix. Digital Promise. (n.d.) Micro-credentials. https://digitalpromise.org/initiative/educator-micro-credentials/.

xxx. National Center for Education Statistics. (n.d.). Working definitions of non-degree credentials. https://nces.ed.gov/surveys/gemena/definitions.asp.

D2L

ABOUT D2L

D2L is a global learning innovation company, reshaping the future of education and work. We're leading the way into a new era of personalized learning, driven by the belief that everyone deserves access to high-quality education, regardless of their age, ability or location. Our signature technology products—D2L Brightspace and D2L Wave—enhance the learning experience for millions of learners at every stage of life, from the earliest days of school to the working world.

Learn more at **D2L.com**

/D2Linc
@D2L
@D2L
linkedin.com/company/D2L
ContactUs@D2L.com

GLOBAL HEADQUARTERS

137 Glasgow Street, Suite 560
Kitchener, ON, Canada
N2G 4X8