Artículo Original

The Future is Small: Microcredentials and the Skills Agenda

El futuro es pequeño: las microcredenciales y la agenda de competencias

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Abstract

In response to a worsening global skills shortage which is already disrupting economies, governments and institutions have embraced microcredentials. Intended as short (hour and weeks rather than months and years), competency-based driven by the skills needed by employers, the market is now awash with short courses claiming to be microcredentials. The result is a market swamped with courses and market confusion. This paper outlines the opportunity, the challenges and the missteps in this fast-emerging market and suggests a probable future.

Keywords: Skills, Skills Gaps, Microcredentials, MOOCs, Long-form Learning, Microlearning.

Resumen

En respuesta a la creciente escasez de competencias a nivel mundial, que ya está perturbando las economías, los gobiernos y las instituciones han adoptado las microcredenciales. El mercado, que pretende ser corto (horas y semanas en lugar de meses y años) y basado en las competencias que necesitan los empleadores, está ahora inundado de cursos cortos que dicen ser microcredenciales. El resultado es un mercado inundado de cursos y una confusión en el mercado. Este documento describe las oportunidades, los retos y los errores de este mercado emergente y sugiere un futuro probable.

Palabras clave: Transformación, aprendizaje en línea, nueva gestión pública, desarrollo sostenible, aprendizaje con tecnología.

As governments around the world look to rebuild their pandemic damaged economies and avoid the combined perils of large-scale unemployment, debt and fiscal deficits, the growing impacts of climate change and the digital disruption of work, one thing is clear: skilled labour is in short supply and the demand for skills is growing world-wide. So serious is the skills shortage that global supply chains are now disrupted, perhaps permanently. There is a global war for talent (Kelly, 2021).

The situation is not helped by the demographics of many countries. Though some are experiencing significant growth in the number of young people entering the workforce (e.g., Nigeria, Sierra Leone, Iran, Pakistan, Israel, Philippines, Paraguay) others are challenged by a shrinking workforce. For example, Canada currently has the lowest birth rate in one hundred years and is seeing its dependency ratio – the number of those in work supporting those not in work – fall from 7:1 (1967) to 3:1 (2021) and anticipated to reach 2:1 by 2030 (Bricker and Ibbitson, 2021). In Japan the dependency ratio is already 1:1. Indeed, of the G7 economies all are experiencing declining birth rates, ageing populations and challenges in finding and keeping skilled labour.

The situation in Canada is that, despite an unemployment rate of between 7% and 9%, on average, 470,000 jobs went unfilled each quarter between Q1-2016 and Q1-2020, and during the last quarter of 2020 there were 560,000 vacant jobs (Statistics Canada, 2021a). 75% of Canadian firms indicate that they are challenged to find the skilled labour they need for existing job opportunities and are constrained in their growth plans by labour shortages (Deloitte, 2021). The situation is worse in the UK and the US.

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The Skills Gaps

The skills challenge is in fact complex. The most obvious skill gap is between the skills sought by employers and the skilled labour available. But there are other gaps:

The Expectations Gap

This is the gap between what employees expect in the workplace and what employers offer. This is a complex gap, most often related to the very different expectations for the nature of work held by millennials and those held by an older generation (Spence, 2012). But it can also be related the difference between how an individual was trained in a particular way of working and how that work is undertaken in the organization they now work for – different methods, technologies, business processes (Paff, 2016).

The Productivity Gap – The Skills We need to Develop to Significantly Improve Productivity

The skills needed to practice adaptive and agile management, lean manufacturing, efficient and effective service need improvement. Leadership. communication and strategic human resource management are all skills which need strengthening. Skills Canada reports that 40 percent of new jobs created in the next decade in North America will be in the skilled trades. However, currently only 26 percent of young people aged 13 to 24 are considering a career in these areas (Canadian Apprenticeship Forum, 2021). Once on the job, they also need investment in their skills to significantly improve Canada's productivity, which is significantly lower than in many other jurisdictions around the world[i]. The kind of skills needed here relate to lean production and service systems, Integrated project delivery and effective supply chain management - all of which require a high level of design thinking and effective teamwork.

The Leverage Gap – The Underutilization of Skills in the Workforce

Once employees are in the workplace, do we fully leverage the skills they have? This is fundamentally a problem about the way we design work, the way people and technology interact, and how human resource management functions in the workplace. But it also reflects our lack of focus on employees as people with needs for learning and development. We might also ask if we are underutilizing apprentices within the workplace – for training, productivity improvement and the development of their collaborative skills.

There has also been a significant growth of "bullshit" jobs in both the public and the private sector (Graeber, 2018), most especially in the private sector. Such jobs are non-essential, well-paid positions (e.g., security assistant, executive assistant, concierge) which do not create value or add to productivity. The late David Graeber (2018) defines these jobs this way:

> A bullshit job is a job which is so pointless, or even pernicious, that even the person doing the job secretly believes that it shouldn't exist. Of course, you have to pretend — that's the bullshit element, that you kind of have to pretend there's a reason for this job to be here. But secretly, you think if this job didn't exist, either it would make no difference whatsoever, or the world would actually be a slightly better place.

In a 2013 survey of 12,000 professionals by the Harvard Business Review, 50% said they felt their job had no "meaning and significance", and an equal number were unable to relate to their job in any direct way to the company's mission (Koloc, 2013) while another poll among 230,000 employees in 142 countries showed that only 13% of workers like their job (Crabtree, 2013). A YouGuv poll among British workers revealed that as many as 37% think they have a job that is utterly useless (Dahlgreen, 2015).

The Futures Gap – The Gap Between Current Skill Sets and the Skills We Need to Become Competitive in the 4th Industrial Revolution

The World Economic Forum suggest that the 4th Industrial Revolution now underway and that it requires different skills from the last IT driven revolution, and we are not really developing these skills well (Gray, 2016). In addition to "hard" technical skills required for a trade or occupation, the emerging industries require creativity, collaboration, emotional intelligence, judgment, and adaptive capacity. These "soft" skills, according to the World Economic Forum, are critical for new enterprises and for the reinvention of existing industry sectors. New trades and skill sets are emerging all the time – e.g., alternative energy consultant, wind finder, body parts engineer, mechatronics. Countries need learning systems which are quickly adaptable to emerging skill needs and which relies less of qualifications and more on competencies – a theme of a great many current conversations about skills, training, and lifelong learning (Veliente, et. al, 2019; Valiente, 2014; Zahidi, 2020; Scwhwab and Zahidi, 2020).

The Skills We Need to Build a More Innovative and Sustainable Economy

The ability of many countries to innovate is declining, not growing. We need the skills to problem-find, develop new products and services and get them to global markets faster than competitors. There is also a need for more agile and innovative public services, and effective non-profit organizations. There are a variety of profiles of this skill set, such as those suggested by the Conference Board of Canada[ii], but the key is to build the adaptive capacity of firms and organizations and to develop a problem-solving, growth-oriented mindset for all employees.

All these skills gaps require a response from colleges, universities, and training providers as well as from employers. Also responding are the major Massive Open Online Course (MOOC) providers – especially edX, Coursera and FutureLearn. Between them, these three MOOC providers attracted over 32 million new learners in 2020 many of whom pursued either MOOC based microcredentials or one of the sixty-seven MOOC based degrees or the over 1,000 microcredentials on offer (Class Central, 2020).

The Decline of the Degree and Diploma and the Importance of Skills

At the same time, employers are changing their hiring practices. Many, including major employers such as Google, IBM, Apple, EY (UK), Starbucks, Hilton Hotels and Penguin Random House, no longer demand a degree as a basis for employment – they focus instead on the skills portfolio and experience with a potential employee brings to their workplace (Connley, 2018). It is not that degrees are not seen as valuable, but more that there appears to be no necessary relationships between the holder of a degree qualification and the skills-sets which employers need. Indeed, degrees are seen by many employers as an unreliable indictor of specific skills, more as an indicator of generalizable skills.

Some employers, taking skill development into their own hands, have developed an approach to credentials in which they play a particular role. For example, Shopify hires individuals straight from high school and enrols them in a customized degree program offered in partnership with a local internationally recognized university – a degree they pursue while also working[iii]. AT&T – a major US employer - partnered with Udacity and Georgia Tech to offer a MOOC-based Master of Science in Computing Science. Over 3,000 individuals enrolled and the average time to completion was 6-12 months. Middlesex University (UK) has a long history of work-based learning accreditation leading to undergraduate, Masters and doctoral degrees earned based on work required activities and reflective learning and research. There are also degree apprenticeships, where an individual developing the skills of a specific trade is also enrolled in a degree program in which the mastery of skill is fully recognized for credit (Bravenboer, 2018).

Despite their concerns related to skills and the availability of highly qualified and talented people, employers also do not generally make significant investments in employee training and development, though there are exceptions. The average expenditure of firms around the world on employee training (2019) was US$1,308 – up just 12% over a decade[iv]. While this represents a significant amount – app. $86.7 billion in the US alone (Pontefract, 2019) – it also is the equivalent of twelve minutes of training in small to medium enterprises and six minutes in large corporations (Tschohl, 2018). Worse, so much of what constitutes training is seen as ineffective – just 12% of those who complete corporate training say that they apply the skills they learned at their workplace (24x7 Workplace Learning, 2015) and only 38% of managers believe that their investment in training and development meet their needs (ATD Research, 2015).

Understanding the Microcredential

One response to the skills shortages and learning challenge is to seek faster, smarter, and more efficient ways of reskilling and upskilling existing workers and to accelerate the entry of skilled labour into the workforce. Governments in Canada, Australia, Europe, and the US are investing in short forms of learning and training termed “microcredentials” and are encouraging (sometimes through funding or tax credits) the reskilling of workers whose work has been disrupted or the upskilling of workers in need of new skills to respond to changing skills requirements in their existing work.

But what is a microcredential? There is no agreed definition of what a microcredential is, despite concerted efforts by the EU (European Commission, 2020), UNESCO (Downes, 2021) and others to define this credential. Colleges and Institutes Canada (2021) has offered this definition: “a microcredential is a certification of assessed competencies that is additional, alternate, complementary to, or a component of a formal qualification”. To clarify, they then add these guiding principles related to the deployment of these credentials:

1. Microcredentials can be a complement to traditional credentials (certificate, diploma, degree, or post-graduate certificate) or stand alone.
2. Microcredentials are subject to a robust and rigorous quality assurance process.
3. Microcredentials should represent competencies identified by employers/industry sectors to meet employer needs.
4. Microcredentials may provide clear and seamless pathways across different credentials (both non-credit and credit) and may be stackable.

5. Microcredentials are based on assessed proficiency of a competency, not on time spent learning.
6. Microcredentials are secure, trackable, portable and competency is documented in students' academic records.
7. Microcredentials are to follow institutional approval processes.

- principles endorsed by several Canadian jurisdictions, even though many of the microcredentials offered in Canada are not endorsed by employers, industry or recognized accrediting body and are generally not competency-based (Lane and Murgatroyd, 2021).

UNESCO's draft definition (Downes, 2021) is similar, though is more open to non-skills based (knowing how to is not the same as being able to demonstrate a specific skill):

A microcredential:

1. Is a record of focused learning and achievement verifying what the learner knows, understands or can do;
2. Includes assessment based on clearly defined standards and is awarded by a trusted provider;
3. Has stand-alone value and may also contribute to or complement other micro-credentials or macro-credentials, including through recognition of prior learning; and
4. Meets the standards required by relevant quality assurance.

MOOC providers such as Coursera, FutureLearn and edX also offer microcredentials, though for competitive advantage reasons have chosen to name them in a variety of ways (e.g., nanodegrees, professional certificates, MicroMasters, Graduate Certificate) even though they display similar properties. All require significant time commitments (between 5 and 10 hours a week) for a sustained period (between 3 and 5 months). One key to the success of MOOC-based microcredentials is that many are available on demand, rather than offered by semester.

Some companies are also offering microcredentials. Included amongst these are Google, Amazon, Microsoft, Amazon Web Services, IBM either on their own or in partnership with a post-secondary institution or other certified provider. Professional associations and accrediting bodies are also providing microcredentials, such as those offered by the Certified Professional Accountants of Australia[v].

A great many, but not all, microcredentials are offered through online learning and many leverage both creative and innovative designs and video-based assessment of skills, competencies, and capabilities such as that provided by Valid-8 (Murgatroyd, 2018). While some require course learning and learning activities, others are offered by assessment of skills and competencies independent of whether the person being assessed has taken any courses.

The Challenge of Microcredentials

Early adopters of microcredentials have made the emerging landscape very complex and "messy". Some of the short courses created are too short (minutes or a few hours rather than weeks or months) and more closely resemble learning snippets or microlearning (Corbeil, Khan and Corbeil, 2021). Other have broken exiting diploma or degree courses into incoherent sub-sets and offering these sub-sets as microcredentials. Some are not basing a microcredentials on skills in demand and competencies, but instead offering content and assessing knowledge and understanding rather than skills and capabilities. These developments leave a policy and

program development landscape as a policy "swamp" and have fueled both practical and ideological criticism (Wheelahan and Moodie, 2021; Boud and Jorre de St Jorre, 2021)

There are five significant challenges

1. **Relevance & Rigour** – to meet government and public expectations, a microcredential needs to directly focus on skills, competencies and capabilities and the knowledge needed to enable the demonstration of skills. The focus needs to be on skills in demand or needed to enable productivity growth, competitiveness and innovation and agility. Microcredentials sponsored by industry, such as Siemen's mechatronics programs, Amazon's cloud management certification or the REVIT certification for architecture technicians are examples of relevant, rigorous and competency focused courses for skills in demand.
2. **Transparency** – the assessment of competency needs to be transparent. Video-based evidence of demonstrable skills or other forms of evidence which can be viewed by employers are preferable to more traditional academic assessments or multiple-choice examinations. Employers need to know exactly what the holder of a microcredential can do – it has to be legally defensible. Many academic assessments are not.
3. **Portability** – a microcredential needs to be accepted in a variety of jurisdictions, not just one. For example, Microsoft certification is valued world-wide as is Siemens mechatronics certification. A certificate issued by a college or university has to be portable and accepted across many jurisdictions for it to have value.
4. **Quality** – for a microcredential, the key focus for quality assurance needs to be on the rigour and efficacy of assessment. While course content and the qualifications of instructors may be important, the critical success factor is relevant, rigorous legally defensible assessment. Most quality regimes applied to colleges and university are not appropriate for assessing the quality of microcredentials, especially those awarded through "assessment only" – i.e., which do not require or involve instruction or course work. Quality and rigour are major challenges for these fast-growing credentials (Krupnick, 2018).
5. **Impact** – from a policy perspective, the question to be asked is whether available microcredentials reduce the skills gaps in specific industries and increase the employability of the holders of the credential. This requires institutions to track the subsequent employment behaviour of credential holders and employer satisfaction with their micro credentialed employees. All other measures and indicators are secondary.

Several institutions offer what they refer to as modular, stackable, and transferable microcredentials. Three or four short courses are "stacked" to make for a single microcredential which than can be transferred into a degree or diploma. For example, Athabasca University's non-credit certificate in manufacturing management can be used as an elective in that university's MBA program.

A record of student achievement, often including samples of their skilled work and testimonials related to their achievement, is usually provided electronically as an e-portfolio or in an e-wallet. The registrars of all of the Canadian colleges and universities recently agreed to use a common platform for such purposes - MyCreds™ (now part of Parchment™) and other jurisdictions have chosen other platforms. This too is adding to the complexity of these developments and raising issues about what should and should not be included in the record of achievement, what is and is not "transcriptable" and who owns the record.

David Boud and Jorre de St Jorre (2021) has raised significant issues about the ways in which the emergence of short-form learning may impact long-form learning in colleges and universities. His key observation is that degrees, diplomas and other long-forms of learning are becoming less fit for purpose – too many of them are "padded" with content which students do not find of value and assessment practices are, to say the least, questionable. For example, not all course objectives or competencies which it is said the course involves are systematically assessed. In the Canadian Red Seal for plumbing, for example, there are close to 3,000 competencies specified and very few of these are ever assessed and assessment of these competencies is inconsistent between institutions offering this apprenticeship program. Boud and Jorre de St Jorre conclusion is that effective deployment of microcredentials will result in challenges to our understanding of diplomas and degrees.

The Future of Microcredentials: Digital Disruptors or More Systems Noise?

Many graduates holding degrees work in jobs which do not require them. A Statistics Canada (2021b) study shows that the overqualification of employees was app. 16.7% of those who graduated in 2012 and 2013 and is much higher for black women (23%) than white women (14.8%) and for men (17.7%) than for women (15.2%). In the US., according to the Federal Reserve, some 41% of recent graduates work in jobs which do not require a degree (Redden, 2020). Many fast-emerging occupations, for example in STEM, do not require a degree – some 35% of those working in STEM industries do not have a degree and an additional 14% have some college education, but not a degree (Smith, 2021). Given the rising costs of a four-year degree or of master's degrees, microcredentials (especially those that are stackable and transferable) may become a preferred route to work, learning, credentials, and skills. A combination of this development and the rapid growth of MOOC-based credentials pose a significant threat to established universities and colleges.

Part of the response from colleges and universities is to dilute the potential of microcredentials as digital disruptors by flooding the market with short courses they claim to be microcredentials, but which are not competency-based, do not have industry support, and are not linked to known skills in demand. They are also rarely available on demand. In addition, they are seeking to create a quality assurance framework for these qualifications which inhibits the entry of new players into "their" (*sic*) market. To further constrain the market, many of the post-secondary credentials are not stackable or transferable and do not tie to existing credentials – these courses have become known as "floaters" or "teasers", intending to show what university or college learning is "really all about" but have no transferability.

Such a response is understandable. In highly constrained fiscal environments, which are both highly regulated and unionized, flexible and innovative responses to skills in demand is unlikely to be a "good fit" to their traditional modes of operation of colleges and universities. Faculty are reluctant to embrace competency-based assessments (Booth, 2000; Dickson and Bloch, 1999) or to change their teaching behaviours in radical ways (Murgatroyd, 2020). Microcredentials are not intended to be old wine in new bottles, but a new approach to teaching, learning and assessment driven entirely by industry and employer needs. They are more than "innovation theatre" (Ralston, 2021).

It will take time for this emerging field of short, focused, skills-based learning based on competencies and legally defensible assessment to "shake out". The tragedy of the pandemic is that it has made closing the skills gaps and making learning smarter, faster, and better much more urgent. Governments are likely to become increasingly frustrated by their significant expenditures and focused support for microcredentials when they fail to produce the outcomes and impact intended, and it may encourage them to look differently at the private sector and MOOC providers.

The current college and university strategy of blitzing and confusing the market with a plethora of products in the pursuit of quick revenues may backfire. MOOC providers will benefit, as they already have, by expanding their microcredential and degree offerings and by growing the transferability of their products into more conventional institutions. Now that Coursera has significant capital to invest – its move from being a private company to being publicly traded has released significant new funds – we can expect more corporate partnerships and focused, competency-based credentials from them and their colleagues at FutureLearn and edX (both also recently acquired by new owners).

A probable future is for many more MOOCs to find their way into mainstream offerings by means of both prior learning assessment or direct transfer into diploma and degree programs. This already happens in a limited way. A student may enroll, for example, in a MOOC focused on statistics and data science from the suite of MicroMasters courses offered by MITx and then transfer their completed learning certification to the graduate program at one of the 22 MIT pathway universities worldwide that accepts these courses for credit. Similar arrangements exist for other MOOCs. Expanding these developments both creates modular, transferable short form learning, lowers the cost of learning, and increases accessibility.

We can also anticipate the significant growth of assessment-based credentials, such as those offered by the University of Wisconsin's Flex option, or the competency-based assessments offered by Western Governors University (Staker, 2012). Students do not take courses but, on demand, ask to be assessed for their knowledge, skills, and capabilities and, using "always available" assessment instruments (aided by the deployment of artificial intelligence assessment engines), are granted credit towards a diploma or degree. Rather than be concerned about how the knowledge and skills were acquired, the institution becomes much more focused on the quality of skills-based assessment.

What is clear is that the microcredentials market is currently messy and will only confuse and complicate the skills agenda in many jurisdictions. Until industry and government act to reshape the market, the potential of microcredentials will be lost in the mists of missteps and misunderstanding. It is time for change.

End Notes

[i] See various editions of the Canada Productivity Review at http://www.statcan.gc.ca/pub/15-206-x/15-206-x2014037-eng.htm

[ii] The Conference Board of Canada suggests the skills needed to support innovation http://www.conferenceboard.ca/cbi/innovationskills.aspx and also the key employability skills at https://www.conferenceboard.ca/edu/employability-skills.aspx

[iii] For more information, see https://devdegree.ca/

[iv] Based on https://www.statista.com/statistics/738519/workplace-training-spending-per-employee/

[v] See https://www.cpaaustralia.com.au/career-development/courses-and-events/courses-and-online-learning/micro-credentials for details.

[vi] See https://mycreds.ca/2020/06/15/arucc-partners-with-digitary-to-build-the-canadian-national-network-called-mycreds/

[vii] See https://www.digitary.net/digitary-and-parchment/

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