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Labour Education Applied Research North (LEARN)

MICRO-CREDENTIALING IN NORTHERN ALBERTA

Final Report

March 5, 2021

Academica acknowledges that our offices are located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewuk and Attawandaron peoples, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. This land continues to be home to diverse Indigenous peoples whom we recognize as contemporary stewards of the land and vital contributors of our society.

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Executive Summary

Over the past few years, the conversation about micro-credentials has grown louder across the postsecondary education (PSE) sector as we have considered the future of work and the impact of automation and artificial intelligence (AI). The current pandemic reality has served to further amplify the volume, as there has been an intensification of automation, dramatic job loss, redistribution of jobs to knowledge-intensive sectors, and changes in working conditions including place of work and working hours. For example, in Ontario, job change and job loss due to the pandemic affected the younger demographic aged 15-24 and those without any postsecondary education the most (Davidson, M. and Ruparell, S., 2020).

The rapidly evolving world has created a gap between higher education and labour market needs. Some futurists, like Joseph Aoun (2016), believe that alternative credential programs that offer less expensive, focused training that are shorter in duration are the new future for delivering postsecondary education (PSE). Furthermore, governments are relying on micro-credentials as a cornerstone in their economic recovery plans, including as a response to required emergency skills. This has been voiced by governments in Ontario, British Columbia and Alberta. Most colleges and institutes, including those in Alberta, have a mandate to serve the needs of industry and support economic development.

This report provides a high-level exploration of some of the emerging themes, policies and strategies around micro-credentials in Alberta, Canada and beyond. The purpose of this report is to:

1) Inform decision-making to improve existing micro-credentials or introduce new micro-credential programs in northern Alberta;

2) Ensure that the LEARN members, industry and government are well-situated to take advantage of any opportunities micro-credentials could provide; and

3) Inform future research regarding micro-credentials.

Definition of Micro-credentials

One of the first challenges revealed by the research is that there is no standard or commonly accepted definition of micro-credentials in the postsecondary sector. As well, there is as a lack of familiarity with the term among employers and industry. In order to develop some common understanding, the project team developed a working definition of micro-credentials for further consideration by the Labour Education Applied Research North (LEARN) partners.

Micro-credentials are awarded upon the successful completion of an assessment of a particular skill or competency, associated with short, specific and focused training, and are designed to be beneficial in obtaining employment or meeting on-the-job educational requirements.

Frameworks for Offering Micro-credentials

Connected to the definition of micro-credentials is the framework for offering this method of learning. Postsecondary education is no longer a point in time event, but rather a lifelong journey. It is estimated that today's graduates will hold the same job/position for three to five years (Alberta Colleges Economic Recovery Task Force Report, 2020). The majority of micro-credentials focus on a specific skill or knowledge that workers can use to upskill or reskill while currently employed. As institutions have traditionally offered this type of training through continuing education or contract training, there are many aspects to consider when developing new frameworks for offering micro-credentials.

Accessibility

Institutions, particularly those in northern Alberta, must consider how to engage and serve rural and Indigenous populations. Considerations include those around engaging rural and Indigenous populations, providing regionally appropriate skills training, a lack of reliable internet in these communities decreasing access to remote learning, and the importance of developing key relationships with industry and within the communities.

Systems, Technology and Verification

One aspect for consideration when developing micro-credentials is the method by which they are recorded, stored and verified by the institution. Postsecondary institutions have always stored, in their student information systems, data which is used to verify credentials such as degrees, diplomas, and certificates. Micro-credentials may require added complexities such as digital images, managing credentials from more than one institution, a method of verification embedded in the representation of the credential, and use of Blockchain to ensure the integrity of the digital credential.

Private Labelling or White Boxing

One means by which institutions can increase or develop new micro-credential offerings is through private or third-party hosting of the certifications. This provides the institution with increased micro-credential opportunities without having to develop a digital credential infrastructure. Private labelling would allow an institution or consortia to wrap the credential infrastructure in its own brand or identity. This would help maintain a connection with students and employers, providing a more familiar vehicle by which various stakeholders could recognize the value of the educational attainment and achievement.

Partnerships

There are many opportunities within micro-credentials to develop partnerships in order to improve or expand offerings. Partnerships with industry, government and other postsecondary institutions may provide content and resources, as well as leverage particular strengths. In addition, community partnerships, such as those with regional Indigenous communities, can increase awareness and advance reconciliation.

Opportunities for LEARN Members

There are varied opportunities for LEARN members to increase or improve micro-credential offerings individually or as a consortium. The LEARN institutions should consider which micro-credentials best serve the regional population and how to deliver these credentials. The Alberta Colleges Economic Recovery Task Force Report (2020, p. 10) recommends several competency skills highlighted by employers including:

- Problem-solving
- Service orientation, team and interpersonal skills
- Commitment to quality
- Basic literacy and numeracy, business acumen, science and math skills
- Digital literacy

The labour market analysis conducted pointed to skills needs in these areas. For example, customer service and quality assurance were both included in the top skills mentioned in job postings in northern Alberta. Further, stakeholder consultations revealed soft skills (e.g., communication, conflict-resolution), essential skills, and technical skills as potentially suitable for micro-credential delivery.

Future Research

Due to the responsive nature of micro-credentials and their need to stay current with labour market demands, an on-going program of research needs to be conducted. Labour market research, environmental scans and program feasibility assessments will be required to guide and reassess offerings. In addition, the LEARN members may wish to conduct deeper analysis of any of the themes covered in this report, in order to guide future collaborative actions.

Recommendations

Based on analysis of these themes as well as feedback collected in the workshop conducted with participation from LEARN members, it is recommended that LEARN members pool resources to develop and offer micro-credentials specific to the northern Alberta region. In addition to realizing operational efficiencies, the LEARN members could partner with local industry, government and communities to develop a common understanding of

micro-credentials, collaborate on workforce-responsive micro-credential offerings and increase educational accessibility in the region.

Implementation

This report makes an inceptive recommendation for next steps toward collaborative LEARN implementation of micro-credentials. The first step is to establish a common definition for, terminology around and framework for micro-credentials. LEARN members should then determine a collective offering of micro-credentials in areas of current demand and potential future growth, that may include specific industry training as well as soft skills training that is in demand. The partners also need to consider a system for laddering and transfer of micro-credentials among the institutions as well as new collaborative offerings.

Introduction & Method

There is increasing interest in micro-credentials as a training tool that can help to address skills gaps to meet workforce needs. Is this a fad that will not rise to the anticipated potential, like Massive Online Open Courses (MOOCs), or are micro-credentials developing into a new future framework for postsecondary education? Successful implementation may depend on postsecondary education's ability to pivot to labour market and industry needs. As well inducements like government funding or enrolling new students who may not have previously considered postsecondary education can contribute to successful implementation.

The Labour Education Applied Research North (LEARN) partners contracted Academica Group to conduct research and provide recommendations regarding:

- Different types of micro-credentials and context in which they are most effective;

- Potential program and skills gaps that could be addressed through-micro-credentialing from the perspective of northern business and industry employers;

- Development of micro-credentials, recognition and transferability of credits, formats of delivery, etc.; and

- Identification/verification, authentication, privacy and information security related implications etc.

In order to achieve these research objectives Academica followed a three-phase approach of:

1. Discovery and Research

2. Analysis

3. Report and Presentation.

Research Approach

The Discovery and Research phase involved a comprehensive program of quantitative, primarily secondary data, and qualitative research that included:

- Literature Review

- Micro-credential Trends Scan

- Alberta Institutions Micro-credential Programs Review

- Stakeholder Interviews

- Labour Market Research.

Literature Review: This study included review of policy and strategies in place around micro-credential programming in Alberta, Canada and elsewhere including modalities of delivery, industry recognition, input and approvals, full load equivalent (FLE/FTE) impacts, and transferability.

Micro-credential Trends Scan: Focused on current trends and emerging issues at institutions from across Canada regarding micro-credentials. The scan looked at news articles via Google News search queries, as well as the *Academica Top Ten* archives, for news dating back to November 2019.

Alberta Institutions Micro-credential Programs Review: From publicly available sources and with assistance from partner institutions, Academica compiled a list of current micro-credential offerings (where available) from post-secondary institutions across Alberta.

Stakeholder In-depth Interviews: These interviews provided an effective way to engage these important stakeholders and garner valuable information, allowing individuals to clearly share their points of view. Target Audience(s) identified included:

- Colleges and universities located in northern Alberta

- Northern Alberta employers.

Labour Market Research: Using Labor Insight™, Academica conducted regionally- and provincially-focused labour market research specific to micro-credentials. The database for Labor Insight™ includes almost 10 million current and historical job postings in Canada collected from 4,000 online job sites (since 2013), resulting in a comprehensive real-time and trending portrait of labour market demand. This research includes insights into specific skillsets, top employers, emerging and in-demand occupations, and industry trends.

Analysis and Recommendations: In the second phase of the project, Academica facilitated workshops with the LEARN members to explore themes related to micro-credentialling that arose from the Discovery and Research Phase. These workshops helped to form part of the analysis on which recommendations were made. A summary of the workshop can be found in Appendix D of this report.

Definition of Micro-credentials: For the purposes of this research project, and particularly for use in the stakeholder interviews, the research team used the following working definition:

> *Micro-credentials are awarded upon the successful completion of an assessment of a particular skill or competency, associated with short, specific and focused training, and are designed to be beneficial in obtaining employment or meeting on-the-job educational requirements.*

Findings

LITERATURE REVIEW

One of the key themes from the Alberta Colleges Economic Recovery Task Force's recommendation report was a focus on micro-credentials and addressing skills gaps in a sustainable way. Recommendations called on the Government of Alberta to "directly fund industry to contract with [Comprehensive Community Colleges] CCCs that have strengths in the subject for the development and implementation of new micro-credentials which are directly linked to in-demand skills," (Alberta College Economic Recovery Task Force, 2020, p.5). As such, it is expected that a focus on micro-credentials within the Alberta postsecondary framework is on the horizon. The concept behind micro-credentials is not new: short, efficient and effective training has been offered for years through continuing education, industry certifications, professional development, and corporate training (Oliver, 2019, p.19). Micro-credentials themselves, however, are becoming increasingly relevant in a time of uncertain economies, shifting skills needs, technological disruption, and changing demographics of the learners themselves.

Defining Micro-credentials

A primary challenge around micro-credentials is the lack of a clear, concise definition of what they are, who they serve, and the role they play within the formal higher education landscape (State University of New York, 2018; Oliver, 2019; Pichette, Tamburri, McKeown, Blair, & MacKay, 2020; Duklas, 2020; Pichette, 2020). With the rise in popularity of micro-credentials, institutions are beginning to develop frameworks, but inconsistencies and lack of guidance are a challenge at the institutional implementation level (Johnson, Bates, Donovan, & Seaman, 2019). While definitions provided in the literature use common language and terminology, the fact that there are so many different classifications speaks to the need for a standardized framework. Organizations and institutions across the world are in the process of developing methods of classifying, assessing, and implementing micro-credentials as this need grows (Cirlan & Loukkola, 2020; eCampusOntario, 2019; European MOOC Consortium, 2019; Government of Australia, 2019; New Zealand Qualification Authority, n.d.; State University of New York, 2018; Algonquin College, 2019; FutureLearn, n.d.).

Throughout the literature, authors provide definitions of micro-credentials based on their own key findings and understandings. Aspects of Beverly Oliver's definition are often referenced, for example.: "… a micro-credential is a certification of assessed learning that is additional, alternate, complementary to or a formal component of a formal qualification," (Oliver, 2019, p.19). Joanne Duklas borrows from this to add important aspects related to

transfer and admission to postsecondary institutions (Duklas, 2020). The State University of New York's (SUNY) recommended wording is another foundational definition that identifies micro-credentials as verifying, validating, and attesting that specific skills or competencies have been achieved. SUNY goes on to state that "they differ from traditional degrees and certificates in that they are generally offered in shorter or more flexible timespans and tend to be more narrowly focused." SUNY's definition of micro-credentials lends itself both to mobility within the higher education sector, but also within the workforce, emphasizing the employability opportunities of micro-credentials (State University of New York, 2018). This is important to note, as micro-credentials are described by multiple authors explicitly in terms of their applicability to and direct alignment with specific employment opportunities (Brown & Kurzweil, 2017). It is also important to note that SUNY includes in its definition both credit and non-credit study, as many institutions are currently struggling with how to fit micro-credentials into their existing credit framework.

Terminology adds another layer of complexity when it comes to defining micro-credentials. Some researchers use the term alternative credentials as an umbrella term to include everything from bootcamps to badges to micro-certifications to nano-degrees, while others use the terms badging and micro-credential interchangeably (Duklas, 2020; Kato, Galán-Muros, & Weko, 2020; Buban, 2017). It is generally agreed based on more recent works that digital badges are essentially the proof that a micro-credential has been obtained. They are a digital, verified credential that in many cases can be transferred and recognized across institutions and employers (Fong, Janzow, & Peck, 2016).

Micro-credentials can also be approached from the perspective of where in the student or worker lifecycle they occur. Oliver describes micro-credentials as a "signal of achievement" that can be separate from or interact with formal educational qualification as: alternative entry tools or pathways; value-add modules during credentialed programming; or as 'last-mile' services for learners nearing graduation (Oliver, 2019, p.19). Another study revealed the trend of online micro-credential providers repackaging or stacking their existing courses in order to expand their offerings and create even more modular alternatives for learners (Brown & Kurzweil, 2017). These examples demonstrate the flexibility of not only micro-credentials themselves but also their use in the academic, vocational, and professional environment.

Micro-credential Frameworks

The approach to micro-credentials at the jurisdictional level is quite varied. In the European Union, a micro-credential is defined as "a proof of the learning outcomes that a learner has acquired following a short, transparently-assessed learning experience. They are awarded upon the completion of short stand-alone courses (or modules) done on-site or online (or in a blended format)," (European Commission, n.d.). The European Union has initiated a large project to implement micro-credentials and place them within the larger

European Credit Transfer and Accumulation System. This system categorizes the course or module both by level and credit value. Credits are determined based on learning, study and assessment duration, with approximately 25-30 hours per credit and 60 credits per year for a full-time student (European Commission, 2017).

New Zealand has adopted a national approach, with micro-credentials included within the quality assurance framework. A micro-credential is defined as one that "certifies achievement of a coherent set of skills and knowledge; and is specified by a statement of purpose, learning outcomes, and strong evidence of need by industry, employers, iwi[1] and/or the community" (New Zealand Qualification Authority, n.d.).Micro-credentials are smaller than a qualification and focus on skill development opportunities not currently catered for in the regulated tertiary education system. At a minimum, micro-credentials will be subject to the same requirements as training schemes or assessment standards. According to the framework in place by New Zealand, a micro-credential must be 5–40 credits in size, where a credit is 10 notional learning hours, with 120 credits normal for a full year, full time student (New Zealand Qualification Authority, n.d). Micro-credentials must have strong evidence of need from employers, industry and/or community and must be reviewed and reapproved annually. The micro-credential cannot duplicate current quality assured learning approved in other qualifications. The government will publish approved micro-credentials and students can have a completed micro-credential put on their national record of achievement, consistent with credentials (New Zealand Qualification Authority, n.d).

The province of Ontario is working towards a definition of micro-credentials, with eCampusOntario, a publicly-funded non-profit organization in the postsecondary sector, leading the charge. eCampusOntario defines a micro-credential as "a certification of assessed learning associated with a specific and relevant skill or competency. Micro-credentials are to enable rapid retraining and augment traditional education through pathways into regular postsecondary programming. Ontario has initiated a micro-credentials pilot, where micro-credential training is understood as short-duration (i.e., no more than 500 hours), industry-sensitive (i.e., meets the needs of industry and employers) training that equips participants with a defined set of skills and knowledge to improve overall employability and labour market resiliency," (eCampusOntario, n.d.). Ontario has a stated desire to integrate micro-credentials within the credential system, but is still in the early stages. The province has not made changes to other policies that address issues such as approval, quality assurance, tuition, or funding that are essential to developing a comprehensive framework.

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[1] New Zealand Indigenous Peoples; Māori-language word meaning "people" or "nation"

Increasing Demand for Micro-credentials

There is a documented increase in demand for micro-credentials that can be attributed to a number of different factors (Kato, Galán-Muros, & Weko, 2020). These factors include the rise of the non-traditional learner, shifting student demographics, industries that are changing and adapting to new economic environments, technological disruption, a growing interest in lifelong learning, and occupations that are becoming more dynamic in terms of roles and skills needs. Further, learners themselves are approaching education in more non-linear ways (Brown & Kurzweil, 2017; Auger, Irwin, Desetti, Bender, & Craney, 2020). One study that looked at these trends within the US context found that traditional bachelor's level education "may not be suited for some of the millennial generation, and that other types of learners may favour an educational credentialing system built around recognition for learning outcomes in the form of competency badges or certificates" (Fong, Janzow, & Peck, 2016). A whitepaper by online learning platform Desire2Learn makes recommendations for policy-makers, employers, educators, and learners that include addressing a demand for lifelong learning through more modular and mastery–based programming, expanding the options for "skills-based courses", stackable micro-credentials, and Prior Learning Assessment and Recognition (PLAR) services to assess and verify existing skills (Auger, Irwin, Desetti, Bender, & Craney, 2020).

Micro-credentials are becoming important for employers as they face a skills gap among current employees, particularly in areas of technology, business, management and critical thinking (McKinsey & Company, 2020). A report commissioned by the Higher Education Quality Council of Ontario (HEQCO) also sheds light on the importance of micro-credentials for those mid-career workers who may require further training. The report discusses the need for more diverse and accessible adult training opportunities and stresses the value of competency-based education (CBE) (Pichette, Tamburri, McKeown, Blair, & MacKay, 2019). The impact of layoffs due to the COVID-19 pandemic is also a driver behind increased need for and interest in micro-credentials. The Ontario Government announced in its action plan new investments into developing a micro-credential strategy in order to meet this need (Government of Ontario, 2020).

The concept of reskilling and upskilling is extremely important in the discussion of micro-credentials. It brings up questions around prior learning assessment, lived experience, and making lifelong learning accessible to all. Dynamic industries and unstable or undiversified economies means many people in the workforce will switch occupations over the course of their career, or at least require training in areas where their industry has advanced. Contact North specifies the target audience for micro-credentials in Ontario as unemployed or laid off workers who need to reskill, individuals who need to upskill, or independent contractors working in fast-changing industries (Contact North, 2020).

Quality, Validity, Verification and Assessment

While Canada does not yet have a framework for validating and verifying micro-credential qualifications, it is anticipated that a framework is approaching at least at the provincial levels, with provinces like Ontario working toward developing such a framework now (Contact North, 2020; Davidson & Ruparell, 2020; eCampus Ontario, 2019). As institutions work towards preparing for a framework, it is important to consider issues of accreditation, the quality and rigour of the assessment involved, and the transferability and mobility of the credentials themselves (Buban, 2017). Assessment and validity, as well as vetting the quality of providers and the content itself, were key concerns addressed in the literature (Contact North, 2020). One study from 2017 concluded that at this time, as micro-credentials were still being established, quality assurance is not strong and this creates an issue of trust, particularly among employers but also among students and institutions (Brown & Kurzweil, 2017). Oliver established the importance of building trust around micro-credentials by properly defining them, clarifying standards, aligning them with qualification levels, ensuring robust assessment and governance, and developing a proper tool for learners to communicate their competencies (Oliver, 2019, p.19). Trust and authenticity are key themes across the research as they hold implications not only for students looking for micro-credentials but even more so among institutions and employers who are assessing the skills of a potential student or employee (Duklas, 2020). Even as employers view micro-credentials as especially important to bridging the skills gap among employees, a clear framework needs to be established in order to ensure authenticity, and institutions need to work with industry in order to properly build the curriculum (Gauthier, 2020). Employers stressed that the validation of skills and competencies is the most important aspect, noting the benefit of a "registry" to track credentials (Gauthier, 2020).

Distinguishing between non-credit and credited micro-credentials is a challenge for the postsecondary sector that brings up critical questions around how micro-credentials are assessed, awarded, presented, accepted, and transferred (Buban, 2017; Rockwell, 2020). Many argue that micro-credentials and their associated proof of competency need to include both formal and informal learning experiences (Duklas, 2020; Auger, Irwin, Desetti, Bender, & Craney, 2020). This also speaks to the way learners are able to present these proofs, and the ability for employers to verify these credentials. Whether used as PLAR or as proof of competency from formal instruction, students need to be able to document and share their achievements in a unified way. Digital badging is a popular means of displaying these credentials as it typically employs secure technology, such as Blockchain. In the education space, many organizations have turned to third-party technology companies to administer credentials, such as Badgr or Credly, while some institutions opt to build their own digital transcripts. This space is relatively new and there have been a number of pilot projects around the world, with some Canadian institutions launching the technologies on their own (Duklas, 2019)

Delivery Models

Various delivery models are discussed in the literature and some have been piloted by institutions across the world. The relatively new territory of micro-credentials has led a number of institutions to join a consortium or partner with industry for delivery (Presant, 2020; Oliver, 2019, p.19). Ontario has now established a micro-credential principles and framework document to guide institutions through launching an initiative, and has funded 14 pilot projects across the province (eCampusOntario, 2020). Along this same vein is the European MOOC Consortium that involves a number of institutions and ed-tech companies and has also established a clear framework from which to build a micro-credential "eco-system" (European MOOC Consortium, 2019).

Leading companies, particularly in the information technology sector, have long provided digital credentials for accomplishing modules, online workshops, bootcamps, and associated assessments that certify at a granular level the skills and competencies obtained. IBM, Amazon, Siemens, Cisco, and Google are among the higher-end providers. Beyond these larger companies that offer proprietary training, there are the popular MOOCs platforms such as Coursera, edX, and FutureLearn which also offer individual, often non-credit courses. Other companies such as RapidSkills, UGotClass, and ed2go have recently developed partnerships with institutions across Canada. A report published by eCampusOntario on the various business models of micro-credential delivery focused on five overall models: the solo unit; the solo institution; a peer consortium; non-governmental organization-led; and industry-led. The report notes that these are not mutually-exclusive and some that are delivering as a solo institution may also be part of an industry-led delivery model, for example (Presant, 2020).

Beyond the high-level policy and regulatory challenges are those practical considerations that institutions will need to address (Peter Gooch and Associates, 2020). Issues such as cost, human resources, course development, departmental ownership and technological infrastructure may be barriers for some institutions to enter into the world of micro-credentialing. Many institutions have begun the process of creating a framework for micro-credentials either credited (Algonquin College, 2019) or non-credited (University of Alberta, 2020) that fits within their overall qualification ecosystem.

One of the most challenging considerations around micro-credentials is what, exactly, they will look like and how they will fit into the larger realm of postsecondary education in Canada and in Alberta. There is a need for governance and regulation around the delivery and assessment of micro-credentials that should involve institutions, regulatory and licensing bodies, industry associations, employers, and government.

SYSTEMS, TECHNOLOGY AND VERIFICATION

Canadian degrees, diplomas and certificates have been digital, in a sense, for more than 20 years. Colleges, technical schools, and universities electronically store the fact and the proof that someone has earned a credential, in their student information systems. If a question arises as to the authenticity and accuracy of a postsecondary degree or certificate such documents and the achievement they represent are validated against electronic records in the granting institution's student information system (SIS). The validation is conducted by institutional staff who compare the document and the claim it represents against the student information system (SIS) data. The academic transcript includes this information and is derived from the same electronic data. The documents awarded at convocation, while important in publicly recognizing accomplishment and achievement, could also be considered ceremonial given that the validity of the document rests on electronic information.

With current credentials relying on electronic information they share a few things with digital credentials, including digital badges. However, they do differ in a number of aspects. First, the visual representations of digital credentials, such as badges, are electronic images in standard formats such as "png" or "jpg", rather than printed documents. It is possible to print such electronic images but they lack the formal 'look' of the credentials awarded at convocation. There are examples of digital credentials that simulate the look of current paper credentials (Accredible, n.d.).

Second, in their electronic format digital credentials have an inherent method to verify their authenticity. The verification method establishes that the digital credential presented matches and is unaltered from the one issued to, and earned by, the learner. The method of verification is a link embedded in the visual representation of the badge. One of the challenges of this approach is that although badges can make use of significant security features they do rely on the experience of the individuals making the verifications. Digital verification, therefore, will compete with phone calls to institutions and requests for transcripts.

Third, while institutions typically store the electronic information which validates credentials, digital credentials are normally stored by organizations and service providers. Additionally, these service providers can hold badges from multiple sources whereas institutions only store information related to their own students. Similar to many new fields there are a number of organizations in this space. The Badge Wiki lists 25 organizations operating in the digital badge space including some of the organizations currently used in Alberta, such as Badgr, Acclaim/Credly, and OpenBadges.org (Badge Wiki, n.d.).

Finally, institutional credentials represent relatively larger learning experiences and achievements than typical of digital badges, the most common form of digital credential. While the terms digital credential and digital badge are sometimes used interchangeably, digital badges are typically a subset of digital credentials. This is changing, however, as higher education moves to adopt the same technologies to their current credentials. For instance, the Association of Registrars of the Universities and Colleges of Canada (ARUCC) and their MyCreds[TM] initiative draws on digital credential technology as a means by which higher education can transform their credentials to fully digital credentials.

The University of Lethbridge (U of L) is at the forefront of adopting digital credentials, being among the first institutions in Canada to join MyCreds[TM]. The U of L shared details about their participation in MyCreds[TM] during a recent interview. Some of U of L's graduate programming might be made available through micro-credentials; however, U of L will first use MyCreds[TM] for undergraduate and graduate degrees. As indicated in the U of L's press release "Graduates from the October 2020 convocation and future graduating classes will benefit from digitized credentials," (University of Lethbridge, 2020). The University plans to consolidate credential verification through MyCreds[TM], adding the credentials of former graduates to the system on an ad hoc and as requested basis. The U of L degrees are available as secure PDFs hosted on a secure site (MyCreds[TM]). In the future the U of L looks forward to adding transcripts, along with standard format meta-data so receiving institutions can appropriately store and process the information. This will change business processes so that degree verification and transcript issuance will, with few exceptions, be handled by MyCreds[TM]. When the U of L is ready to offer Micro-Credentials, MyCreds[TM] will also be able to accommodate these.

As an initiative spearheaded by a national post-secondary association MyCreds[TM] offers both a technical platform and forum for the development and evolution of digital credentials. This can help in both recognizing digital credentials and in allowing institutions to quickly adopt the technology. There is considerable national and provincial interest in this fast-moving initiative. Recently, Bow Valley College announced their intention to join MyCreds[TM] and that as of February 1, 2021 will issue all official transcripts through MyCreds[TM] (Bow Valley College, 2021).

Digital Credentials, Badges and Micro-credentials

Like digital credentials, digital badges visually represent activities, events, achievements and accomplishments. A distinction between badges and micro-credentials may be somewhat artificial, especially as credentials as we know them move to the digital space. Digital badges are essentially a modern form of recognition and cover a span of activities or accomplishments ranging from listening to a podcast to proof of an in-demand skill, or mastery of a competency. It is also important to distinguish between how something looks and what it symbolizes.

Blockchain

The technologies underlying digital credentials share features with the technologies which enable secure commerce on the internet and the emergence of new forms of currency, such as Bitcoin. From a security perspective the most robust form of technology employed is Blockchain (Puthal, Malik, Mohanty, Kougianos, & Das, 2018). A Blockchain digital credential would consist of a certain quantity of data and metadata including the hash of a previous Blockchain. A "hash" is an algorithmic function (eg. SHA 256) which converts an input of letters and numbers of any length into an encrypted output of a fixed length. As long as the same input is run through the same function it will generate the same encrypted output (hash), ensuring data integrity. A cryptographic hash is applied to the data and metadata in a Blockchain digital credential, and the result contains the data, the hashed value of that data, and the hash of the previous block's data. A subsequent block would contain its own data and metadata, which would yield a unique hash value, plus the hash of the previous block's metadata (Crosby, Nachiappan, Pattanayak, Verma, & Kalyanaraman, 2015). Each block contains not only its own unique hash "fingerprint" but that of the previous block, hence a chain. If the data in a block is tampered with then the hash value generated by that data will not match the value in the subsequent block, and the chain will be broken. This coupled with the distributed nature of Blockchain increases the difficulty to tamper with the information.

The technology alternatives and security features are impressive but can be daunting, prompting institutions and organizations to turn to service providers as a quick way to enter the space. Athabasca University's PowerED™ is a platform which integrates some in-house development and vendor solutions into a system featuring an online eCommerce component, an LMS, a courseware development environment and digital credential system. There are open source alternatives for elements in this type of platform, allowing organizations to vary the degree of proprietary systems and vendor engagement, if they so choose. More common security features and approaches are likely to be employed before more elaborate technologies such as Blockchain.

MICRO-CREDENTIAL TRENDS ANALYSIS

A scan of online news articles dating back to November 2019 was conducted as part of this project. The scan included the *Academica Top Ten* archive, as well as general internet news queries related to micro-credentials. Five broad trends were revealed:

- Increasing utilization of common micro-credentials
- Increasing recognition and laddering of micro-credentials
- Development of micro-credential frameworks
- Micro-credentials as an increasingly popular way to deliver in-demand or emergency skills
- Increasing number of micro-credentials being offered at PSE institutions in Canada

While these trends are not exhaustive, they account for a large share of recent developments in the area of micro-credentials. Although the primary focus of this trends scan was the Canadian micro-credentialing landscape, some trends from elsewhere in the world are presented as well.

Increasing utilization of common micro-credentials

Many institutions in Canada have partnered with third-party providers to increase their course offerings and offer micro-credentials at the same time. Some of the larger players in this space include ed2go, Acclaim, and Badgr (ed2go, n.d.). These companies structure and deliver micro-credentials slightly differently but are moving into the space and beginning to form partnerships with PSE institutions. Great Plains College in Saskatchewan has recently partnered with The Learning Network (LERN) and ed2go (Great Plains College, n.d.). Courses taken on these platforms can be counted towards certain requirements at Great Plains College, and many come with certifications attached. Registration is done on the ed2go website, although there is a Great Plains College banner. Alberta institutions that are on the ed2go platform include Keyano College, Medicine Hat College, Lakeland College, Olds College, Northern Lakes College, Grande Prairie Regional College, Lethbridge College, and NorQuest College (ed2go, n.d.).

In a similar example of private-public partnership, but in a slightly different vein, Vancouver Community College recently started delivering a Microsoft Office exam resulting in a Certiport credential (Vancouver Community College, n.d.).

In Australia, the telecommunications company Telstra recently partnered with the University of New South Wales to offer two new micro-credentials related to cybersecurity: Security Fundamentals and Secure Code (Telstra, n.d.). The company Edalex launched Credentialate in 2019 out of Australia, which purports to be the world's first "credential evidence platform." Credentialate is a tool which integrates with learning management systems to determine learners' levels of competency in a variety of areas. These competencies are then validated and turned into Badgr credentials.

Increasing recognition and laddering of micro-credentials

A number of institutions in Canada have partnered with OERu, an online course platform. In June 2020, Thompson Rivers University (Kamloops, BC) announced a partnership with OERu that would also allow the potential for laddering opportunities: "Thompson Rivers University (TRU) is the first in North America to offer an international credential transfer based on open educational resources that are available free online. It is also among the first in the world to recognize micro-credit transfer toward a university-level qualification," (Thompson Rivers Uuniversity, 2020). Athabasca University, Kwantlen Polytechnic, and Ryerson's School of Continuing Studies are also listed as partners on OERu's website. BCCampus, a publicly funded organization in the postsecondary sector that works largely in the information technology space, is also listed as a partner (OERu, n.d.).

In 2019, the University of Calgary Faculty of Nursing began offering a stackable Certificate Master of Nursing program, wherein students may complete a series of 1-year part-time certificates in topics related to nursing. They can then continue by completing a series of research credits to earn a Master of Nursing degree (University of Calgary, n.d.).

Development of a micro-credential framework

In Ontario, eCampusOntario represents the first concerted effort by a provincial government to centralize and regulate micro-credentials. According to the eCampusOntario website, "In Summer 2019, eCampusOntario formed a working group to co-create micro-credential initiatives and establish a common currency. Working group members from across sectors developed a framework to build connections between postsecondary institutions and the Ontario workforce. The results are captured in the Principles and Framework document. This document is intended as a high-level guide for micro-credentials in the province so that unique regional initiatives align to a common provincial framework." (eCampusOntario, n.d.). This arrangement was further strengthened by funding in Ontario's recent budget, which allocated $59.5 million over three years to a micro-credentialling strategy (Colleges Ontario, n.d.).

The European Union recognizes the importance of micro-credentials and is working to ensure that micro-credentials are recognized and certified across the European Higher Education Area (European Higher Education Area, 2020). MicroHE is a current EU-funded project looking to "provide the most comprehensive policy analysis yet conducted of the impact of modularisation, unbundling and micro-credentialing in European Higher Education" (MicroHE, n.d.), while a concurrent project, MICROBOL, has the more specific goal of "[supporting] ministries and stakeholders in exploring, within the Bologna Process, whether and how the existing Bologna tools can be used and/or need to be adapted to be applicable to micro-credentials," (MicroHE, n.d.). Both of these initiatives represent a commitment to large-scale standardization and implementation of micro-credentials across the European Higher Education Area.

In December 2020, the European Commission released a report entitled "A European Approach to Micro-Credentials" (European Commission, 2020), that detailed a framework for micro-credentials as well as a roadmap for the next several years, including steps related to definitions and standardization, national alignment, quality assurance, recognition, and storage and portability.

In New Zealand, the New Zealand Qualification Authority (NZQA), the body tasked with quality assurance in higher education, lists all approved micro-credentials in the country on its website (New Zealand Qualifications Authority, n.d.). Starting in August 2018, any teaching organization in New Zealand may apply to have a micro-credential approved by this central authority (NZQA, n.d.).

Micro-credentials as an increasingly popular way to deliver in-demand or emergency skills

In Ontario, the Rapid Skills program (Government of Ontario, n.d.) resulted in new micro-credentials at Sheridan College (Sheridan College, n.d.) and Georgian College (Georgian College, n.d.). The program was aimed at upskilling current automotive and advanced manufacturing workers.

A more specific version of this comes from Red River College in Manitoba, who in fall 2020 started offering a COVID-19 nasal swab micro-credential, in partnership with the Province of Manitoba (Government of Manitoba, n.d.). According to the news release, this could allow workers with some healthcare experience to be certified as workers in COVID-19 testing centres.

Both of these recent Canadian examples highlight how micro-credentials, more than other types of higher education credentials, can be used to urgently address skills gaps.

Increasing number of micro-credentials being offered at PSE institutions in Canada

Announcements around new micro-credential programs are ubiquitous in recent Canadian higher education news. New micro-credential offerings cover a wide variety of disciplines, among them Education, Health Care, IT, Manufacturing, and Business. There is a slight bias towards technology skills and business skills, and programs typically focus on fields where it is anticipated that there is a significant population of individuals with fundamental abilities who could benefit from some very specific skills to meet employer demands. For example, programming languages (for those with an IT or computer science background), specific community or population certifications (for current teachers or early learning instructors), or specific aspects of advanced manufacturing (for those with manufacturing experience).

Bow Valley College has established the Pivot-Ed model in which participants take an AI-based assessment to demonstrate certain skills and receive a micro-credential upon completion. If unsuccessful in the assessment, the gaps in knowledge are identified and learners can obtain training specific to those gaps (Bow Valley College, n.d.). A specific example lies in a recent partnership with Ametros Learning that took this model and focused on managers and their ability to lead teams remotely (Ametros Learning Inc, n.d.).

MICRO-CREDENTIAL PROGRAM OFFERINGS IN ALBERTA

Many institutions in Alberta's higher education system currently offer micro-credentials. They vary greatly with regard to topics, cost, and time commitment. Some can be completed online in a matter of hours at minimal cost, while others may take up to a year to complete and involve multiple courses and several thousand dollars in tuition fees. Although they vary, several common themes emerged upon looking closely at these offerings.

- Micro-credential programs in Alberta touch on a wide variety of disciplines, though there is a slight bias towards business and information technology courses. Business courses tend to have a focus on leadership and project management, while the content of IT-related courses is quite broad, including topics such as programming languages, cybersecurity, and specific software. This may be a combination of demand for these topics in the micro-credential format, as well as the ease with which they can be taught online.

- Almost all micro-credential courses offered in Alberta are offered online to some degree. Many offer the option of online or face-to-face instruction, while others are delivered in a hybrid manner.

- Costs vary for micro-credentials in Alberta. Those that can be completed within hours online cost only $100. The majority, though, are offered over one or two days or equivalent, of instruction and cost $200-$500 per day.

- Where digital badges are offered, institutions in Alberta seem to be split between the Badgr and Acclaim platforms for credential registries.

  Note: *In compiling this overview of micro-credential offerings at Alberta institutions, a broad definition of micro-credential was used, and therefore not all of the programs referenced here are specifically referred to as "micro-credentials." Many of the programs detailed here are in fact referred to as certificates, but due to their abbreviated nature they were deemed of interest for the purposes of this report.*

Comprehensive Academic and Research Universities (CARU)

Among the comprehensive academic and research universities, Athabasca University and the University of Calgary have the greatest number of offerings. The University of Lethbridge does not advertise any micro-credentials.

- Athabasca University offers a variety of micro-credentials in leadership, project management, digital transformation, accessibility, and artificial intelligence. The majority of courses offered are in leadership training. Individual courses generally range from 20-30 hours at a cost of $720-$1200. Certain combinations of four courses can be stacked to form a certificate.

- The University of Alberta does not market any micro-credentials to non-students. The one micro-credential found there is called the "Community Service Learning Certificate," and is essentially a co-curricular record-type offering. It consists of a number of courses over the course of a student's undergraduate degree.

- Of the CARU institutions, the University of Calgary offers the most comprehensive slate of micro-credential offerings. They cover a broad spectrum of content, with a focus on technology and software. They are tiered, with offerings at Level 1, Level 2, and Level 3. These comprise approximately 0-5 hours, 5-10 hours, and 10-15 hours of course content, respectively. The University of Calgary has partnered with Badgr for these micro-credentials.

Undergraduate Universities (UU)

Alberta University of the Arts is the only undergraduate university to specifically market micro-credentials. MacEwan University does not specifically market micro-credentials, despite having some similar offerings. Mount Royal University does not offer any micro-credentials.

- Alberta University of the Arts offers four micro-credential programs ("mini-certificates"), covering several specialized topics in art & business: arts funding, arts marketing, finance for arts business, and arts management. They each cost $2200 and comprise 135 hours of class time (both face-to-face and online).

- MacEwan University does not advertise any micro-credentials, as such, but does offer a number of short program offerings through the school of continuing studies. They are typically in the $200-500 per 10 hours of course content range, and mostly range from 40 to 100 hours (or 4 to 8 courses). They are normally offered in a combination of face-to-face and online formats (course-dependent) but are currently offered entirely online.

Comprehensive Community Colleges (CCC)

About half of Alberta's colleges offer some form of micro-credentials.

- Bow Valley College offers 2 micro-credential courses in partnership with Acclaim: Client Problem Solving and IBM Business Intelligence Analyst. The latter costs $979 and comprises 36 hours of course time.

- Grande Prairie Regional College, similar to MacEwan University, does not advertise any micro-credentials, but does offer a wide variety of short, credentialed programs through its continuing education department. These cover a broad spectrum of subject areas, with a focus on business and technology-related topics. Most are between 40 and 100 hours, costing $300-$400 per 10 hours of course time.

- Lethbridge College offers approximately 11 micro-credentials, focused on corporate clients. They are also focused on basic business skills such as Microsoft programs (i.e., Office) and soft skills such as communication and teamwork. Each course costs $300-$400 and consists of 8-14 hours of workshop time over 1-4 sessions. Badgr is the credential platform used.

- NorQuest College uses the Acclaim platform to attach credentials to 16 courses currently offered at the college, with a focus on workplace leadership but also including courses on hemp production and flight attendant. They mostly range from 4-15 hours of course time, at a cost of $300-$700.

- Although it does not advertise them as "micro-credentials," Northern Lakes College offers eight short certificate programs, covering a variety of topics. These consist of 5-9 courses and cost $400-$500 per course.

- Red Deer College, similar to other institutions, does not advertise micro-credentials although short, credentialed programs are offered through the school of continuing studies. They are typically $300-$400 per 10 hours of course time. Notably, a recently added credential entitled "Strategic Success for Businesses during COVID-19," costing $100 for a 1-hour course.

Independent Academic Institutions (IAI)

Among independent academic institutions, St. Mary's University is the only institution to offer micro-credentials that are consistent with the project working definition, through its Agile training program. Offerings at Burman University and The King's University are more akin to co-curricular records.

- Burman University offers several co-curricular certificates, ranging from 30 credits to 39 credits, which involve undergraduate students taking courses alongside their major. They are similar to minors.

- The King's University also offers a co-curricular certificate, the "Micah Certificate in Justice and Development," which is in many ways like a minor. It is intended for undergraduate students to complete alongside their major.

- St. Mary's University offers a slate of Agile training courses which are certified and badged by the International Consortium for Agile (ICAgile). They are almost all $900, 2-day online courses.

Polytechnic Institutions (PI)

Although both polytechnic institutions have offerings, only NAIT markets these as micro-credentials.

- NAIT offers 11 micro-credentials, certified via Acclaim. They all consist of 14 hours of class time, are delivered online, and cost $558. They mostly cover topics related to project management.

- SAIT does not advertise micro-credentials, but offers a wide variety of short, credentialled programs (certificate of achievement or statement of completion). These consist of anywhere from 2 to 10 college courses.

LABOUR MARKET ANALYSIS

The labour market analysis presented here is intended to complement other sections of this report for context on the current state of the labour market in northern Alberta, especially around the specific job skills that are being mentioned by employers in online job postings.

First a general overview is presented, followed by a more detailed analysis of available job postings data. The final section consists of a detailed skills demand analysis for occupations anticipated to be in demand in northern Alberta over the next several years.

Methodology

Detailed labour market information was obtained from two main sources: the 2016 Canadian census and Burning Glass' Labor Insight™ tool. The 2016 census was used due to the ability to access data at the 4-digit National Occupational Classification (NOC) level as well as at the census division level. This makes it possible to target specific occupations in the Northern Alberta Development Council's (NADC) mandate area. However, when examining data from Statistics Canada, the geographical frame of reference for northern Alberta includes six census divisions: 12, 13, 16, 17, 18, and 19. In reality, only portions of census divisions 12 and 13 are part of the NADC region, but the required census data is not available at geographical levels lower than this.

Labor Insight™, a tool from Burning Glass Technologies, is made up of current and historical job postings collected from over 40,000 online job sites worldwide, resulting in a comprehensive real-time portrait of labour market demand. This software uses patented technology, based on advanced natural language analytics, to mine and code detailed data from each posting describing the specific skills, education, and experience required for the job. Labor Insight™ provides researchers with two strong advantages over traditional labour market data sources: first, the data is compiled in real-time, allowing for timely analysis in quickly-evolving labour markets; secondly, in addition to standard industry codes (National Occupation Codes, North American Industry Classification System, etc.), all aspects of the indexed job postings—including industry, employer, occupation, location, skills, education, salary, and job title—are compiled using natural language analytics, enabling labour market researchers to paint the clearest possible picture of what jobs are in demand, where they are located, and what skills and qualifications they require. Within Labor Insight™ a custom geographic region was built that aligns precisely with NADC's definition of northern Alberta.

Demographic Overview

The 2019 July 1st population estimate for the economic regions (ERs) of northern Alberta was 426,898 (Statistics Canada, n.d.-e). This is still less than the region's high population of 429,138 in 2014, although the population has been growing modestly in both economic regions since 2017. Annual population estimates are shown below in Figure 1, while annual population growth rates are illustrated subsequently in Figure 2.

Figure 1. Annual population estimates for northern Alberta ERs, 2010-2019 (Statistics Canada, n.d.-e)
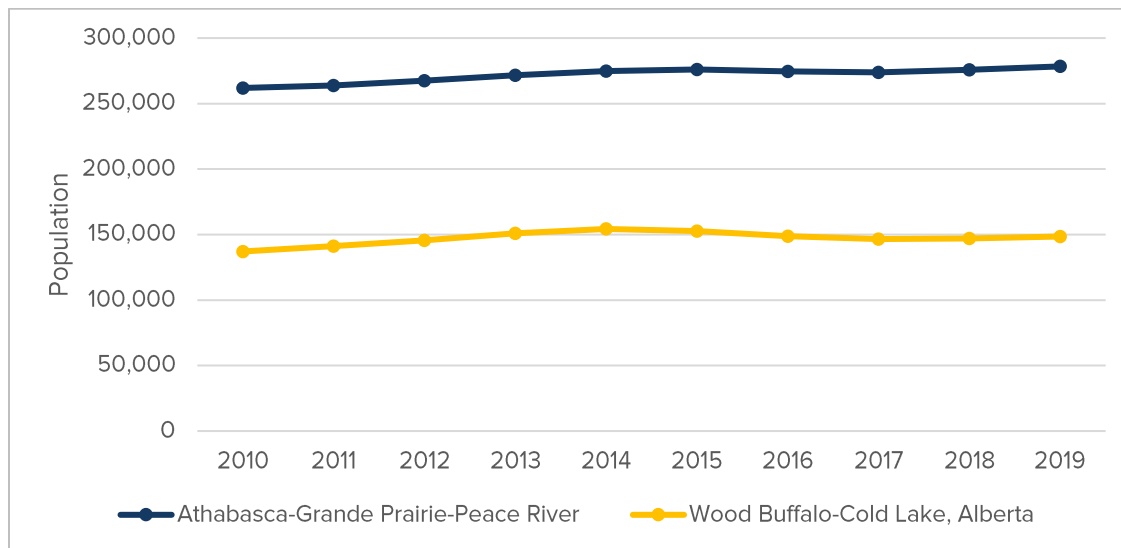
Figure 2. Annual population growth rates for northern Alberta ERs, 2010-2019 (Statistics Canada, n.d.-e)
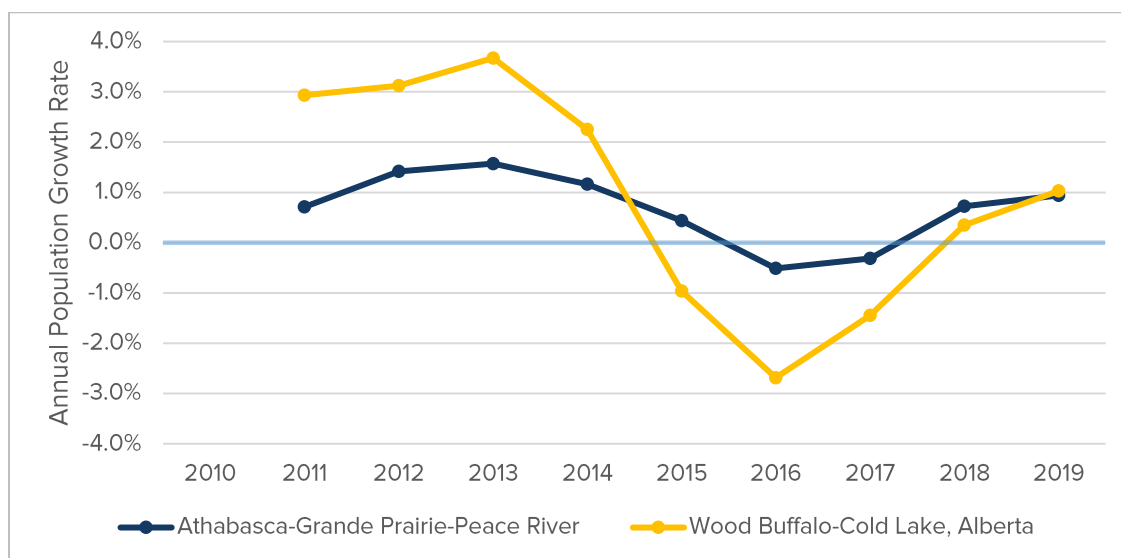
The population in northern Alberta is skewed slightly younger than the rest of Alberta, with 28% of the population under 20, compared to 25%. The population between 20 and 39 is similar to the rest of Alberta, while the share of those 40 and over is lower in northern Alberta (Statistics Canada, n.d.-a).

Figure 3. Population distribution for northern Alberta compared to the rest of Alberta, 2016 Canadian Census (Statistics Canada, n.d.-a)
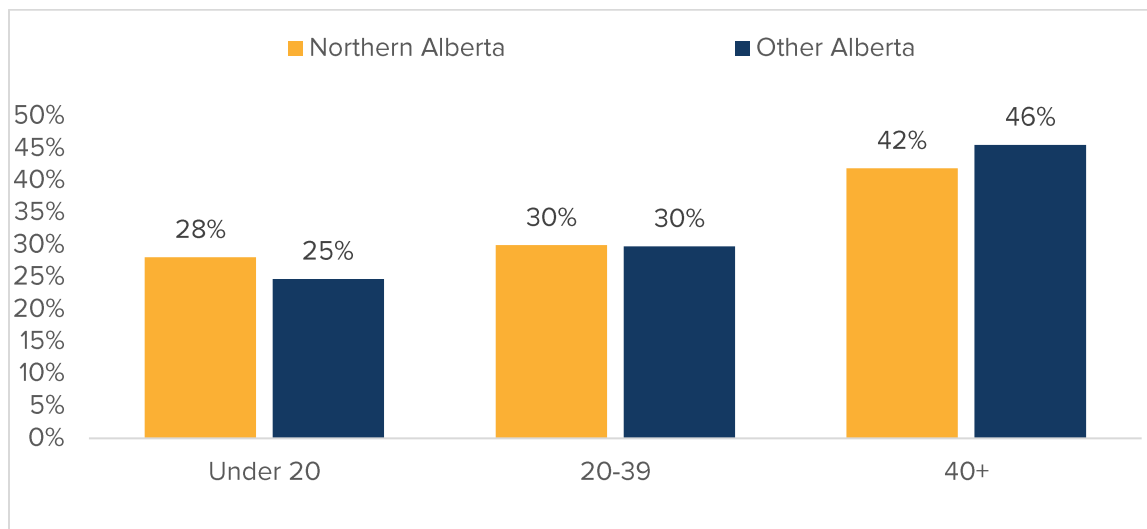
Unemployment in northern Alberta has tended to fluctuate with national and provincial averages (Figure 4), with both regions experiencing periods of higher unemployment than these benchmarks as well as periods with lower unemployment (Statistics Canada, n.d.-c). Due to the nature of Statistics Canada's reporting, Banff-Jasper-Rocky Mountain House is included with Athabasca-Grande Prairie-Peace River in this figure. Note that there is a data gap for Wood Buffalo-Cold Lake from June 2016 to September 2016 due to the Fort McMurray wildfire in that year.

Figure 4. Unemployment Rate (monthly estimate) for northern Alberta Economic Regions, 2015-2020 (Statistics Canada, n.d.-c)
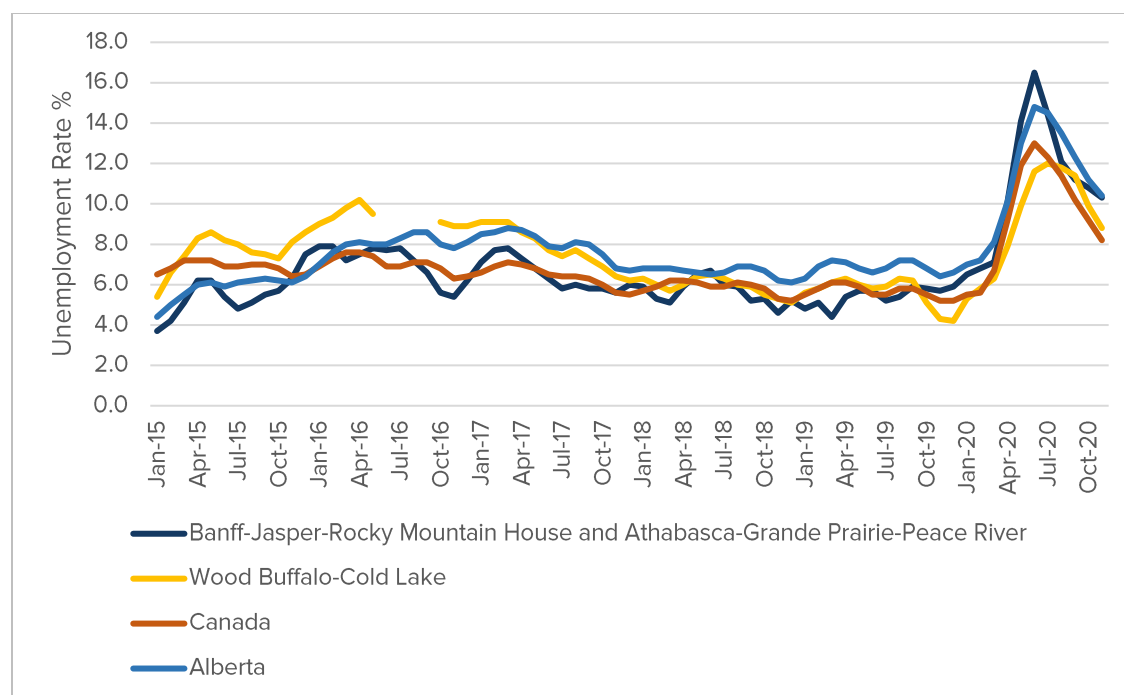
Note: *Due to the nature of Statistics Canada's reporting, Banff–Jasper–Rocky Mountain House is included with Athabasca–Grande Prairie–Peace River in this figure. Note that there is a data gap for Wood Buffalo-Cold Lake from June 2016 to September 2016 due to the Fort McMurray wildfire in that year.*

The most common occupational groups in northern Alberta, as classified by the National Occupational Classification (NOC) system, according to the 2016 Canadian census, were transport truck drivers, managers in agriculture, heavy equipment operators, and retail salespersons as shown in Table 1 (Statistics Canada, n.d.-b).

Table 1. Top 25 4-Digit NOC Categories in northern Alberta by Size of Labour Force, 2016 Census and Labor Insight™ (Statistics Canada, n.d.-b)

NOC Code	NOC Title	Employed	Unemployed	Total Labour Force	Unemployment Rate	Online Job Postings (Past 12 months)
7511	Transport truck drivers	7260	1300	8560	15.2%	268
0821	Managers in agriculture	7165	75	7240	1.0%	-
7521	Heavy equipment operators (except crane)	5875	1190	7065	16.8%	58

NOC Code	NOC Title	Employed	Unemployed	Total Labour Force	Unemployment Rate	Online Job Postings (Past 12 months)
6421	Retail salespersons	5990	510	6500	7.8%	401
0621	Retail and wholesale trade managers	4715	195	4910	4.0%	-
6733	Janitors, caretakers and building superintendents	3860	430	4290	10.0%	282
6611	Cashiers	3470	350	3820	9.2%	131
1221	Administrative officers	3390	210	3600	5.8%	-
7611	Construction trades helpers and labourers	2775	815	3590	22.7%	86
6711	Food counter attendants, kitchen helpers and related support occupations	3085	365	3450	10.6%	112
4032	Elementary school and kindergarten teachers	3345	85	3430	2.5%	14
9232	Central control and process operators, petroleum, gas and chemical processing	3205	135	3340	4.0%	-
8431	General farm workers	3020	185	3205	5.8%	5
7321	Automotive service technicians, truck and bus mechanics and mechanical repairers	2930	240	3170	7.6%	200
1411	General office support workers	2925	200	3125	6.4%	99
1241	Administrative assistants	2865	155	3020	5.1%	183
6731	Light duty cleaners	2500	335	2835	11.8%	-

NOC Code	NOC Title	Employed	Unemployed	Total Labour Force	Unemployment Rate	Online Job Postings (Past 12 months)
8222	Contractors and supervisors, oil and gas drilling and services	2455	375	2830	13.3%	-
1311	Accounting technicians and bookkeepers	2700	130	2830	4.6%	80
6322	Cooks	2390	265	2655	10.0%	444
3012	Registered nurses and registered psychiatric nurses	2605	50	2655	1.9%	125
7237	Welders and related machine operators	2120	520	2640	19.7%	29
7312	Heavy-duty equipment mechanics	2370	145	2515	5.8%	107
7271	Carpenters	2075	410	2485	16.5%	27
4413	Elementary and secondary school teacher assistants	2325	115	2440	4.7%	4
All occupations	Overall Total (including NOCs not listed here)	203565	19220	222785	8.6%	10,315

Time-series data is not available for the northern Alberta region, specifically at the 4-digit NOC code level, but it is available at the 2-digit level through Statistics Canada's Labour Force Survey (Statistics Canada, n.d.-d). The year-over-year trend for the top 20 2-digit NOC groupings by employment in 2020 are shown in Table 2 below. Data is shown for both of northern Alberta's economic regions and, due to Statistics Canada's reporting conventions, Banff – Jasper – Rocky Mountain House is included as well.

Table 2. Yearly Employment by 2-digit NOC, for Athabasca - Grande Prairie - Peace River, Wood Buffalo - Cold Lake, and Banff - Jasper - Rocky Mountain House, 2016-2020 (Statistics Canada, n.d.-d)

	2016	2017	2018	2019	2020
Maintenance and equipment operation trades (73)	19	16.7	19	20.6	17.3
Middle management occupations in trades, transportation, production and utilities (07-09)	12.1	14.2	12.7	14.2	16.9
Transport and heavy equipment operation and related maintenance occupations (75)	17.5	18.1	20.5	18.9	14.7
Supervisors and technical occupations in natural resources, agriculture and related production (82)	12.6	16	17.6	16.1	13.3
Industrial, electrical and construction trades (72)	15.4	20.7	16.3	16.5	13
Service support and other service occupations, n.e.c. (67)	14.8	12.5	13.4	12.5	12.7
Technical occupations related to natural and applied sciences (22)	6.6	6.9	10.2	9.3	10.3
Administrative and financial supervisors and administrative occupations (Total)	12.1	10.6	10.9	11.5	9.1
Retail sales supervisors and specialized sales occupations (62)	7	7.1	8.1	7	9.1
Office support occupations (14)	10.5	9.1	10	8.7	8.8
Service supervisors and specialized service occupations (63)	10.9	9	6.9	8.6	7.6
Professional occupations in education services (40)	7.8	6.7	7.9	7.3	7.5
Service representatives and other customer and personal services occupations (65)	7.5	6.8	8.5	9.6	7.1
Sales support occupations (66)	9.5	7.2	6.6	6.7	6.7
Sales representatives and salespersons - wholesale and retail trade (64)	7.3	6.9	6.6	10.2	6.6
Professional occupations in natural and applied sciences (21)	4.4	5	5.5	6	6.3
Middle management occupations in retail and wholesale trade and customer services (06)	6.7	7.3	6.6*	5.9*	6.1
Processing, manufacturing and utilities supervisors and central control operators (92)	5.9	7	6.5	7.9	6
Professional occupations in law and social, community and government services (41)	1.9*	2.3*	2.7*	2.8*	4.7
Professional occupations in business and finance (11)	3.7	2.8*	4.3	4.4	4.4*

Notes: Values expressed in thousands.
  *An asterisk indicates where data from one region is missing due to low-value suppression.

Job Posting Analysis

A job posting analysis was conducted using the Labor Insight™ database from Burning Glass Technologies. Querying results for northern Alberta specifically yielded 10,315 job postings for the most recent 12-month period available, December 2019 to November 2020. For more detailed information on Labor Insight™, please refer to the methodology section above. In the December 2019 to November 2020 period, the majority of job postings in northern Alberta were in the Regional Municipality of Wood Buffalo, followed by Grande Prairie. Cold Lake and Slave Lake also accounted for a significant number of observed job postings.

Figure 5. Location of Job Postings in northern Alberta, Dec. 2019 to Nov. 2020, Labor Insight™
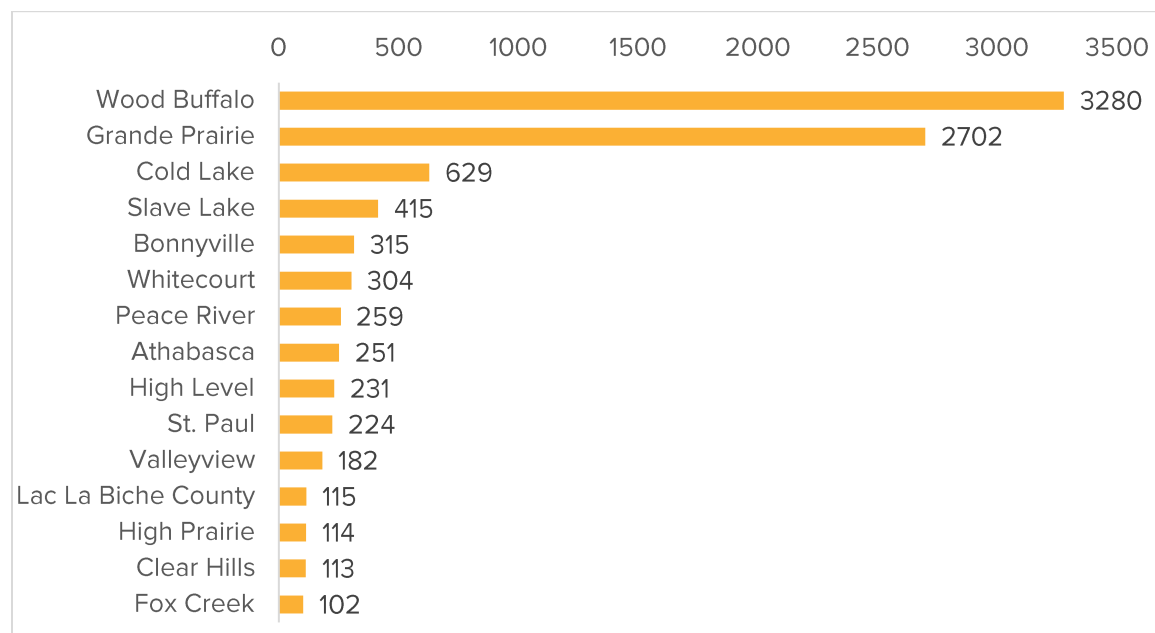
The most common NOC code grouping for job postings in northern Alberta between December 2019 and November 2020 was food service supervisors (6311), followed by retail sales supervisors (6211), cooks (6322), and retail salespersons (6421). The top 25 are shown in Figure 6 below.

Figure 6. NOC Occupation Groupings of Job Postings in northern Alberta, Dec. 2019 to Nov. 2020, Labor Insight™

Occupation	Value
Food service supervisors (6311)	543
Retail sales supervisors (6211)	491
Cooks (6322)	444
Retail salespersons (6421)	401
Janitors, caretakers and building superintendents (6733)	282
Transport truck drivers (7511)	268
Sales and account representatives - wholesale trade (non-technical) (6411)	235
Delivery and courier service drivers (7514)	222
Home support workers, housekeepers and related occupations (4412)	209
Automotive service technicians, truck and bus mechanics and mechanical repairers (7321)	200
Other customer and information services representatives (6552)	185
Administrative assistants (1241)	183
Security guards and related security service occupations (6541)	179
Other business services managers (0125)	174
Material handlers (7452)	156
Cashiers (6611)	131
Food and beverage servers (6513)	126
Registered nurses and registered psychiatric nurses (3012)	125
Other labourers in processing, manufacturing and utilities (9619)	116
Food counter attendants, kitchen helpers and related support occupations (6711)	112
Heavy-duty equipment mechanics (7312)	107
Restaurant and food service managers (0631)	102
General office support workers (1411)	99
Hotel front desk clerks (6525)	95
Human resources professionals (1121)	93

Figure 7 below details the top 25 most commonly mentioned skills in northern Alberta job postings between December 2019 and November 2020, the most recent 12 months available at the time of writing.

Figure 7. Top 25 most common skills mentioned in online job postings in northern Alberta, Dec. 2019 to Nov. 2020, Labor Insight™

% of job postings mentioning skill

Skill	%
Scheduling	18%
Repair	17%
Customer Service	16%
Sales	11%
Quality Assurance and Control	8%
Inventory Maintenance	8%
Retail Industry Knowledge	7%
Cleaning	7%
Staff Management	7%
Budgeting	7%
Merchandising	6%
Record Keeping	6%
Food Service Experience	5%
Customer Contact	5%
Administrative Support	4%
Machinery	3%
Cooking	3%
Data Entry	3%
Project Management	3%
Cardiopulmonary Resuscitation (CPR)	3%
SAP	3%
Teaching	3%
Lifting Ability	3%
Accounting	3%
Predictive / Preventative Maintenance	3%

Table 3 below shows the percentage of online job postings in northern Alberta which mentioned select skills from 2015 to 2020. The skill cluster families presented are categorized by Labor Insight™, and include Administration, Business, Sales, Customer and Client Support, Other, Supply Chain and Logistics, Finance, Health Care, and Information Technology. These would reflect the skills most sought by employers in northern Alberta when looking for external hires.

Table 3. Percentage of northern Alberta online job postings mentioning select skills, 2015–2020, Labor Insight™

Skill Cluster Family	Skill	2015	2016	2017	2018	2019	2020
Administration	Scheduling	12%	14%	14%	16%	16%	18%
	Record Keeping	5%	5%	5%	5%	5%	6%
	Administrative Support	2%	3%	3%	4%	3%	4%
	Data Entry	2%	3%	4%	3%	3%	3%
	Manual Dexterity	2%	2%	2%	2%	2%	2%
	Administrative Functions	1%	1%	1%	2%	1%	2%
	Appointment Setting	1%	1%	2%	1%	1%	1%
	Sorting	1%	1%	1%	1%	1%	1%
Business	Quality Assurance and Control	6%	7%	7%	7%	7%	8%
	Staff Management	7%	7%	6%	5%	6%	7%
	Project Management	4%	3%	4%	4%	4%	3%
	Supervisory Skills	5%	3%	3%	2%	2%	2%
	Business Administration	1%	1%	1%	2%	2%	2%
	Conflict Management	2%	3%	2%	2%	1%	2%
	Cost Control	2%	2%	2%	2%	2%	2%
	Performance Appraisals	1%	1%	1%	1%	1%	1%
	Performance Analysis	1%	1%	1%	1%	1%	1%
	Key Performance Indicators (KPIs)	1%	2%	2%	2%	2%	1%
	Operations Management	2%	1%	2%	1%	1%	1%
	Performance Management	1%	2%	2%	2%	1%	1%
Sales	Sales	13%	14%	13%	10%	11%	11%
	Merchandising	5%	5%	3%	3%	5%	6%
	Sales Goals	2%	3%	3%	3%	3%	2%
	Product Sales	2%	2%	2%	2%	3%	2%
	Retail Sales	2%	2%	1%	1%	2%	2%
	Product Knowledge	1%	2%	2%	1%	2%	2%
	Business Development	2%	3%	3%	2%	2%	1%
	Sales Management	1%	2%	1%	1%	2%	1%
	Prospective Clients	1%	1%	1%	1%	1%	1%
Customer and Client Support	Customer Service	15%	17%	16%	15%	16%	16%
	Customer Contact	4%	5%	5%	4%	4%	5%
	Customer Checkout	1%	1%	1%	1%	1%	2%
	Point of Sale System	1%	1%	1%	1%	1%	1%
	Cash Handling	1%	1%	1%	1%	1%	1%
	Cash Register Operation	2%	2%	1%	1%	1%	1%
Other	Repair	17%	17%	20%	19%	18%	17%
	Cleaning	9%	9%	7%	6%	7%	7%

Skill Cluster Family	Skill	2015	2016	2017	2018	2019	2020
	Quality Management	1%	1%	1%	1%	1%	1%
	Commissioning	1%	2%	2%	2%	1%	1%
Supply Chain and Logistics	Inventory Maintenance	3%	5%	4%	4%	6%	8%
	Post Trip Inspections	1%	3%	2%	2%	2%	2%
	Forklift Operation	2%	2%	3%	3%	2%	2%
	Inventory Management	2%	2%	2%	1%	2%	2%
	Inventory Control	3%	2%	2%	1%	2%	2%
	Store Management	2%	2%	2%	1%	2%	2%
	Store Operations	#N/A	1%	1%	2%	2%	1%
	Procurement	1%	1%	2%	3%	2%	1%
	Shipping and Receiving	1%	1%	1%	1%	1%	1%
Finance	Budgeting	9%	7%	8%	8%	8%	7%
	Accounting	3%	2%	2%	3%	2%	3%
	Customer Billing	1%	1%	1%	2%	1%	1%
	Invoicing	1%	1%	1%	1%	1%	1%
Health Care	Cardiopulmonary Resuscitation (CPR)	3%	3%	4%	3%	4%	3%
	Lifting Ability	2%	3%	2%	2%	3%	3%
	Patient Care	1%	2%	2%	#N/A	1%	2%
	Allergies	1%	1%	1%	1%	1%	1%
	Life Support	#N/A	2%	1%	#N/A	1%	1%
	Heavy Lifting	1%	1%	1%	1%	1%	1%
Information Technology	SAP[2]	2%	4%	3%	7%	4%	3%
	Technical Support	1%	1%	2%	2%	2%	1%
	Spreadsheets	3%	2%	2%	2%	1%	1%
	Telecommunications	1%	1%	1%	1%	2%	1%

Looking Ahead

Every three years, the Alberta government produces regional occupational forecasts for each of the Economic Regions of Alberta. Athabasca-Grande Prairie-Peace River is combined with Banff-Jasper-Rocky Mountain House due to their smaller population. Unlike many other government projections, due to sample size limitations at the regional level, these are done at the 3-digit NOC level. Some of the NOC groupings projected to grow the most over the period 2018-2023 are presented below.

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[2] SAP is an enterprise software used to manage business operations and customer relations.

Table 4. High-growth 3-digit NOC groupings for Wood Buffalo - Cold Lake, Alberta Regional Outlook Forecast 2018-2023

3-digit NOC	3-digit NOC Title	Avg. Annual Growth	2018 employment	Projected 2023 employment
121	Administrative services supervisors	6.7%	300	400
225	Technical occupations in architecture, drafting, surveying, geomatics and meteorology	5.0%	400	500
311	Physicians, dentists and veterinarians	6.7%	300	400
654	Security guards and related security service occupations	6.7%	300	400
728	Masonry and plastering trades	5.0%	400	500
737	Crane operators, drillers and blasters	10.0%	200	300
921	Supervisors, processing and manufacturing occupations	4.0%	500	600
Overall		1.1%		

Table 5. High-growth 3-digit NOC groupings for Athabasca - Grande Prairie - Peace River*, Alberta Regional Outlook Forecast 2018-2023

3-digit NOC	3-digit NOC Title	Avg. Annual Growth	2018 employment	Projected 2023 employment
223	Technical occupations in civil, mechanical and industrial engineering	2.0%	1000	1100
311	Physicians, dentists and veterinarians	3.8%	1000	1200
312	Optometrists, chiropractors and other health diagnosing and treating professionals	10.0%	200	300
322	Technical occupations in dental health care	2.9%	700	800
728	Masonry and plastering trades	2.5%	800	900
744	Other installers, repairers and servicers	2.2%	900	1000
Overall		0.0%		

*Note: Includes Banff - Jasper - Rocky Mountain House

For each of these NOCs (except for NOC 322 due to insufficient data), tables are presented in Appendix B for the most mentioned skills in those job postings in 2020, and the frequency of those skills going back to 2015.

Conclusions

The job posting data and future growth data provide valuable context on the regional employment and skills requirements, with traditional occupations driving employment opportunities. The continued monitoring of the job posting information would also allow the identification of emerging occupations or skill requirements in the region. The skills requirements and demand for occupations may change quickly due to technological or environmental changes; recent increased demand for delivery drivers due to online shopping would be an example. The job posting data does allow identification of skills that applicants require, but not necessarily the skills gaps that would drive demand for training. On-going engagement with employers would allow identification of these skill gaps between job postings and applicant pools. The same employer engagement could also allow the identification of changes to job skill requirements for existing employees, which may not be reflected in job postings.

There does exist a set of broader skills, such as supervisory skills, digital competency, or health and safety, which cross over different types of occupations. The potential to have common micro-credentials which are applicable across multiple occupations could be assessed through engagement with employers and could make the delivery more feasible for institutions.

STAKEHOLDER INTERVIEWS

Stakeholder interviews were conducted with representatives from postsecondary institutions, employers, and industry associations in northern Alberta. Interviews focussed on representatives from northern Alberta's key industries including healthcare, oil and gas, forestry, the public sector, and construction. A list of relevant contacts was developed by both the LEARN team and Academica. Representatives were contacted via email with follow-up communications to non-respondents. A semi-structured interview guide was developed for each group (i.e., one each for institutional representatives and employers/industry associations) and sent to representatives prior to their scheduled interviews.

Interviews were conducted via teleconference or using Microsoft Teams. Interviews began December 14, 2020 and were completed February 4, 2021. In total, 15 interviews were conducted, each approximately 30 minutes in length. Interviews were recorded with permission and transcribed. A qualitative content analysis was conducted using the transcripts in order to uncover themes related to micro-credentials and their relevance, value and perceptions among the stakeholder groups.

Table 6: Interviews Conducted

Organization	Sector	Location
Athabasca University	PSE	Athabasca
Grande Prairie Regional College	PSE	Grande Prairie
Keyano College	PSE	Fort McMurray
Keyano College	PSE	Fort McMurray
Portage College	PSE	Lac La Biche
Northeastern Alberta Aboriginal Business Association	Business Services	Fort McMurray
Women Building Futures*	Construction	Edmonton
Akron Engineering	Engineering Services	Fort McMurray
Alberta Forest Products Association*	Forestry	Edmonton
Alberta Health Services	Health Care	Fort McMurray
Plains Midstream*	Oil and Gas	Calgary
Stepping Stone Community Daycare Society	Other services	Grande Prairie
Alberta Newsprint	Paper Mill	Whitecourt
Grande Prairie & District Chamber of Commerce	Public sector	Grande Prairie
Canfor	Sawmill	Grande Prairie

*Focus of interview was on northern regions/branches of the sector or organization

Summary of Interview Findings

The interviews addressed several issues around awareness, perceptions, current state, and the future of micro-credentials in northern Alberta. Some themes that emerged related to each of these included:

1. Ambiguity related to awareness and definition of micro-credentials.

2. Uncertainty around the benefits and challenges of offering micro-credentials, stemming from a lack of formal definition or inclusion in a postsecondary framework.

3. Emphasis on ensuring micro-credentials are:

   - developed and executed effectively,

   - not a duplication of resources,

   - built with student success in mind, and

   - directly responsive to employer needs.

Awareness of Micro-credentials

When asked about their awareness of the term micro-credentials, only three industry representatives indicated they had not heard of them. Interestingly, another three stated that while aware of the concept, they were not familiar with the actual term. The remaining four industry representatives were familiar with micro-credentials and defined them in a way that was similar to the working definition used for this project. Among institutions, all representatives had heard the term micro-credentials.

Asking individuals to define the term micro-credentials revealed uncertainty. Words such as "short", "skill" and "competency" were used most frequently, but there was also a lack of confidence in their own definitions. Interviewees noted it was difficult to come up with a definition they knew to be consistent across industry. Representatives from the postsecondary sector had a more comprehensive understanding of the term, while employers and industry associations explained in vague terms.

- *Some type of credential or qualification... something that you might gain over a short course as opposed to a degree or diploma.*

- *I have heard of them... My understanding is more that they're kind of in contrast to a full university degree, they would be kind of mini sections. So, I have a credential in marketing communications, because I took a couple of courses in that, but I don't have a full degree.*

- *I think intuitively I knew what it meant, but I don't think we've thrown around the term yet, no.*

- *My understanding of micro-credential is something that you don't necessarily go to an institution to take. There could be a variety in how it's delivered, but it's a short time span, a short time commitment... Training tidbits that you can get.*

- *An employer can send their employee, maybe it's a two-month commitment, maybe in some cases it's a six-month commitment, but it's not going to be three years before my person gets the skills that they need. It's going to be more bite-sized chunks that can be stackable, but it'll be like a standalone skill rather than the whole degree or diploma. Just smaller, bite-size chunks.*

- *There are so many definitions out there to land on one, but my understanding of a micro-credential is: the qualification or an assessment of skills or competency that is recognised at a modular level. And those modules are stacked together to form a micro-credential.*

- *I understand a micro-credential to be a specific set of competencies. And so, whether that's skills or knowledge or attitudes or a combination of all of them, and it's usually a kind of direct, here's what we're doing. We're going to do it in a shorter period of time, and you can get a micro-credential out of it. And the micro credential ideally could then be used with another micro-credential with a designated pathway into something larger.*

- *To me a micro-credential is a bite-sized learning experience that's specifically tailored to a skill set that's going to be developed through specific content.*

Large employers and industry associations compared micro-credentials to some courses that are provided through their own organizations. These included industry qualifications (e.g., trades "tickets"), professional development opportunities (e.g., leadership training), or employee training (e.g., health and safety). Some partner with an external organization or a postsecondary institution, and others offer training under their own organizational brand. Interviewees that mentioned these examples did not refer to them explicitly as micro-credentials.

- *Inside our company, we have a college, an internal college, and we do a number of different courses that I think would apply to this term. It might be a two- or three-day workshop on leadership, things like that.*

- *We use a particular company that provides leadership training and provides courses, and we check it off as you've attended that course. So, we've kind of done the concept.*

- *We do a lot of competency assessments in-house. I think it's probably more something that we do internally versus looking externally for at this time, but I could certainly see the role that it would play in industry and in the marketplace.*

- *We offer a couple. One of them is on the health and safety side of things and it's mostly like auditor training and that kind of stuff. And then also our lumber grader certificates for people who work in the mills grading lumber.*

As mentioned, employers interviewed seem to be aware that micro-credentials exist, and most agreed that they view them as valuable. However, some expressed concern about broader awareness across industry due to a lack of common language, and a lack of formal structure.

- *I honestly think if institutions are putting out micro-credentials but nobody's talking the same language, it's only going to further confuse industry and employers.*

- *I don't know if people are there yet. Like to really understand what it means that somebody has a micro-credential.*

- *I think it's still, like I said, a buzzword and it's kind of unknown… But I think once the concept is defined and there's some parameters put around it and there's actual recognised micro-credential opportunities. I think the businesses will see the value in that.*

Perceptions of Micro-credentials

Micro-credentials are viewed as valuable across the sectors included in the interviews. The underlying goal of providing individuals with ways to prove or gain competencies was seen as extremely valuable both to learners and employers. Interviewees also highlighted the fact that micro-credentials have particular value in their ability to quickly and effectively respond to industry needs.

- *Fundamentally, I think it is much more practical. That being said … I think that different levels of thinking come out of higher education than small, short courses. I do think it's valuable and I think for a hands-on person from a hands-on perspective, it gives people actual practical knowledge that you can use, but I do think there's still value in that higher degree granting system.*

- *I think they're very valuable… there are many times, just as an example, that we're dealing with a performance issue and coaching is the right way to go versus discipline. And I think that micro-credentials really partner well with coaching.*

- *I think our industry finds them pretty valuable because it's very niche type learning. Like you can't just go anywhere and learn how to be a logger, how to drive a log truck and we really need, and we really need those people, so they're pretty important.*

- *I think they do [provide value] provided that they're industry- driven. If our industry identifies a need to have something offered, great.*

- *Well, for me, very valuable. I think it shows the person's had exposure to whatever the targeted credentials are, and they've made the effort and taken the time to try and learn them and pass them.*

Employers did not have experience with receiving resumes that included digital badges, or micro-credentials, but stated they would consider it as an asset depending on its legitimacy, the granting organization, and the skills obtained. Again, there was some uncertainty around this concept as it still seems relatively new to employers in the region. The key takeaway is that employers would view the attainment of a micro-credential as indications of initiative and a goal of lifelong learning.

- *I think it would be very valuable. Absolutely. We would not expect people who would be fabulous, but not everybody's going to come to us with a two-year diploma or even a one-year certificate. So, if they had some credentials, micro-credentials showing that they have been on track, they're interested. Absolutely. That would hold value.*

- *As long as it's certified, recognized by a well-known educational institution… It would be an advantage to see on someone's resume because as an employer, I would prefer an employee that can be multi-tasker. So, we're all engineers or technologists, but we are also doing the financial, the administrative, the marketing, so any additional skills really is a big bonus for them or their employer.*

Benefits and Challenges of Micro-credentials

Interviewees shared their perspectives on the benefits of micro-credentials for students, employers, and institutions. Some of the benefits included increasing access to education, particularly in the region where many enter the workforce directly from secondary school. It also allows students to choose their own pathway and gives them agency over their educational experience.

- *We have a lot of entrepreneurs, or business owners, many of them have come about to be an entrepreneur through the trades system. They're not interested in going and getting a full degree, but do they want to better understand finance so that their businesses are safer? Absolutely. I think it allows people to be able to get the*

education in a focused area where they need it. And also, it's not such a daunting task.

– *Most of these folks are high school graduates who are getting a job [here] and then taking the credentialing from there. And I think that… we need that. We need that proportion of labour. If folks were to need to take a two-year program before taking our lumber grading, it would probably shrink the pool. It would probably be more difficult to attract them to some of our remote locations.*

Some concerns or challenges related to micro-credentials included quality of assessments, governance, and implementing them within highly regulated fields. Cost was also noted by employers as one factor that they would need to consider before sending an employee for a micro-credential, particularly for those organizations already delivering internal training or competency testing. It was also referenced in relation to added cost for learners who are already in the workforce.

– *I think they'd have to be cost effective because, right now we are using eSkill and we set up our own tests and we do this and it's very low cost for us and we get what we need, and we get to reuse it. And so, to go to an institution to do this, there's so many players out there in the industry right now.*

– *It drives up the cost. It takes people who are already perfectly competent and makes them go to a course for six weeks or a month or whatever it is. We experienced this with power engineers… And we're also starting to see it on the trucking side where there's some micro-credentialing coming in. And so, what we're seeing is there are massively long line-ups to get it, and if people don't have it, they can't work.*

Quality assurance, validity, and assessments were key concerns among employers and industry associations. Given that there is no governing body for micro-credentials at this point, employers stressed the need for a formal structure in order to be able to place trust in the credentials themselves.

– *If you have a degree, there's some level of consistency because of the larger education system, but who governs micro-credentials?*

– *We'd need to understand the tests and the validity and how well they were being measured and what benchmarks were being targeted.*

Several key industries in northern Alberta are highly regulated, such as oil and gas, forestry, construction, and health care. Employers and associations from these industries highlighted the importance of ensuring micro-credentials are meeting those regulatory requirements, and had difficulty seeing how new micro-credentials could enter the space when organizations and associations are already offering the required courses or certifications.

- *Depends on what the competency is, because if that's a competency that's linked to, let's say for example, the health services… So, if it's something that is linked with the accrediting body, you would have to ensure that that assessment aligns with that standard.*

- *I think probably in healthcare we place a lot of emphasis on credentials, and where they're coming from, if they're valid… I do think that here within the facility internal to the organization, if we put out a module or whatnot, we're just very governed in what we can do and what we can't do.*

Institutional representatives were also concerned about the financial and human resources required to redevelop programs into micro-credentials, and some expressed concern about micro-credentials being another form of continuing education. They found it important to differentiate between the two, or at least ensure there is no duplication both from the perspective of credential development, and, from a student perspective, simply offering more courses to gain a profit. Institutions also noted recent cuts to postsecondary education funding, which may put a strain on current resources. One of the institutions interviewed noted a committee already engaged in planning for the launch of micro-credentials in the higher education system, indicating a need for some formal recognition system to be developed in order to introduce them in an effective manner.

- *Everybody's kind of rushing to do it in their own way. I am concerned about quality. I am concerned about inconsistency. I am concerned about faculty buy-in. I am concerned about recognition of workload. I'm concerned about duplication and competition, and I'm concerned about the human resourcing to make it possible.*

- *The funding has been cut substantially, so to introduce something that's going to have to take on greater costs. You're going to require resources to break down all those programs. It's not something we can just turn around tomorrow and say, okay, we're going to do this. We have to look at badging systems. So, the investment in something that right now we're not even sure is going to take off and we're already under budget constraints. That concerns me – do we want to spend our dollars on this, or do we want to wait until the dust settles and find out exactly what everybody's going to do? Do you want to be the leader, or do you want to just kind of sit back and wait to see what happens?*

Employer Skills Needs

Responses varied when it came to skillsets that would be well-suited for micro-credentials, but not surprisingly, they were very specific to the particular industry. This speaks to the importance of working with employers to see the exact skills needs in the sector. Stakeholders also noted soft skills such as leadership, communication, cultural awareness, and essential skills as suitable for micro-credentials.

- *The biggest micro-credential, at all levels of the organization would be safety. Number one, because we're very safety sensitive work environments. We do have some specific things that we focus on, but then we also look for, mini courses and, and workshop events that are around safety, behaviours, culture, leadership. I think communication, conflict, those types of things is what we see the most need for our company. We're putting a large focus on things like inclusion and diversity and cultural awareness.*

- *Some of the communication skills, technology skills, essential skills, those are all well established that could easily be put into an assessment type badge and maybe a few of those to form a micro-credential in communication.*

- *I think truck driving is a big one because knowing how to drive a truck that hauls freight on the highway and knowing how to drive a logging truck are totally different things. Accessing that training is really tricky and we're noticing there's a real labour crunch in that section of our industry. Skills gap and an interest gap... it's a very specialised skillset.*

- *In manufacturing, I think it would be a huge advantage if they had some basic level of mechanical ability, in terms of, can they change a valve? Can they tighten packing? Can they tighten the fitting? Can they change out a belt? Electrical, just basic understanding of how a control system might work, how a pneumatic or an electric valve might work.*

Building upon the need to work with employers, interviewees expressed the need to align the competencies with local industry.

- *Employers and industry and governing bodies need to be engaged to ensure that their needs are being addressed. I see so many excellent faculty, excellent instructors, developing curriculum, but do they really realize what is in need in the community if they're not boots on the ground right now?*

- *A lot of the big industries do their own training anyway. So, it's going to have to be working with them in terms of ways to complement what they do, not replace what they do, but to compliment it.*

- *I feel like with GPRC, if they act on that, I think that's going to be well-received and well-utilized and, it'll really help reinforce their community partnership.*

Conclusion

Generally, interviewees echoed similar challenges and opportunities in micro-credentialling that were identified in other research components. Where institutional representatives are concerned about a lack of resources and the proper way to fit micro-credentials into the credential framework, they are confident in the value that they would hold should they be implemented correctly. The overarching theme of developing guidelines and a framework was present in these discussions, as was the need for consulting with partnering with local industry and employers to develop practical, realistic goals for micro-credentials. Employers were also optimistic about what micro-credentials could do for learners and employers and reiterated the need for a system that aligns and assesses competencies. Ultimately, the interviews revealed constructive feedback from participants and reaffirmed that the LEARN members are moving in a positive direction.

Table 7: Stakeholder Consultation Key Themes

Theme	PSE	Industry
Awareness of micro-credentials	• All PSE representatives aware of MCs	• 3 not aware of MCs • 3 aware of the concept but not the term • 4 aware of MCs
Definition	• Definition aligned with literature and research • More comprehensive understanding	• Difficulty defining MCs in a consistent way
Key words	• Assessment • Skills • Competencies • Pathway • Stackable	• Short • Skills • Competencies • "Bite-sized" • Stackable
Perceptions	• Overall valuable • Unsure if employers or students value them yet given no formal framework	• Overall valuable • Demonstrates lifelong learning • Ideal for responding to industry needs • Must be developed to align with industry • Importance of trusted source
Skills	• Health-related • Communication • Technology	• Technical • Leadership • Interpersonal • Time-management • Health-related • Technology/Digital • General IT • "Basic skills"
Benefits	• Institutional relationship with community, employers • Flexible learning for students/current workers • Recognition of non-credit training or learned experience • Upskilling or reskilling	• Employers can upskill their employees • Access to education for non-traditional learners
Challenges	• Concern about repackaging current offerings, confusing the market • Quality assurance • Lack of definition • Current financial cutbacks	• No standard • Cost

Discussion & Analysis

Micro-credential Design

While there has been considerable discussion of micro-credentials within academe and government, there is still limited familiarity with the public and business (Pichette, 2020). There is a benefit to having a jurisdictionally approved definition for micro-credentials and funding to support delivery of micro-credentials. A provincial definition and broad implementation would enhance market awareness and government funding would reduce the cost to prospective students. Such changes would have policy implications that have not been considered within the scope of this paper. Pending a provincial definition and funding changes in Alberta, institutions can develop their strategy locally. There is a benefit to working as a consortium in a region, with consistent implementation, to enhance awareness and build perceived value with both the public and business.

As identified in the literature review, micro-credentials are promoted for two overlapping objectives. The first is to provide shorter, industry-specific training that would improve employability or meet on-the-job training requirements. The second is to make postsecondary education more modularized, allowing individuals to obtain credit towards credentials based on prior learning as well as to step in and out of the formal education system on a more frequent basis. The tension between these two objectives is the basis for some of the different approaches by jurisdictions and institutions.

The first objective creates a focus on providing adaptable, industry-specific micro-credentials. The micro-credential could be of short duration and may only be offered for a short period. Colleges have traditionally provided this learning as either continuing education courses or as contract training. The nomenclature is changing, and there is movement towards new methods of recognizing the completion of the learning, but the considerations are consistent.

The second objective promotes micro-credentials as modules of credentials, as part of a larger change to education. The desire to have laddered, or stackable, micro-credentials that are an access to or a bridge between credentials. This second objective requires the micro-credential to be embedded within the structure of a program and subject to the quality management processes of the jurisdiction and the institution.

Institutional credentials are designed around courses with outcomes, and programs have explicit entry requirements that identify prior learning which enhances the likelihood of success in the program. The duration of courses and the structure of learning are influenced by jurisdictional and institutional policies as well as the completion of outcomes, as the student is expected to complete the full credential.

Within a credential, courses may have pre-requisites, to ensure that students have the foundational learning required to be successful. For example, Nursing I, before Nursing II, before Nursing III. Some courses are foundational to a number of further courses, for example, anatomy in Nursing, or a math course that may be foundational to further courses for both stairway installation and roof framing within a renovation program.

Multiple courses in a credential could be one micro-credential. Using the nursing example, Nursing I, Nursing II and Nursing III could be one micro-credential, as the skill or competency that improves employability is tied to all courses being completed.

A course in a credential could be included in multiple micro-credentials. Using the math course as an example, the course could be in both a stairway installation micro-credential and a roof framing micro-credential. Alternatively, the math elements in a credential course could be structured as a separate micro-credential, and that micro-credential would then need to be a pre-requisite for other micro-credentials.

A move towards micro-credentials will require institutions to identify the expected entry requirements or learning that would be required for someone to be successful, equivalent to that provided for credentials or part-time credit courses currently.

The consideration of micro-credentials as credit versus non-credit is an additional complexity. If a micro-credential were credit based, then the learning could be included within the current credit transfer considerations for institutions, consistent with how many institutions view credit courses taken by part-time students. In this case, students would be able to ladder their micro-credential without any further assessment.

Prior Learning Assessment and Recognition (PLAR) policies require colleges to give credit towards program learning outcomes regardless of how the learning was obtained. Non-credit micro-credentials could be included under such policies, but students may be required to undertake additional re-assessment before credit is provided towards a credential.

Within the Alberta context, a micro-credential should be shorter than one term duration, or equivalent, as a Certificate can be obtained in one term under the Alberta Credential Framework. The term length duration should be converted to hours and/or credits to provide comparison to the delivery of Certificate programs with Alberta colleges.

There are practical considerations when integrating micro-credentials into an existing credential. The alignment of courses and micro-credentials can be challenging. The courses in a program are structured and designed to optimize the experience and outcomes for a student who will complete the full credential. A student that has completed a micro-credential may not have covered the learning associated with full courses in a credential, but components of a number of courses. They therefore must complete all the courses in the credential in any case.

The current policies also create complications for successful recognition of a micro-credential. A student is full or part-time for an academic term depending on the number of classes or credits in which they are registered. If a student previously completed some of this work, and this is recognized through an assessment of prior learning, such as one or more micro-credentials, then the student may not need to, or in some cases is prevented from, taking that content again. While the benefit is a student does not have to pay for, or spend time, learning something again, this can also mean that a student is not taking enough courses or credits to be considered full-time in a particular academic term. Long standing institutional and governmental policies and regulations treat part-time students differently when it comes to access to classes, priority of access, tuition fees, the level and sometimes scope of mandatory fees (e.g., student athletics, Student Association), tax deductions, scholarship and award eligibility, student funding eligibility, and sometimes even continuation in particular course of studies.

These considerations make moving towards a fully integrated micro-credential framework very challenging without changes to the jurisdictional structures and funding related to postsecondary programs. A structure similar to the Alberta Council on Admissions and Transfer would be required to support the transferability and there would need to be other policies assessed. There are significant jurisdictional and institutional policies that a more modularized, micro-credential system could affect. Policies impacted would include:

- Tuition policies, often tied to course loads and credential;
- Education funding, often tied to course loads or full-time equivalency;
- Tax policy, RESP, tax deductions often tied to full-time or part-time status; and
- Employment insurance programs, often tied to full-time status and program duration.

Systems, Technology and Verification Implementation

As identified, micro-credentials are driving an evolution in the use of digital systems for verification. One aspect is to allow the holder of the micro-credential to easily demonstrate what they have achieved, with employers having assurance that the micro-credential has been earned. There are a number of options available to institutions to record and verify micro-credentials.

1) **Institutional Systems –** expand or utilize existing institutional systems, normally a combination of digital and paper-based components, to include micro-credentials.

2) **Private Labeling or White Boxing -** third party services or digital credential capability. For example, in manufacturing, a factory will affix the same products with store or brand labels. In some cases, there are slight changes to the products according to specifications provided, and efficiencies come from the infrastructure. In computing, a similar approach is used and has been known as white labeling or

white boxing. With the number of badge providers in the space, more private or white labeling services, like Accredible are likely to emerge (Accredible, n.d.). This would mean an institution could offer its own digital credentials under its own brand but hosted by a service provider. As a common example of a white labeling practice, Microsoft 365 provides private organizations email hosted on Microsoft's infrastructure, but from an institution's domain address. The advantage to a private labelling approach is there is a direct connection between the institution, students and employers: Students and employers can reach out directly to the institution with questions or inquiries, and connection and success are associated with the institution. The risk is that service problems also appear to be owned by the institution.

3) **Partnerships –** a partnership of institutions developing a digital credential infrastructure. Under the visible surface, a single shared infrastructure could exist, and the institutions could have their own private brand digital credential "service front". This collaboration could then extend to other relevant and related areas when it comes to micro-credentials. Employers, agencies and organizations could leverage this infrastructure for their own white label digital badges related to workforce training requirements. Such connections could grow into arrangements for delivery of institutional micro-credentials or badges for this training.

Micro-credential Implementation

As noted above, there is limited understanding of micro-credentials in the marketplace, but a strong desire that they be tightly connected to employment needs. Many of the skills or competencies could be sector specific. The labour market analysis identified some skills, such as project management, staff management, conflict management or customer service, that could be delivered through a common micro-credential to multiple sectors. Employer interviews also identified common skills, such as communications, conflict management, or safety leadership as desirable micro-credentials. Micro-credentials can support both upgrading individuals to meet employment of current occupations, as well as provide skills for emerging occupations, where the skills have not yet been included within larger credentials.

The current credentials offered by the institutions have many of the desired skills and competencies included within them, but consistent terminology is not used that would allow the identification of these skills and competencies. Others, especially more emergent skills or competencies may not have yet been included within a credential and would not be able to ladder or stack into an existing credential.

Historical challenges associated with short-term training are consistent with those identified within the literature review for micro-credentials; developing a sufficient market to make offering the training viable while determining funding support that allows the cost

to participants to be feasible. Colleges have historically had strong connections to the labour market, with outreach into the community at both the institutional and program levels. There is also a long history of providing continuing education and contract training to industry.

There are a number of routes to developing a range of micro-credentials, having them understood by the marketplace, and reinforcing the connection to industry.

1) **Embedded micro-credentials** – there are specific skills and competencies learnt and assessed within credentials that can be identified as the elements of a micro-credential. The fastest way to build a library of micro-credentials is to identify and award micro-credentials which are already components of a program and award the micro-credential in addition to the credential. An example could be the micro-credentials for competencies in Word, Excel and Bookkeeping, which are included within a one-year Office Administration Certificate. The micro-credentials could be part of a course or a group of courses that provide the required skill or competency, with specific assessments associated with the micro-credential. A student would not have to obtain all micro-credentials to graduate, depending on the structure developed. In our example, the student may have earned the Word and Excel micro-credential at the end of Term 1, with the Bookkeeping micro-credential not completed until Term 2. The micro-credentials would effectively provide more detail on the skills and competencies obtained with a credential. Students could be awarded the micro-credentials earned prior to graduation, which could enhance their employment or co-op opportunities. These micro-credentials can be offered stand-alone based on demand.

2) **Online micro-credentials** – development of online micro-credentials, with both learning and assessment completed online, would allow for a larger market and provide greater flexibility for students compared to those that require attendance at specific times and places. These micro-credentials would be competing with offerings from a large number of institutions, and additional web-based support may be required as students from outside the transitional jurisdictions access the micro-credentials. There are also access issues due to limited internet access in rural areas. The up-front development costs for major online initiatives courses can be significant. The use of consortium can reduce this impact, but institutional resources would limit the pace of development. Consortium would enable better communication to larger employers that cross institutional boundaries and would support better outreach and market development.

3) **Blended delivery micro-credentials** – would move theory elements to online delivery and provide physical access to equipment or facilities where the learning or assessment requires. There are some upfront development costs, but more expensive simulations or models are avoided. The learner also has the benefit of psychomotor skill development, which cannot be provided as effectively through some simulators. Working in a consortium would provide expanded physical access and reduce costs associated with the online development. As with online micro-credentials, a consortium would expand market access and may resonate better with larger employers that cross institutional boundaries.

4) **"White Label" micro-credentials** – expand online micro-credentials available by working with third party providers, with the material rebranded and offered through the institution. This is the underlying concept to the OntarioLearn consortium, where institutions register students in courses from other colleges. It is also consistent with the model used between edge2go and some colleges. It provides an expanded offer from the college with no upfront or delivery costs. There is a requirement to provide support to the learners and reputational risk must be managed.

5) **Micro-credential resource library** – would allow institutions to identify appropriate micro-credentials for employers or learners where they are not providing such access, as a support for economic development and a resource to the community and employers. It does require active management of the listing and may create reputational risk where identified micro-credentials do not meet customer expectations. There would be no development or delivery costs, but management of the depending on the scale costs may still be beyond institutional resources.

Future Research & Implementation Recommendations

The demand for skills development will continue as emerging technologies change the work environment and economies continue to restructure. Micro-credentials can provide access to short, focussed training and can be designed to ladder to traditional credentials. Local institutions are positioned to assist their communities in bridging between the global resources and local requirements. Micro-credentials will allow institutions to support both emerging and transitional industries, and with increased recognition can have play a key role in accessing post-secondary education.

Based on the research findings and workshops the following are proposed for future research and implementation recommendations:

Future Research

1. The potential of developing a consortium-based digital credential system was identified as a preferred outcome in the workshop (Appendix D). This would provide the opportunity to brand and market micro-credentials associated with the institutions in the consortium and would tie into the concept of the integrated marketing micro-credentials. The costs and benefits of this direction, versus the utilization of existing digital systems, should be researched.

2. The introduction of micro-credentials requires on-going research into the labour market demand for short-term skills development, which can be accomplished through a combination of direct employer engagement and environmental scanning of job posting requirements. The data that is included within this study is largely based on pre-COVID information, due to the timing of the study. This data will not be reflective of any major adjustments to the regional economies resulting from COVID or other significant changes flowing from such a major disruption. It is recommended that the consortium develop an on-going environmental scan to identify changes in employer demand, including those flowing from COVID.

3. Program feasibility for new/emerging program areas in which the partners intend to offer micro-credentials. This would include a collaborative process and set of assessments for determining feasibility that allow for rapid approval and development.

Implementation Recommendations

1. The implementation of a common system and terminology was given highest priority rating in the workshop and would most effectively allow the institutions to build both employer and general public understanding of micro-credentials. It is recommended that a common definition for micro-credentials, and common outcomes and assessments where the same micro-credential is offered by multiple institutions, be adopted. This direction would support the laddering or transferability of micro-credentials in addition to market acceptance.

2. The assurance of quality of micro-credentials is a significant consideration for both employers and prospective students. Post-secondary institutions' quality assurance (QA) processes for credentials, with multi-year timelines and metrics to support the investment in programs, are inappropriate for micro-credentials. Micro-credential QA process would need to be faster, to be more responsive to emerging demands, but still be robust. It is recommended that the LEARN members develop common micro-credential QA processes and metrics, including required levels of industry/employer/community/association engagement, to support the introduction of micro-credentials.

3. Micro-credentials can provide short bursts of training or assessment of skills to meet new or emerging demands, currently in demand by employers or emerging with new industries or from technological change. The workshop identified meeting current demands as being slightly higher priority than anticipated growth areas; this may also assist in developing broader employer and public interest. Many of these competencies, especially the soft skills and those related to health, business and information technology, are embedded within existing credential programs.

4. Pathways or laddering from micro-credentials to credentials is highly desired by prospective students and employers. Micro-credentials and credentials do not have to be based on the same course or delivery models but having some alignment of outcomes (skills or competencies) is required to support pathways. A micro-credential may include the outcomes of one or more credential courses, or a micro-credential may only cover some of the outcomes of one course. It is recommended when possible that courses and micro-credentials be aligned, to allow effective laddering.

5. Where the need for a micro-credential is identified and outcomes and assessments cannot be identified within credentials of one or more of the consortium members, it is recommended that new a collaborative micro-credential be identified and implemented.

Implementation Recommendations

01 Consortium & Partnerships	02 Definition	03 Framework	04 Quality Assurance
08 On-going Research	07 Method of Delivery	06 Determine Demand & Need	05 Laddering and Transferability
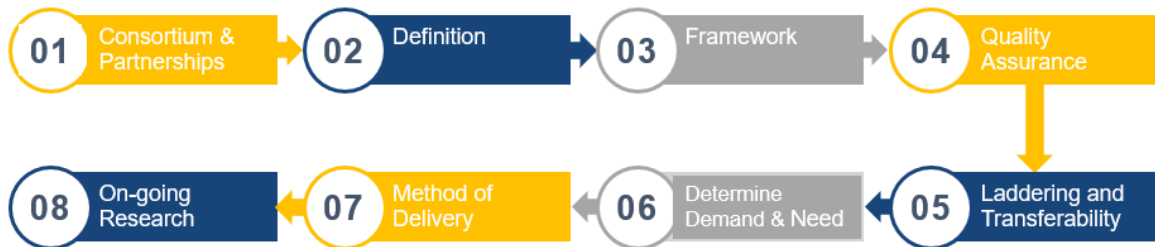
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Appendices

APPENDIX A: ALBERTA MICRO-CREDENTIAL PROGRAM INVENTORY

Micro-Credential	Cost	Length	Delivery Mode	Institution
Basics of Supervising	$389	4 sessions (12 hours)	Online/F2F	Lethbridge College
Coach and Develop Your Team	$289	2 sessions (7 hours)	Online/F2F	Lethbridge College
Communication Strategies	$389	2 sessions (14 hours)	Online/F2F	Lethbridge College
Mastering Difficult Conversations	$289	1 session (8 hours)	Online/F2F	Lethbridge College
Microsoft Essentials Overview	$389	4 sessions (12 hours)	F2F	Lethbridge College
Microsoft Excel Advanced	$289	2 sessions (10 hours)	F2F	Lethbridge College
Microsoft PowerPoint I	$289	1 session (6 hours)	F2F	Lethbridge College
Microsoft Word I	$289	2 sessions (7 hours)	F2F	Lethbridge College
Microsoft Word II	$289	3 sessions (9 hours)	F2F	Lethbridge College

Performance Management	$289	1 session (8 hours)	Online/F2F	Lethbridge College
Personal and Virtual Communication	$289	23 sessions	Online	Lethbridge College
NFPA 1041 Level I	795 per level (two levels for full program)	20-30 hours per level (up to 26 weeks)	Hybrid	NorQuest College
Inclusion at Work	$35	1.5 hours	Online	NorQuest College
Flight Attendant	$1,900	36 hours	F2F	NorQuest College
Career Moves Program	$50	100 hours	Online	NorQuest College
Cannabis Trimming and Production	$695	15 hours	Online	NorQuest College
Hemp Farming	$285	5 hours	Online	NorQuest College
Hemp Processing and Products	$285	3.5 hours	Online	NorQuest College
Human Bloodborne Pathogen Exposure	$40	4.5 hours	Online	NorQuest College
Empowerment and Inclusivity in Health Leadership	$150	16 hours	Online	NorQuest College
Building a Respectful Workplace		4 hours	F2F/Online	NorQuest College

Leadership, Communication, and Culture	$249	4 hours	F2F/Online	NorQuest College
The Talent War: Attracting and Retaining		4 hours	F2F/Online	NorQuest College
Service Design and Customer Experience		4 hours	F2F/Online	NorQuest College
Planning and Leading Change	$249	4 hours	F2F/Online	NorQuest College
Problem Solving and Decision Making	$249	4 hours	F2F/Online	NorQuest College
Basic Leadership Principles	$249	4 hours	F2F/Online	NorQuest College
Leadership	$2,780	80 hours	Online	Athabasca University
Essential Skills for Leaders	$2,780	80 hours	Online	Athabasca University
Leading Self	$720	20 hours	Online	Athabasca University
Communication & Conflict Resolution	$720	20 hours	Online	Athabasca University
Dream Teams	$720	20 hours	Online	Athabasca University
Implementing a Digital Future	$720	20 hours	Online	Athabasca University

Leadership in Action	$720	20 hours	Online	Athabasca University
Leading for Legacy	$720	20 hours	Online	Athabasca University
Leading Others	$720	20 hours	Online	Athabasca University
Leading Processes	$720	20 hours	Online	Athabasca University
Leading Transformational Change	$720	20 hours	Online	Athabasca University
Leading with Authenticity	$720	20 hours	Online	Athabasca University
Project Management	$4,800	120 hours	Online	Athabasca University
Project Launch	$1,200	30 hours	Online	Athabasca University
Project Planning	$1,200	30 hours	Online	Athabasca University
Project Execution	$1,200	30 hours	Online	Athabasca University
Project Practicum with Multiple Projects	$1,200	30 hours	Online	Athabasca University
Digital Transformation Leadership Certificate	$2,780	80 hours	Online	Athabasca University
Decoding Disruptive Technologies	$720	20 hours	Online	Athabasca University

Crafting a Digital Strategy	$720	20 hours	Online	Athabasca University
AWS Academy Cloud Foundations	$720	20 hours	Online	Athabasca University
Leading Transformational Change	$720	20 hours	Online	Athabasca University
Implementing a Digital Future	$720	20 hours	Online	Athabasca University
Accessible Spaces 101	$720	16 hours	Online	Athabasca University
Rick Hansen Foundation Accessibility Certification Training	$2,500	84 hours	Online	Athabasca University
Using Machine Learning for Competitive Advantage	$720	20 hours	Online	Athabasca University
Navigating Extraordinary Times	free	90 min	Online	Athabasca University
Coach Approach for Leadership Development	$720	10 hours	Online	Athabasca University
Embracing Allyship & Inclusion	$420	7 hours	Online	Athabasca University
Community Service Learning Certificate		200 hours (equivalent-- 15 credits)	F2F	University of Alberta
3D Printing in the Maker Multiplex I		2.5 hours	F2F/Online	University of Calgary

5-Star LinkedIn Profile	2.5 hours	F2F/Online	University of Calgary
Advancing UCalgary Level I	2.5 hours	F2F/Online	University of Calgary
An Introduction to Insights Discovery	2.5 hours	F2F/Online	University of Calgary
Arduino Basics	2.5 hours	F2F/Online	University of Calgary
Calculating Sample Size	2.5 hours	F2F/Online	University of Calgary
Career Explorer	2.5 hours	F2F/Online	University of Calgary
Conducting Interviews and Focus Groups	2.5 hours	F2F/Online	University of Calgary
Coveted Cover Letter	2.5 hours	F2F/Online	University of Calgary
Designing Survey Items	2.5 hours	F2F/Online	University of Calgary
Developing Grant Budgets	2.5 hours	F2F/Online	University of Calgary
Developing Recruitment Materials	2.5 hours	F2F/Online	University of Calgary
Developing your Teaching Dossier	2.5 hours	F2F/Online	University of Calgary

Developing Your Teaching Philosophy Statement	2.5 hours	F2F/Online	University of Calgary
Git Basics	2.5 hours	F2F/Online	University of Calgary
Interview Like a Pro	2.5 hours	F2F/Online	University of Calgary
Intro to Machine Learning	2.5 hours	F2F/Online	University of Calgary
Nursing Practice Educator	2.5 hours	F2F/Online	University of Calgary
NVivo Fundamentals	2.5 hours	F2F/Online	University of Calgary
Participant Recruitment Strategies	2.5 hours	F2F/Online	University of Calgary
Python Basics	2.5 hours	F2F/Online	University of Calgary
Qualtrics Fundamentals	2.5 hours	F2F/Online	University of Calgary
Research Abstracts	2.5 hours	F2F/Online	University of Calgary
Research Posters	2.5 hours	F2F/Online	University of Calgary
Scholarly Publishing Essentials	2.5 hours	F2F/Online	University of Calgary

Scholarly Writing I	2.5 hours	F2F/Online	University of Calgary
Scholarship of Teaching and Learning	2.5 hours	F2F/Online	University of Calgary
Standout Résumé	2.5 hours	F2F/Online	University of Calgary
Survey Design	2.5 hours	F2F/Online	University of Calgary
Talent Management Teaming Effectiveness Badge	2.5 hours	F2F/Online	University of Calgary
Think Programming	2.5 hours	F2F/Online	University of Calgary
UCalgary Badges Member	2.5 hours	F2F/Online	University of Calgary
Understanding Curriculum	2.5 hours	F2F/Online	University of Calgary
Working with HoloLens 2: Basics	2.5 hours	F2F/Online	University of Calgary
3D Printing in the Maker Multiplex II	7.5 hours	F2F/Online	University of Calgary
Academic Integrity Tutorial for Werklund School of Education Students	7.5 hours	F2F/Online	University of Calgary
Advancing UCalgary Level II	7.5 hours	F2F/Online	University of Calgary

Basic Data Analysis in SPSS	7.5 hours	F2F/Online	University of Calgary
Educational Leadership	7.5 hours	F2F/Online	University of Calgary
Learning Theories & Issues in Teaching and Learning	7.5 hours	F2F/Online	University of Calgary
Learning Theories and Teaching Second Language Learners	7.5 hours	F2F/Online	University of Calgary
Managing Data in SPSS	7.5 hours	F2F/Online	University of Calgary
MS Excel for Research I	7.5 hours	F2F/Online	University of Calgary
MS Excel for Research II	7.5 hours	F2F/Online	University of Calgary
Personal Brand All-Star	7.5 hours	F2F/Online	University of Calgary
Personal Career Design All-Star	7.5 hours	F2F/Online	University of Calgary
Practicum	7.5 hours	F2F/Online	University of Calgary
Qualitative Research Skills	7.5 hours	F2F/Online	University of Calgary
Residence Appeal Board Member	7.5 hours	F2F/Online	University of Calgary

Scholarly Writing II	7.5 hours	F2F/Online	University of Calgary
SPSS Fundamentals	7.5 hours	F2F/Online	University of Calgary
TATM - Chemistry TA Training Skills Booster	7.5 hours	F2F/Online	University of Calgary
Teaching in a Clinical Setting	7.5 hours	F2F/Online	University of Calgary
Teaching Second Language Students	7.5 hours	F2F/Online	University of Calgary
3-D Printing	12.5 hours	F2F/Online	University of Calgary
Arduino Microcontrollers	12.5 hours	F2F/Online	University of Calgary
Basics of Science Communication	12.5 hours	F2F/Online	University of Calgary
Brother PE770 Embroidery Machine	12.5 hours	F2F/Online	University of Calgary
Carvey CNC Milling Machine	12.5 hours	F2F/Online	University of Calgary
Continuing Education Course Design Program (CECDP)	12.5 hours	F2F/Online	University of Calgary
Course Design Program	12.5 hours	F2F/Online	University of Calgary

Course Design Program 2020	12.5 hours	F2F/Online	University of Calgary
Developing Your Teaching Dossier: Graduate Students	12.5 hours	F2F/Online	University of Calgary
Developing Your Teaching Dossier: Postdoctoral Scholars	12.5 hours	F2F/Online	University of Calgary
Educational Leadership and Mentorship: Academic Staff	12.5 hours	F2F/Online	University of Calgary
Emerging Teachers Development: Graduate Students	12.5 hours	F2F/Online	University of Calgary
Emerging Teachers Development: Postdoctoral Scholars	12.5 hours	F2F/Online	University of Calgary
High Performance Negotiating	12.5 hours	F2F/Online	University of Calgary
Inquiry and Scholarship in Teaching and Learning: Academic Staff	12.5 hours	F2F/Online	University of Calgary
Item and Survey Design	12.5 hours	F2F/Online	University of Calgary
Launchpad	12.5 hours	F2F/Online	University of Calgary
Learning Spaces & Digital Pedagogies: Graduate Students	12.5 hours	F2F/Online	University of Calgary

Learning Spaces & Digital Pedagogies: Postdoctoral Scholars	12.5 hours	F2F/Online	University of Calgary
MS Excel for Research	12.5 hours	F2F/Online	University of Calgary
Online Educational Development for Field Experience Instructors - Group 1	12.5 hours	F2F/Online	University of Calgary
Online Educational Development for Field Experience Instructors - Group 2	12.5 hours	F2F/Online	University of Calgary
Online Educational Development for Field Experience Instructors - Group 3	12.5 hours	F2F/Online	University of Calgary
Professional Development Apprentice	12.5 hours	F2F/Online	University of Calgary
Professional Development Expert	12.5 hours	F2F/Online	University of Calgary
Quality Graduate Supervision MOOC	12.5 hours	F2F/Online	University of Calgary
Raspberry Pi	12.5 hours	F2F/Online	University of Calgary
Research Skills Foundations	12.5 hours	F2F/Online	University of Calgary
SoTL Foundations: Graduate Students	12.5 hours	F2F/Online	University of Calgary

SoTL Foundations: Postdoctoral Scholars	12.5 hours	F2F/Online	University of Calgary
TATM - Chemistry TA Training Program Completion	12.5 hours	F2F/Online	University of Calgary
Teaching and Learning Practices, Theories and Assessments: Academic Staff	12.5 hours	F2F/Online	University of Calgary
Teaching Assistantship Preparation Program	12.5 hours	F2F/Online	University of Calgary
Teaching in Today's Classroom	12.5 hours	F2F/Online	University of Calgary
Teaching in Today's Classroom and Clinical Setting	12.5 hours	F2F/Online	University of Calgary
Teaching Online Program I	12.5 hours	F2F/Online	University of Calgary
Teaching Online Program I - 2020	12.5 hours	F2F/Online	University of Calgary
Teaching Online Program II	12.5 hours	F2F/Online	University of Calgary
Teaching Online Program II - 2020	12.5 hours	F2F/Online	University of Calgary
Tech Coaching Foundations Program	12.5 hours	F2F/Online	University of Calgary
Tech Time for Teaching: Innovative Practice	12.5 hours	F2F/Online	University of Calgary

Theories and Practices: Graduate Students		12.5 hours	F2F/Online	University of Calgary
Theories and Practices: Postdoctoral Scholars		12.5 hours	F2F/Online	University of Calgary
UAdvance		12.5 hours	F2F/Online	University of Calgary
UBegin		12.5 hours	F2F/Online	University of Calgary
UFundamentals		12.5 hours	F2F/Online	University of Calgary
UManage		12.5 hours	F2F/Online	University of Calgary
Upstanders Program		12.5 hours	F2F/Online	University of Calgary
Virtual Reality Artist in Residence		12.5 hours	F2F/Online	University of Calgary
Administrative Excellence: Professional Development Certificate	$1,995	35 hours (5 courses)	F2F/Online	MacEwan University
Alberta Personal Property Registry Electronic System-APPRES-Registries Online Subscriber (ROL): Professional Accreditation	$449	10 hours (1 course)	F2F/Online	MacEwan University
Behavioural Interventions: Certificate of Achievement	$3,000	200 hours (equivalent-- 5 courses)	F2F/Online	MacEwan University

Bookkeeping & Accounting Technology: Professional Development Certificate	$1,959	65 hours (5 courses)	F2F/Online	MacEwan University
Business Analysis & Professional Communication: Executive Professional Development for International Students	$17,000	1 year (full-time)	F2F	MacEwan University
Business Analysis: Professional Development Certificate	$3,781	119 hours (7 courses)	F2F/Online	MacEwan University
Certificate of Achievement in Sustainability: Certificate of Achievement	$2,100	160 hours (4 courses)	F2F/Online	MacEwan University
Corporate Registry System (CORES) Level I: Professional Accreditation	$440	15 hours	F2F/Online	MacEwan University
Corporate Registry System (CORES) Level II: Professional Accreditation	$440	15 hours	F2F/Online	MacEwan University
Corporate Registry System (CORES) Level III: Professional Accreditation	$440	15 hours	F2F/Online	MacEwan University
Digital Experience Design Foundation: Professional Development Certificate	$2,600	96 hours (4 courses)	F2F/Online	MacEwan University

Digital Media and Graphics Foundation: Professional Development Certificate	$2,173	90 hours (5 courses)	F2F/Online	MacEwan University
Global Logistics Management & Professional Communication: Executive Professional Development for International Students	$17,000	1 year (full-time)	F2F	MacEwan University
Global Logistics Management: Professional Development Certificate	$6,300	126 hours (8 courses)	Online	MacEwan University
Leadership: Professional Development Certificate	$2,394	42 hours (6 courses)	F2F/Online	MacEwan University
Management and Supervision: Professional Development Certificate	$2,793	49 hours (7 courses)	F2F/Online	MacEwan University
Photography: Professional Development Certificate	$1,905	96 hours (5 courses)	F2F/Online	MacEwan University
Program and Portfolio Management: Professional Development Certificate	$1,796	28 hours (4 courses)	F2F/Online	MacEwan University
Project Management & Professional Communication: Executive Professional Development for International Students	$17,000	1 year (full-time)	F2F	MacEwan University

Project Management: Professional Development Certificate	$3,696	112 hours (8 courses)	F2F/Online	MacEwan University
Social Innovation: Professional Development Certificate	$2,400	60 hours (4 courses)	F2F/Online	MacEwan University
Visual Art Foundation: Professional Development Certificate	$1,417	96 hours (5 courses)	F2F/Online	MacEwan University
Web Design and Development: Professional Development Certificate	$2,035	88 hours (5 courses)	F2F/Online	MacEwan University
Arts Funding	$2,200	135 hours (2 courses plus 3 2-day workshops)	F2F/Online	Alberta University of the Arts
Arts Marketing	$2,200	135 hours (2 courses plus 3 2-day workshops)	F2F/Online	Alberta University of the Arts
Finance for Arts Business	$2,200	135 hours (2 courses plus 3 2-day workshops)	F2F/Online	Alberta University of the Arts
Arts Management	$2,200	135 hours (2 courses plus 3 2-day workshops)	F2F/Online	Alberta University of the Arts
Client Problem Solving			Online	Bow Valley College
IBM Business Intelligence Analyst	$979	36 hours	Online	Bow Valley College
Administrative Essentials Certificate	$2,310	138 hours (10 courses)	Online	Grande Prairie Regional College

Basic Bookkeeping Certificate	$1,025	78 hours (2 courses)	F2F/Online	Grande Prairie Regional College
Office Advanced Certificate	$1,000	60 hours (4 courses)	Online	Grande Prairie Regional College
Office Essentials Certificate	$1,000	60 hours (4 courses)	Online	Grande Prairie Regional College
Blue Seal Certificate	$2,500	150 hours (10 courses)	F2F/Online	Grande Prairie Regional College
Advanced Human Resources Certificate	$1,600	112 hours (8 courses)	F2F/Online	Grande Prairie Regional College
Human Resources Essentials Certificate	$1,600	96 hours (8 courses)	F2F/Online	Grande Prairie Regional College
Crisis Response Management (Pace) Certificate		72 hours (6 courses + 12 hours electives)		Grande Prairie Regional College
Cybersecurity Certificate	$699	40 hours (8 courses)	Online	Grande Prairie Regional College
Data Analytics Certificate	$834	30 hours (6 courses)	Online	Grande Prairie Regional College
Digital Media and Marketing Certificate	$1,788	49 hours (12 courses)	Online	Grande Prairie Regional College
Emerging Technology for Managers Certificate	$299	9 hours (3 courses)	Online	Grande Prairie Regional College
Entrepreneurship Certificate	$3,774	15 hours (14 courses)	Online	Grande Prairie Regional College

Global Business Professional Certificate (CGBP Exam Prep)	$1,099	40 hours (4 courses)	Online	Grande Prairie Regional College
Management Essentials Certificate	$1,950	72 hours (6 courses)	Online	Grande Prairie Regional College
Project Management Certificate	$3,740	150 hours (10 courses)	Online	Grande Prairie Regional College
Purchasing Professional Certificate	$1,800	56 hours (6 courses)	Online	Grande Prairie Regional College
Web Design Certificate	$599	18 hours (6 courses)	Online	Grande Prairie Regional College
Advanced Skills for Leadership		6 courses	F2F/Online	Northern Lakes College
Asset Management Professional	$6,000	(140 hours) 7 courses	F2F/Online	Northern Lakes College
Essential Skills for Administrative Professionals	$3,200	(96 hours) 8 courses	F2F/Online	Northern Lakes College
Essential Skills for Instructors/Facilitators		5 courses	F2F/Online	Northern Lakes College
Essential Skills for Supervisors	$3,600	9 courses	F2F/Online	Northern Lakes College
Forest Stewardship	$600	6 courses	Online	Northern Lakes College
Certified Asset Management Professional Program	$5,000	6 courses	Online	Northern Lakes College

Maintenance Management Professional	$7,200	8 Modules	Online	Northern Lakes College
Water and Wastewater Operator		5 courses	F2F/Online	Northern Lakes College
Strategic Success for Businesses during COVID-19	$100	1 hour (1 course)	Online	Red Deer College
Accounting Technician Certificate	$5,600	300 hours (5 courses)	Hybrid	Red Deer College
Advanced Management Certificate	$3,250	100 hours (5 courses)	Hybrid	Red Deer College
Leadership Development Certificate	$2,750	100 hours (5 courses)	Hybrid	Red Deer College
Management Skills for Supervisors Certificate	$1,100	24 hours (1 course)	Hybrid	Red Deer College
Project Management Fast Track	$4,550	112 hours (7 courses)	Hybrid	Red Deer College
English as a Second Language Certificates	$3,800	200 hours	Hybrid	Red Deer College
Alberta Seniors Communities and Housing Association Certificates	$3,150	42 hours (7 courses)	Online	Red Deer College
Trauma-Informed Educator's Certificate	$1,900	48 hours (3 courses)	Hybrid	Red Deer College
Pre-Employment Trades	$5,200	360 hours (12 weeks or 34 weeks)	Hybrid	Red Deer College

Business Management Certificate		39 credits	F2F/Online	Burman University
Crisis Intervention Certificate		31 credits	F2F/Online	Burman University
Gerontology Certificate		30 credits	F2F/Online	Burman University
Sports Psychology Certificate		31.5 credits	F2F/Online	Burman University
Substance Abuse Certificate		30 credits	F2F/Online	Burman University
Micah Certificate in Justice and Development		18 credits	F2F/Online	The King's University
SAFe Advanced Scrum Master	$900	2 days	Online	St. Mary's University
SAFe Agile Software Engineering	$900	2 days	Online	St. Mary's University
SAFe for Architects	$2,000	3 days	Online	St. Mary's University
SAFe DevOps	$900	2 days	Online	St. Mary's University
SAFe for Government	$900	2 days	Online	St. Mary's University
Leading SAFe	$900	2 days	Online	St. Mary's University
SAFe Lean Portfolio Management	$900	2 days	Online	St. Mary's University

SAFe Product and Solution Management	$900	2 days	Online	St. Mary's University
SAFe Product Owner/Product Manager	$900	2 days	Online	St. Mary's University
SAFe Release Train Engineer	$900	2 days	Online	St. Mary's University
SAFe Scrum Master	$900	2 days	Online	St. Mary's University
SAFe for Teams	$900	2 days	Online	St. Mary's University
ICAgile Fundamentals	$900	2 days	Online	St. Mary's University
ICAgile Programming	$900	2 days	Online	St. Mary's University
ICAgile Team Facilitation	$900	2 days	Online	St. Mary's University
ICAgile Test Automation	$900	2 days	Online	St. Mary's University
Productivity and Continuous Improvement	$558	14 hours	Online	Northern Alberta Institute of Technology
Team Building & Facilitation	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Charter Development	$558	14 hours	Online	Northern Alberta Institute of Technology

Project Schedule Management	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Management Tools	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Cost Management	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Communications Management	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Risk Management	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Quality Management	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Procurement Management	$558	14 hours	Online	Northern Alberta Institute of Technology
Project Human Resource Management	$558	14 hours	Online	Northern Alberta Institute of Technology
.NET Development: Certificate of Achievement		6 courses	F2F/Online	Southern Alberta Institute of Technology
3D Modeling and Design Fundamentals: Statement of Completion	2 courses	F2F/Online		Southern Alberta Institute of Technology

Administrative Professional: Statement of Completion	4 courses	F2F/Online	Southern Alberta Institute of Technology
Applied Management: Certificate of Achievement	144 hours (12 courses)	F2F/Online	Southern Alberta Institute of Technology
Applied Project Management: Certificate of Achievement	7 courses	F2F/Online	Southern Alberta Institute of Technology
AutoCAD: Statement of Completion	4 courses	F2F/Online	Southern Alberta Institute of Technology
Basic 2D Game Design: Statement of Completion	2 courses	F2F/Online	Southern Alberta Institute of Technology
Business Intelligence: Certificate of Achievement	9 courses	F2F/Online	Southern Alberta Institute of Technology
CCNA Routing and Switching: Certificate of Achievement	3 courses	F2F/Online	Southern Alberta Institute of Technology
CNC Operator: Certificate of Achievement	6 courses	F2F/Online	Southern Alberta Institute of Technology
Construction Estimating: Certificate of Achievement	8 courses	F2F/Online	Southern Alberta Institute of Technology
Construction Management: Certificate of Achievement	5 courses	F2F/Online	Southern Alberta Institute of Technology

Construction Planning: Certificate of Achievement	8 courses	F2F/Online	Southern Alberta Institute of Technology
DSLR Video Production: Certificate of Achievement	8 courses	F2F/Online	Southern Alberta Institute of Technology
Digital Audio: Certificate of Achievement	3 courses	F2F/Online	Southern Alberta Institute of Technology
Digital Marketing and Social Media: Statement of Completion	7 courses	F2F/Online	Southern Alberta Institute of Technology
Distributed Control & Safety Instrumented Systems: Certificate of Achievement	5 courses	F2F/Online	Southern Alberta Institute of Technology
Electrical Design: Certificate of Achievement	5 courses	F2F/Online	Southern Alberta Institute of Technology
Electrical Systems Principles: Certificate of Achievement	3 courses	F2F/Online	Southern Alberta Institute of Technology
Emergency Medical Responder: Certificate of Achievement	3 courses	F2F/Online	Southern Alberta Institute of Technology
Employment Law: Statement of Completion	10 courses	F2F/Online	Southern Alberta Institute of Technology
Fifth Class Power Engineering: Certificate of Achievement	2 courses	F2F/Online	Southern Alberta Institute of Technology

First Class Power Engineering: Certificate of Achievement	8 courses	F2F/Online	Southern Alberta Institute of Technology
Fourth Class Power Engineering: Certificate of Achievement	2 courses	F2F/Online	Southern Alberta Institute of Technology
Gas Process Operations: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology
Geomatics: Certificate of Achievement	8 courses	F2F/Online	Southern Alberta Institute of Technology
Graphic Design: Certificate of Achievement	7 courses	F2F/Online	Southern Alberta Institute of Technology
Home Inspection: Certificate of Achievement	10 courses	F2F/Online	Southern Alberta Institute of Technology
Hydrocarbon Measurement: Certificate of Achievement	14 courses	F2F/Online	Southern Alberta Institute of Technology
IT Business Analyst: Certificate of Achievement	11 courses	F2F/Online	Southern Alberta Institute of Technology
IT Security: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology
IT Technician: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology

Industrial Instrumentation: Certificate of Achievement	3 courses	F2F/Online	Southern Alberta Institute of Technology
Java Development: Certificate of Achievement	5 courses	F2F/Online	Southern Alberta Institute of Technology
Lean Management: Statement of Completion	4 courses	F2F/Online	Southern Alberta Institute of Technology
Liquefied Natural Gas Process Operations: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology
Liquefied Petroleum Gas Operations: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology
MS Office Access: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology
MS Office Excel: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology
MS Office Word: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology
Microsoft SQL Server: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology
Microstation: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology

Moisture Control: Statement of Completion		2 courses	F2F/Online	Southern Alberta Institute of Technology
North American Land Administration - Surface: Statement of Completion	5 courses	F2F/Online		Southern Alberta Institute of Technology
Oil Patch Introductory Series for Non-Technical Personnel: Certificate of Achievement	4 courses	F2F/Online		Southern Alberta Institute of Technology
Oil and Gas Regulations: Certificate of Achievement		10 courses	F2F/Online	Southern Alberta Institute of Technology
PLC - HMI: Certificate of Achievement		5 courses	F2F/Online	Southern Alberta Institute of Technology
Photography: Certificate of Achievement		3 courses	F2F/Online	Southern Alberta Institute of Technology
Pipeline Operations: Certificate of Achievement		12 courses	F2F/Online	Southern Alberta Institute of Technology
Power Systems: Certificate of Achievement		5 courses	F2F/Online	Southern Alberta Institute of Technology
Production Field Operations: Certificate of Achievement		4 courses	F2F/Online	Southern Alberta Institute of Technology
Professional Respiratory Educator: Statement of Completion		3 courses	F2F/Online	Southern Alberta Institute of Technology

Program Management: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology
Python Programming: Statement of Completion	2 courses	F2F/Online	Southern Alberta Institute of Technology
Revit Essentials: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology
Sales for Technical Professionals: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology
Second Class Power Engineering: Certificate of Achievement	6 courses	F2F/Online	Southern Alberta Institute of Technology
Supply Management Training: Statement of Completion	10 courses	F2F/Online	Southern Alberta Institute of Technology
Third Class Power Engineering: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology
Train the Trainer: Statement of Completion	3 courses	F2F/Online	Southern Alberta Institute of Technology
Unconventional Petroleum: Certificate of Achievement	5 courses	F2F/Online	Southern Alberta Institute of Technology
Upstream Petroleum Industry: Certificate of Achievement	7 courses	F2F/Online	Southern Alberta Institute of Technology

Web Design: Certificate of Achievement	8 courses	F2F/Online	Southern Alberta Institute of Technology
Wireless Networking: Statement of Completion	2 courses	F2F/Online	Southern Alberta Institute of Technology
Worker Safety Management: Certificate of Achievement	4 courses	F2F/Online	Southern Alberta Institute of Technology

Micro-Credentials Offered or Advertised

Offered or advertised	Institution	URL	Institution Type	Badges	Stackable
Yes	Athabasca University	https://powered.athabascau.ca/catalog?pagename=professional-development-courses	CARU	PowerED	Yes
Yes	University of Alberta	https://www.ualberta.ca/community-service-learning/media-library/documents/forms/cslcertifikit2017.pdf	CARU		
Yes	University of Calgary	https://badges.ucalgary.ca/	CARU	Badgr	
No	University of Lethbridge		CARU		
Yes	MacEwan University	https://www.macewan.ca/wcm/SchoolsFaculties/SchoolofContinuingEducation/programs/SCE_00000000274	UU		
No	Mount Royal University		UU		

Yes	Alberta University of the Arts	https://www.auarts.ca/continuing-education/micro-credentials	UU	
Yes	Bow Valley College	https://www.youracclaim.com/organizations/bow-valley-college/badges?sort=most_popular&page=1	CCC	Acclaim
Yes	Grande Prairie Regional College	https://www.gprc.ab.ca/ce/courses/	CCC	
No	Keyano College		CCC	
No	Lakeland College		CCC	

Lakeland College Note: *Uses ed2go, but unclear if there are badges/credentials associated with these offerings, of which there are ~200*

Yes	Lethbridge College	https://lethbridgecollege.ca/departments/corporate-and-continuing-education/micro-credentials	CCC	Badgr
No	Medicine Hat College		CCC	
Yes	NorQuest College	https://www.norquest.ca/current-students/digital-badges.aspx	CCC	Acclaim
Yes	Northern Lakes College	https://www.northernlakescollege.ca/cect	CCC	
No	Olds College		CCC	
No	Portage College		CCC	

Yes	Red Deer College	https://www.rdc.ab.ca/programs/continuing-education/programs-and-courses	CCC	

Red Deer College Note: *Unclear whether some certificates may count as micro-credentials*

	Ambrose University		IAI	
Yes	Burman University	https://www.burmanu.ca/sites/default/files/Registrar/Academic%20Calendars/AcademicCalendar%20%2020-21%202%20October%2027%202020-updated.pdf	IAI	
No	Concordia University of Edmonton		IAI	
Yes	The King's University	https://www.kingsu.ca/research/micah-centre/justice-certificate	IAI	
Yes	St. Mary's University	https://www.stmu.ca/extension-studies/	IAI	ICAgile
Yes	Northern Alberta Institute of Technology	https://www.nait.ca/nait/marketing/micro-credentials	PI	Acclaim
Yes	Southern Alberta Institute of Technology	https://coned.sait.ca/search/publicCourseCertificateSearch.do?method=searchCert&courseSearch.courseDescriptionKeyword=_&quickSearch=true	PI	

APPENDIX B: SKILLS DEMAND BY OCCUPATIONAL GROUP

Table 8. Skills Demand for NOC 121 (Administrative services supervisors) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*83*	*52*	*77*	*41*	*49*	35	
Customer Service	37%	25%	34%	24%	55%	37%	-1%
Scheduling	18%	33%	29%	7%	27%	31%	74%
Performance Management	11%	12%	18%	10%	16%	20%	84%
Budgeting	31%	38%	26%	49%	12%	17%	-45%
Business Process	1%	2%	-	5%	6%	14%	1086%
Customer Complaint Resolution	5%	12%	6%	-	16%	14%	196%
Office Management	23%	17%	9%	15%	4%	14%	-38%
Administrative Functions	7%	6%	3%	5%	6%	11%	58%
Agronomy	-	2%	4%	10%	6%	11%	-
Farm Equipment	-	-	-	-	6%	11%	-
Staff Management	22%	12%	5%	22%	4%	11%	-47%
Territory Management	-	-	-	-	-	11%	-
Upselling Products and Services	-	-	-	-	-	11%	-
Accounts Payable / Accounts Receivable	2%	-	1%	5%	4%	9%	256%
Customer Contact	5%	8%	12%	2%	14%	9%	78%
Forklift Operation	1%	4%	5%	-	4%	9%	611%
Occupational Health and Safety	7%	13%	13%	-	-	9%	19%
Purchasing	2%	-	10%	24%	14%	9%	256%
Quality Assurance and Control	1%	2%	3%	-	2%	9%	611%
Supervisory Skills	7%	-	12%	17%	2%	9%	19%
Teaching	-	6%	-	5%	10%	9%	-
Telecommunications	-	4%	9%	-	-	9%	-
Accounting	8%	4%	13%	27%	10%	6%	-32%
Adult Education	-	-	-	-	-	6%	-
Business Operations	-	-	-	2%	-	6%	-

Table 9. Skills Demand for NOC 223 (Technical occupations in civil, mechanical and industrial engineering) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*173*	*165*	*247*	*219*	*173*	74	
Repair	40%	25%	30%	29%	33%	28%	-29%
Predictive / Preventative Maintenance	16%	11%	10%	11%	8%	22%	39%
Scheduling	12%	7%	15%	10%	9%	14%	11%
Technical Support	3%	-	2%	3%	5%	14%	290%
Natural Resources	-	1%	5%	-	7%	12%	-
Customer Service	8%	6%	6%	6%	16%	11%	34%
SAP	2%	8%	8%	10%	5%	11%	368%
Budgeting	10%	2%	13%	9%	12%	9%	-9%
Mechanical Engineering	2%	4%	3%	3%	4%	9%	445%
Professional Engineer	-	1%	-	2%	3%	9%	-
Equipment Maintenance	2%	4%	6%	2%	3%	8%	368%
Cardiopulmonary Resuscitation (CPR)	1%	5%	4%	4%	2%	7%	1069%
Fall Protection	9%	13%	11%	11%	6%	7%	-22%
Mechanical Maintenance	3%	1%	-	3%	2%	7%	134%
Quality Assurance and Control	6%	4%	4%	7%	12%	7%	6%
Calibration	4%	1%	3%	-	2%	5%	34%
Computerized Maintenance Management System (CMMS)	2%	7%	4%	2%	2%	5%	134%
Engineering Support	1%	-	-	1%	1%	5%	835%
Forklift Operation	1%	4%	2%	2%	-	5%	835%
Nondestructive Testing (NDT)	-	-	-	-	-	5%	-
Post Trip Inspections	-	-	3%	3%	2%	5%	-
Sales	3%	10%	5%	8%	8%	5%	87%
Boilers	1%	2%	2%	4%	-	4%	251%
Chemical Engineering	1%	1%	-	-	-	4%	251%
Commissioning	9%	7%	9%	6%	7%	4%	-53%

Table 10. Skills Demand for NOC 225 (Technical occupations in architecture, drafting, surveying, geomatics and meteorology) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*27*	*13*	*59*	*16*	*29*	10	
AutoCAD	30%	46%	36%	25%	34%	40%	35%
3D Modeling / Design	4%	8%	8%	-	10%	20%	440%
Computer Aided Drafting/Design (CAD)	19%	-	8%	-	3%	20%	8%
Customer Service	-	-	-	6%	10%	20%	-
Engineering Design	30%	31%	32%	6%	7%	20%	-33%
Engineering Design and Installation	30%	31%	34%	6%	7%	20%	-33%
Engineering Drawings	-	8%	2%	13%	14%	20%	-
Microstation	-	-	15%	-	10%	20%	-
Piping Design	-	-	20%	6%	3%	20%	-
Project Management	4%	-	-	25%	10%	20%	440%
Scheduling	19%	-	12%	-	10%	20%	8%
ArcGIS	19%	31%	2%	13%	10%	10%	-46%
Architectural Standards	4%	-	-	-	-	10%	170%
Audio / Visual Knowledge	-	-	-	-	-	10%	-
Bill of Materials	-	8%	7%	-	-	10%	-
Budgeting	-	-	-	-	10%	10%	-
CADD	-	-	7%	-	-	10%	-
Calculation	-	8%	7%	13%	21%	10%	-
Civil 3D	4%	-	2%	-	7%	10%	170%
Cleaning	-	-	7%	6%	21%	10%	-
Client Base Retention	-	-	2%	-	-	10%	-
Communications Industry Knowledge	-	-	-	-	-	10%	-
Contract Drafting	-	-	-	-	3%	10%	-
Contract Preparation	30%	-	2%	-	3%	10%	-66%
Contractor Safety	-	-	-	-	-	10%	-

Table 11. Skills Demand for NOC 311 (Physicians, dentists and veterinarians) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*15*	*11*	*26*	*4*	*11*	14	
Dentistry	67%	64%	19%	50%	55%	71%	7%
Veterinary Medicine	20%	27%	8%	25%	27%	64%	221%
Optometry	20%	27%	8%	25%	27%	57%	186%
Surgery	7%	9%	8%	25%	18%	57%	757%
Animal Health	7%	-	4%	-	9%	43%	543%
Laboratory Testing	27%	9%	27%	-	9%	43%	61%
Manual Dexterity	33%	9%	-	-	18%	43%	29%
Euthanasia	7%	-	-	-	18%	36%	436%
Medical Diagnosis	7%	-	-	-	9%	36%	436%
Medication Prescription	13%	-	-	-	18%	36%	168%
Obstetrics	7%	-	-	-	18%	36%	436%
Wound Dressing	7%	-	-	-	18%	36%	436%
Dental Examination	13%	18%	-	-	27%	21%	61%
Dentures	33%	27%	-	-	18%	21%	-36%
Disease Control	-	-	-	-	-	21%	-
Disease Diagnosis	27%	27%	-	-	18%	21%	-20%
Family Medicine	7%	18%	4%	50%	-	21%	221%
Life Support	-	-	-	25%	-	21%	-
Mental Health	7%	-	31%	50%	-	21%	221%
Oral Hygiene	27%	18%	-	-	18%	21%	-20%
Oral Surgery	27%	27%	-	-	9%	21%	-20%
Patient/Family Education and Instruction	27%	18%	-	-	18%	21%	-20%
Periodontal Surgery	27%	27%	-	-	9%	21%	-20%
Staff Management	20%	9%	-	-	-	21%	7%
Government Regulations	-	-	-	-	-	14%	-

Table 12. Skills Demand for NOC 312 (Optometrists, chiropractors and other health diagnosing and treating professionals) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*10*	*15*	*40*	*10*	*14*	12	
Cardiopulmonary Resuscitation (CPR)	-	7%	25%	10%	29%	33%	-
Health Promotion Programs	-	33%	8%	30%	7%	25%	-
Life Support	-	7%	13%	-	-	25%	-
Mental Health	-	20%	20%	10%	14%	25%	-
Patient Evaluation	-	-	8%	-	14%	25%	-
Teaching	-	33%	8%	-	14%	25%	-
X-Rays	-	-	10%	10%	14%	25%	-
Advanced Cardiac Life Support (ACLS)	-	27%	8%	-	-	17%	-
Case Management	-	-	8%	30%	7%	17%	-
Critical Care	-	-	3%	30%	7%	17%	-
Dry Eye	-	7%	-	-	-	17%	-
Eye Care	40%	7%	5%	10%	-	17%	-58%
Health Problem Diagnosis	-	-	3%	30%	7%	17%	-
Laboratory Testing	-	-	3%	-	14%	17%	-
Occupational Health and Safety	-	7%	10%	40%	7%	17%	-
Optometry	80%	27%	33%	20%	-	17%	-79%
Patient Advisement	-	-	5%	10%	14%	17%	-
Patient Safety	-	-	-	-	-	17%	-
Primary Care	-	27%	13%	-	7%	17%	-
Program Development	-	27%	8%	-	7%	17%	-
Protocol Development	-	7%	3%	30%	7%	17%	-
Surveillance	-	-	5%	30%	7%	17%	-
Treatment Planning	-	-	3%	-	-	17%	-
Vision Therapy	-	-	28%	-	-	17%	-
Acute Care	-	-	5%	20%	-	8%	-

Table 13. Skills Demand for NOC 654 (Security guards and related security service occupations) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*148*	*76*	*99*	*114*	*206*	171	
Customer Service	41%	37%	28%	69%	82%	80%	93%
Two-Way Radio Operation	28%	9%	18%	14%	9%	42%	46%
Customer Contact	9%	7%	5%	7%	6%	27%	191%
Safety Codes	4%	-	4%	6%	3%	27%	564%
Healthcare Security	-	-	6%	22%	7%	25%	-
Security Patrol	9%	-	4%	6%	3%	22%	129%
Surveillance	9%	9%	18%	3%	24%	16%	86%
Data Integrity	4%	4%	3%	4%	3%	13%	232%
Onboarding	8%	5%	-	10%	31%	13%	66%
Request for Information (RFI)	14%	4%	4%	4%	3%	13%	0%
Heavy Industrial Project Experience	-	-	-	8%	17%	9%	-
Cardiopulmonary Resuscitation (CPR)	30%	36%	35%	25%	25%	9%	-71%
Prevention of Criminal Activity	4%	8%	10%	1%	4%	8%	102%
Security Experience	14%	9%	5%	2%	5%	8%	-46%
Medical Emergencies	-	4%	-	9%	2%	7%	-
Aviation Regulations	8%	7%	2%	1%	3%	6%	-28%
Loss Control / Prevention	23%	37%	33%	3%	5%	6%	-75%
Asset Protection	-	-	4%	3%	13%	5%	-
Patient Monitoring	2%	-	1%	3%	3%	5%	160%
Scheduling	5%	7%	3%	2%	5%	5%	-1%
Prevention of Unauthorized Entry	7%	-	4%	3%	5%	4%	-53%
Information Technology Industry Knowledge	-	-	-	1%	9%	3%	-
Retail Industry Knowledge	6%	7%	9%	11%	3%	2%	-62%
Crowd Control	2%	-	1%	1%	-	2%	-13%
Automation Systems	1%	-	-	-	-	1%	73%

Table 14. Skills Demand for NOC 728 (Masonry and plastering trades) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*28*	*26*	*28*	*21*	*14*	14	
Drywall	36%	35%	7%	38%	21%	29%	-20%
Concrete Finishing	21%	15%	46%	48%	36%	14%	-33%
Concrete Placement	18%	23%	39%	43%	36%	14%	-20%
Drywall Installation	14%	12%	7%	38%	14%	14%	0%
Joists	7%	4%	4%	19%	-	14%	100%
Occupational Health and Safety	7%	-	-	-	-	14%	100%
Power Tools	25%	27%	36%	57%	50%	14%	-43%
Repair	46%	31%	36%	52%	43%	14%	-69%
Ventilation	-	-	4%	5%	-	14%	-
Lathes	-	4%	-	-	-	7%	-
Masonry	11%	4%	7%	5%	14%	7%	-33%
Painting	7%	4%	-	5%	7%	7%	0%
Restoration Projects	-	-	-	-	-	7%	-

Table 15. Skills Demand for NOC 737 (Crane operators, drillers and blasters) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*41*	*23*	*22*	*24*	*37*	8	
Database Administration	-	-	-	4%	8%	25%	-
Fall Protection	-	-	5%	8%	46%	25%	-
Forklift Operation	15%	22%	9%	4%	16%	25%	71%
Global Positioning System (GPS)	-	-	-	4%	8%	25%	-
Operations Management	7%	-	5%	4%	8%	25%	242%
Quality Assurance and Control	-	-	-	4%	5%	25%	-
Repair	-	17%	-	8%	43%	25%	-
Soil Collection	-	-	-	4%	8%	25%	-
Soil Sampling	-	-	-	4%	5%	25%	-
Teradata DBA	-	-	-	4%	8%	25%	-
Commercial Driving	-	-	5%	-	32%	13%	-
Contract Review	-	-	-	-	-	13%	-
Crane Operation	12%	-	23%	25%	8%	13%	3%
Equipment Operation	-	4%	14%	13%	5%	13%	-
Industrial Engineering Industry Expertise	32%	-	5%	13%	5%	13%	-61%
Materials Transport	-	-	-	-	-	13%	-
Natural Resources	-	-	-	-	3%	13%	-
Occupational Health and Safety	-	-	-	-	3%	13%	-
Operating Engineering	-	-	-	-	5%	13%	-
Permanent Placement	-	-	-	-	5%	13%	-
Safety Training	17%	22%	23%	17%	22%	13%	-27%

Table 16. Skills Demand for NOC 744 (Other installers, repairers and servicers) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*23*	*22*	*29*	*28*	*45*	16	
Repair	65%	73%	45%	75%	73%	69%	5%
SAP	22%	36%	28%	46%	56%	31%	44%
Natural Gas	22%	23%	14%	29%	38%	25%	15%
Customer Service	13%	14%	14%	11%	2%	19%	44%
Machining	-	-	7%	7%	11%	19%	-
Safety Training	4%	-	-	4%	2%	19%	331%
Calibration	4%	5%	-	-	4%	13%	188%
Commercial Driving	-	-	-	-	-	13%	-
Commissioning	9%	5%	14%	-	-	13%	44%
Electrical Work	22%	36%	17%	43%	40%	13%	-43%
Forklift Operation	17%	5%	3%	-	2%	13%	-28%
Hand Tools	4%	5%	3%	-	2%	13%	188%
Legal Compliance	26%	36%	14%	43%	42%	13%	-52%
Machinery	22%	5%	7%	-	4%	13%	-43%
Personal Protective Equipment (PPE)	-	-	3%	-	2%	13%	-
Sales	-	-	-	-	2%	13%	-
Shipping and Receiving	-	5%	10%	11%	11%	13%	-
Animal Control	4%	5%	7%	-	4%	6%	44%
Automotive Painting	-	-	-	-	-	6%	-
Building Codes	-	-	-	-	-	6%	-
Cardiopulmonary Resuscitation (CPR)	-	-	-	-	-	6%	-
Client Base Retention	-	-	7%	-	-	6%	-
Customer Contact	9%	9%	-	-	-	6%	-28%
Data Entry	4%	-	-	-	-	6%	44%
Detection and Measurement Equipment	-	5%	-	-	-	6%	-

Table 17. Skills Demand for NOC 921 (Supervisors, processing and manufacturing occupations) roles in northern Alberta, 2015 to 2020, descending order by 2020 %, Labor Insight™

Skill	2015	2016	2017	2018	2019	2020	Growth 2015-2020
n	*31*	*25*	*47*	*49*	*39*	44	
Facebook	-	-	-	-	-	48%	-
Supervisory Skills	19%	32%	30%	18%	31%	45%	135%
Industrial Engineering Industry Expertise	3%	16%	11%	18%	15%	23%	605%
Scheduling	16%	28%	36%	14%	38%	20%	27%
Budgeting	23%	16%	19%	12%	18%	18%	-19%
Manufacturing Processes	-	-	-	-	10%	18%	-
Industrial Equipment Industry Knowledge	-	8%	6%	4%	5%	16%	-
Industrial Production	-	8%	6%	4%	5%	16%	-
SAP	3%	12%	6%	4%	-	16%	393%
Safety Training	3%	4%	2%	2%	3%	14%	323%
Conflict Management	3%	12%	4%	14%	8%	11%	252%
Cost Analysis	-	-	-	4%	5%	11%	-
Procurement	-	4%	13%	12%	13%	11%	-
Purchasing	13%	8%	2%	2%	3%	11%	-12%
Quality Management	3%	-	17%	8%	10%	11%	252%
Agribusiness	-	-	-	4%	8%	9%	-
Key Performance Indicators (KPIs)	-	20%	6%	-	8%	9%	-
Machinery	3%	12%	2%	4%	8%	9%	182%
Mechanical Engineering	3%	4%	13%	6%	28%	9%	182%
Mechanical Maintenance	3%	4%	4%	-	3%	9%	182%
Occupational Health and Safety	-	-	4%	6%	15%	9%	-
Performance Management	3%	8%	11%	10%	15%	9%	182%
Predictive / Preventative Maintenance	6%	4%	2%	-	5%	9%	41%
Process Equipment	-	4%	-	-	-	9%	-
Root Cause Analysis	-	-	-	-	3%	9%	-

APPENDIX C: INTERVIEW GUIDES

INTERVIEW GUIDE – INSTITUTIONS

This interview is part of a research project being conducted by a group of postsecondary institutions in Alberta. The research aims to investigate the role that micro-credentials could have in meeting future skills gap needs in the northern Alberta region.

Background and Initial Awareness and Perceptions

1. Before we begin, can you tell me about yourself and your role at your institution?

2. Have you heard the term "micro-credential", before this interview?
    a. If yes, what do you understand micro-credential to mean?
    b. If no, provide our working definition and ask "What are your initial perceptions of micro-credentials?"

Institutional Information

For the purposes of this interview, our working definition of micro-credentials is as follows:

Micro-credentials are awarded upon the successful completion of an assessment of a particular skill or competency, associated with short, specific and focused training, and are designed to be beneficial in obtaining employment or meeting on-the-job educational requirements.

For the remainder of this interview, please consider this definition as we move through the questions.

3. Does your institution offer micro-credentials?

If yes:

4. In what areas does your institution offer micro-credentials (e.g. what program areas)?

5. Are the micro-credentials offered for-credit?

6. Are micro-credentials offered as part of recognized/funded activity or are they funded through special grants or student-funded?

7. Do you consider certificate programs to be micro-credentials or are certificates distinct from micro-credentials?

8. What award or recognition document is received by students (e.g. digital badge, certificate of completion, etc?)

9. Are any of your micro-credentials recognized by an industry association?

10. When were micro-credentials first introduced at your institution?
    a. What was the driver behind this decision?

11. What challenges has your institution experienced, if any, with micro-credentials?
    a. Probe : Barriers to delivery (i.e. access, cost, time, perception, professional standards)

12. What are some of the benefits of having micro-credential offerings, in your view?

13. How have employers responded to the micro-credentials you offer? What information or verification/authentication have they asked for regarding micro-credentials?

If no:

14. Are there plans to introduce micro-credentials at your institution?
    a. What are the drivers behind that decision?

15. Do you think your institution and its students would benefit from offering micro-credentials?

Further Perceptions of Micro-Credentials

16. In your opinion, how valuable are micro-credentials? Do you think students recognize them as valuable? What about employers?

17. What are your concerns, if any, about micro-credentials?

18. What are some benefits of micro-credentials? To the institution? To students? To employers?

19. What types of skills do you think are best suited for micro-credentials?
    a. Probe: technical, soft skills, industry-specific, etc.

20. Are you aware of any institutions that are offering micro-credentials in a particularly successful way?

21. What do you see on the horizon in terms of micro-credentials at your institution, in the province, and the PSE sector as a whole?

INTERVIEW GUIDE – EMPLOYERS

This interview is part of a research project being conducted by a group of postsecondary institutions in Alberta. The research aims to investigate the role that micro-credentials could have in meeting future skills gap needs in the northern Alberta region.

Background and Initial Awareness and Perceptions

1. Before we begin, can you tell me about yourself and your role at your organization?

2. Have you heard the term "micro-credential", before this interview?
   a. If yes, what do you understand micro-credential to mean?
   b. If no, provide our working definition and ask "What are your initial perceptions of micro-credentials?

Perceptions of Micro-Credentials

For the purposes of this interview, our working definition of micro-credentials is as follows:

Micro-credentials are awarded upon the successful completion of an assessment of a particular skill or competency, associated with short, specific and focused training, and are designed to be beneficial in obtaining employment or meeting on-the-job educational requirements.

For the remainder of this interview, please consider this definition as we move through the questions.

3. Does your company currently partner with an external organization or postsecondary institution to offer micro-credentials for professional development for employees?

4. In your opinion, how valuable are micro-credentials? As an employer, do you place value on them when seeing them on a resume?

5. Do you/would you consider micro-credentials when hiring a new employee?

6. What information do you need to know about a micro-credential in order to consider it when hiring or promoting an employee?
   a. E.g. Delivery method, time to completion, assessment, how to authenticate/confirm

7. What are your concerns, if any, about micro-credentials?

8. What types of skills do you think are best suited for micro-credentials?
    a. Probe: technical, soft skills, industry-specific, etc.

9. Are there specific skills within your organization or company that might lend themselves to short, specific and focused training to gain a particular skill or competency?

10. Would you consider supporting an employee to pursue short, specific and focused training to gain a particular skill or competency?
    a. In what ways? E.g. time off, reimbursement for course costs, etc.

11. What could institutions do to make micro-credentials better fit employer needs?

APPENDIX D: LEARN PARTICIPANTS WORKSHOP

January 22, 2021, 9:30 am to 11:00 am MST

After receiving the first draft of this report and an overview presentation one week prior (on January 15, 2021), the LEARN partner representatives and invited attendees participated in a workshop to discuss themes arising from the report. The main objectives of this workshop were to:

- o Refine themes revealed in research;

- o Understand how the LEARN members want to use the research from this project; and

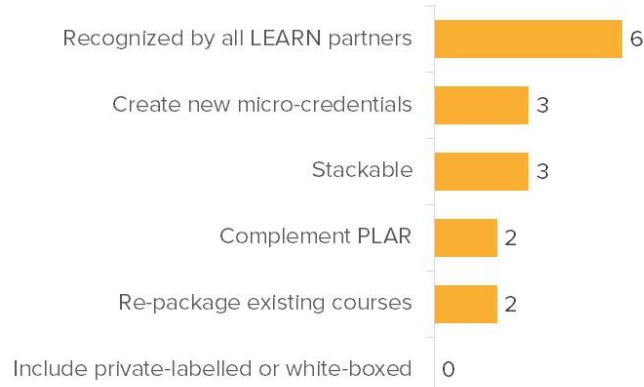- o Provide further focus for developing recommendations.

The following polls questions were used to engage participants, gain their feedback and prompt discussion of the research themes. It should be noted that the LEARN partner institutions were not equally represented in the participant numbers and participants responded based on their individual opinions and did not necessarily represent their institutional viewpoints. This information and the ensuing discussion helped to shape analysis and recommendations in this report.

Which of the following components of the micro-credential definition are the most important for the LEARN partners when forming their own working definition? (Select 2)

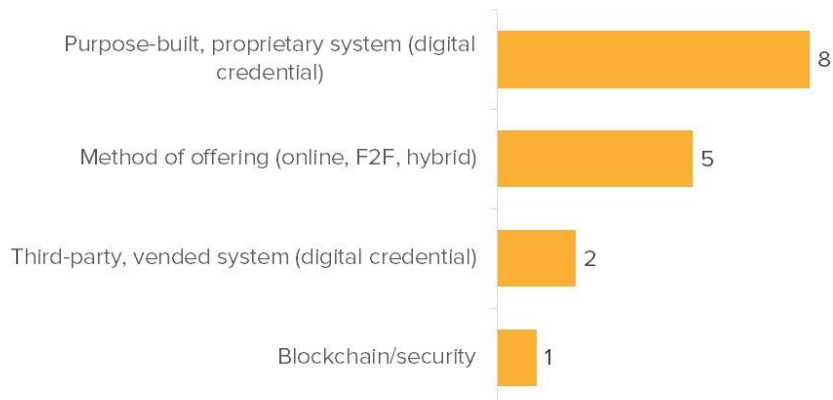| Component	Count
Specific skill or competency identified	11
Assessment	6
Related to employment (re-skilling or up-skilling)	5
Quality assurance	5
Time constrained	2
Complement other credential	1

1

Which of the following components of the micro-credential frameworks are the most important for the LEARN partners to consider as a first step? (Select 2)

Component	Count
Recognized by all LEARN partners	6
Create new micro-credentials	3
Stackable	3
Complement PLAR	2
Re-package existing courses	2
Include private-labelled or white-boxed	0

2

Which of the following technical considerations are a top priority for the LEARN partners? (Select I)

Consideration	Count
Purpose-built, proprietary system (digital credential)	8
Method of offering (online, F2F, hybrid)	5
Third-party, vended system (digital credential)	2
Blockchain/security	1

3

Should the LEARN partner institutions develop new micro-credential offerings based on: (Select 2)

Category	Value
In-demand job/employer demand	10
In-demand skills	9
Anticipated growth areas	8
Institutional areas of expertise	2
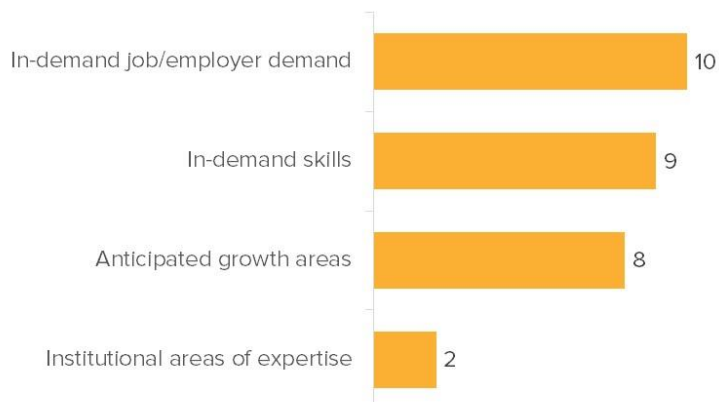
4

Which aspects of accessibility and demand are a priority for the LEARN partners? (Select 2)

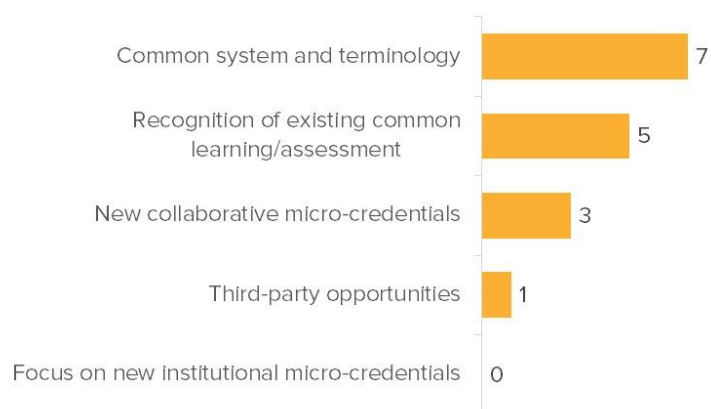| Category	Value
Increasing accessibility for northern/rural communities	14
Increasing accessibility for Indigenous communities	7
Increasing fully online micro-credentials	5
Offering completely new micro-credentials	1
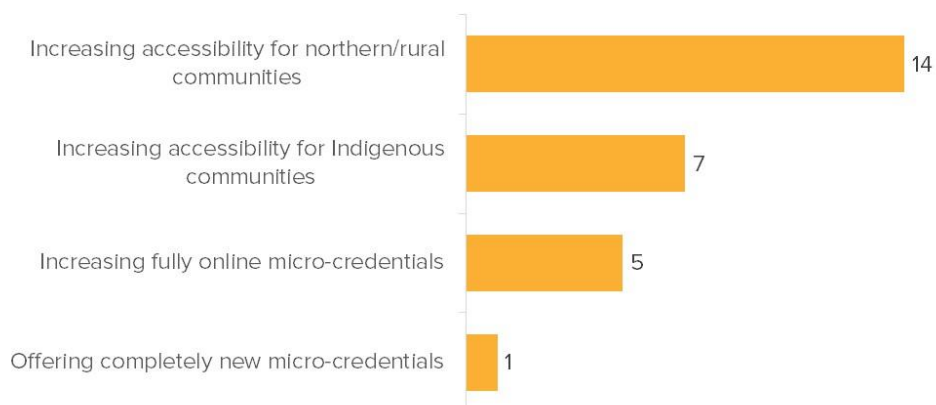
5

Which of the following program areas should the LEARN partners prioritize when developing micro-credentials? (Select 3)

Program Area	Count
Soft Skills	12
Health care	11
Business	9
IT	7
Trades	5
Personal Interest	2
Other	1
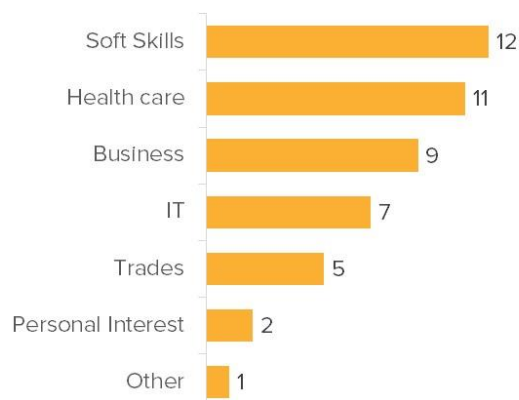
6

Which collaboration opportunity would be your highest priority? (Select 1)

Collaboration Opportunity	Count
Common system and terminology	7
Recognition of existing common learning/assessment	5
New collaborative micro-credentials	3
Third-party opportunities	1
Focus on new institutional micro-credentials	0

7